



Mainstreaming Climate Change Adaptation in Drylands Development Planning in Tanzania

Stakeholders' Workshop, Equator Hotel, Arusha

25 - 27 January 2012



Jumuiko la Maliasili Tanzania

Tanzania Natural Resource Forum



International Institute
for Environment
and Development

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Acronyms

ASALS	Arid and Semi-Arid Lands
CCIAM	Climate Change Impacts, Adaptation and Mitigation
CCCG	Climate Change Coordinating Group
IIED	International Institute for Environment and Development
IUCN	International Union for the Conservation of Nature
LAPA	Local Adaptation Plan of Action
LGA	Local Government Authority
MEMR	Ministry of Environment and Mineral Resources
MLFD	Ministry of Livestock and Fisheries Development
MSTCDC	Mellemfolkelligt Samvirke Training Centre for Development Cooperation
NAPA	National Adaptation Programme of Action
NCCSAP	National Climate Change Strategy and Action Plan
NCCRS	National Climate Responses Strategy-Kenya
PMO RALG	Prime Minister's Office Regional Administration and Local Government
PMO	Prime Minister's Office
TMA	Tanzania Meteorological Agency
TNRF	Tanzania Natural Resource Forum
VPO	Vice President's Office

Introduction

TNRF and IIED, with support from UKAID, are implementing a new programme to mainstream climate change adaption in drylands development planning in Tanzania. The two organizations have already worked with Longido District in designing and testing approaches and mechanisms that will strengthen institutional capacity for adaptive management of Tanzania's arid lands. Lessons from Longido, which include participatory action research and capacity building, will be scaled-up in this project in the districts of Longido, Monduli and Ngorongoro in northern Tanzania.

Box 1: Workshop objectives

Overall objective:

To mainstream climate change adaptation in drylands development planning in Tanzania

Specific objectives:

- Present and discuss project's 1-year preparatory phase
- Share information & build understanding on:
 - *Tanzania's climate change strategy and actions;*
 - *Services provided by the Tanzania Meteorological Agency;*
 - *Climate change projections for northern Tanzania;*
 - *District and community experiences of climate change;*
 - *Other experiences from Tanzania, Kenya and Nepal.*
- Identify how project learning is used to inform Tanzania's national climate strategy and plan of action

This project, which starts off with a one-year preparatory phase, will adopt an iterative and participatory learning approach through the establishment of three district-level consultative and learning groups on climate change adaptation.

This document reports back on the proceedings of the inception workshop attended by 68 participants, composed of community members, local leaders, civil society actors, international institutions, local and national level government officers and representatives from research organisations.¹ The agenda included presentations on Tanzania's climate change strategy, services of Tanzania's meteorological department, downscaled climate change projections for Northern Tanzania, district and community experiences of climate change, experience from elsewhere in Tanzania, Kenya, Nepal and technologies that may be useful for learning. On the final day, a project planning meeting comprised of a small technical committee was held in order to discuss and plan the next steps launching the project into the one-year preparatory phase.²

Box 2: the importance of pastoralism and subsistence farming

"...our pastoral communities support themselves, and provide approximately 90% of the milk and meat we consume in our towns and cities. This is critical for our national food security. Further, the supply chain in pastoral products, such as meat and milk, also contributes financially to livelihoods around the country. It is estimated that the livestock sector contributes nearly 30% of agricultural GDP at the national level"

(Regional Commissioner's speech)

¹ Annex 1 contains the list of participants

² Annex 2 contains the workshop agenda

Workshop proceedings

Session 1: Opening the workshop

Alais Morindat, Program Coordinator and workshop convenor, welcomed participants and emphasized the need to identify how project learning can inform Tanzania's Climate Change strategy and plan for action. Next Hon. Magesa Mulongo, the Regional Commissioner for Arusha, opened the workshop with a speech. The speech highlighted the following:³

- Tanzania has an added development challenge: climate change.
- Significance of empowerment and participation of local institutions in development processes as reflected in national policies for planning and sustainable development⁴
- Need to mainstream climate related data sufficiently into the formal planning process
- Need for district development plans to focus more on addressing climate variability and change and incorporating risk mitigation and adaptation strategies
- Climate change poses challenges but also opportunities to build Tanzania's adaptive capacity and implement green economy-type investments that promote sustainable growth
- National policies must learn about and support existing pastoralist production systems in the arid and semi-arid lands of Tanzania

Session 2: Project overview⁵

Presented by Ced Hesse, IIED.

The issues for northern Tanzania

Pastoralists and agro-pastoralists have always lived with variability and uncertainty, and have developed institutions and tools to deal with unpredictability. These strategies are no longer as effective as they used to be because of:

- Loss of key natural resources, reduced mobility
- Weak voice, especially in planning;
- Traditional institutions not strongly linked to government institutions
- Government & traditional planning not complementing each other
- Climate is not integrated into formal government planning

The Government of Tanzania has recognised the imperative of adapting to climate change through improved planning. This project, through action-research in three dryland districts, will pilot various approaches where lessons will be scaled up in a subsequent phase. What is certain is that *business as usual will not work*. New institutional frameworks and decision-making processes that promote and support adaptive management approaches need to be developed (see Annex 5 Project objectives and activities).

Box 3: Development deficit in drylands

Dryland areas have historically been perceived as low potential areas. As a result, they have attracted less investment and are as such often less developed. This 'development deficit' means that people in drylands will be hit sooner and harder with increasing climate variability.

Questions/comments (in bold) and answers:

The one-year start-up period is too long, particularly for Longido who, after 3 years, are ready to move onto the next phase. We can't afford to wait that long. The experiences from Longido can be used to inform other districts on best practice. The big job now is building the structure that will allow this project to take off. It is important that all three districts launch the project at the same time.

³ Annex 3 contains the Regional Commissioner's speech.

⁴ E.g. The National Strategy for Growth and the Reduction of Poverty (MKUKUTA) and Vision 2025

⁵ See annex 5

The national government is committed to addressing adaptation, but it is convinced that the work and action specification has to be at District level using existing resources. 'Decentralisation by devolution of power' is one of the key principles of this project which is in line with national strategies.

Will there be delays with regards to funding? Funds have already been released for this first phase and so there is no delay. Funds will not be administered through central government authorities such as the Ministry of Finance, but through TNRF. An objective of the 1st year is to secure funding for the following phases.

Will councils have the freedom to voice their opinions and will they be heard? Participation is the basis of this project and so all stakeholders opinions are valued and will help inform the implementation of the project.

The experiences gained from this project may serve as a model of how to work locally and nationally with climate change adaptation. If documented well, this model can be scaled up or used for inspiration elsewhere.

Session 3: Presentations on future downscaled climate change projections in Tanzania and the role of TMA in the context of climate variability and change

Presented by Victor Orindi, IIED.

While reports for northern Tanzania suggest evidence of increased variability and unpredictability, the available data is not conclusive and it is not possible to know exactly what effect climate change will have on Tanzania.

In the context of this uncertainty, it would be useful if more work is directed into understanding thresholds of different animals and the environment as to better understand the possible impact. For example, what is the maximum temperature for livestock well-being?

However, what is evident is that people are surviving these variations. How are they surviving and what can be learnt from the strategies they employ is still one of the things we hope to learn from this project. More learning is required on adaptation to these variabilities. Systems must be built to deal with current experience and identify measures that can help deal with current risks. In order to do this, the various organisations and institutions (e.g. traditional, local, national and international) need to work closer together. One of the key recommendations to take from this presentation is that integration of local knowledge with external projections is crucial.

Tanzania Meteorological Agency's role in climate change adaptation is to provide:

- Weather and climate monitoring and prediction.
- Provision of early warning information on impending hydro meteorological related disasters.
- Education and climate change awareness.

Enhancing surface and upper air observations for comprehensive monitoring of weather and climate is one of the challenges TMA faces. Additionally, the lack of central forecasting station and high cost of running weather stations hinders installation of some

Box 4: From coping to adapting

"...coping strategies are risk avoiding- they mitigate against disasters in bad years but fail to exploit better years and hence present a lost opportunity. Households survive but remain poor and vulnerable to climate variability and change - just coping is not enough for Africa's rural poor. They need to build their livelihood resilience and adaptive capacity if they are to have any hope of successful adaptation to future climate change.

Uncertainty is a key factor in climate change projections. But do we wait and see? Or do we need to act?"

Viktor Orindi, IIED Kenya

meteorological equipment. There is a need to enhance dissemination of weather and climate information to reach end users, even in remote areas. Underlying all these issues is the financial constraints TMAs face.

Discussion:

Amongst several comments from the audience was the view that TMA services tend to focus on the urban/industrial sectors. More generally, information dissemination to non-specialists is weak below the District level.

TMA claims to be so starved of funds that they can't even produce national-level forecasts (there is only one upper air station in the country) let alone reach down to local data networks. Linking TMA to schools at village level could be a way of obtaining local data sources.

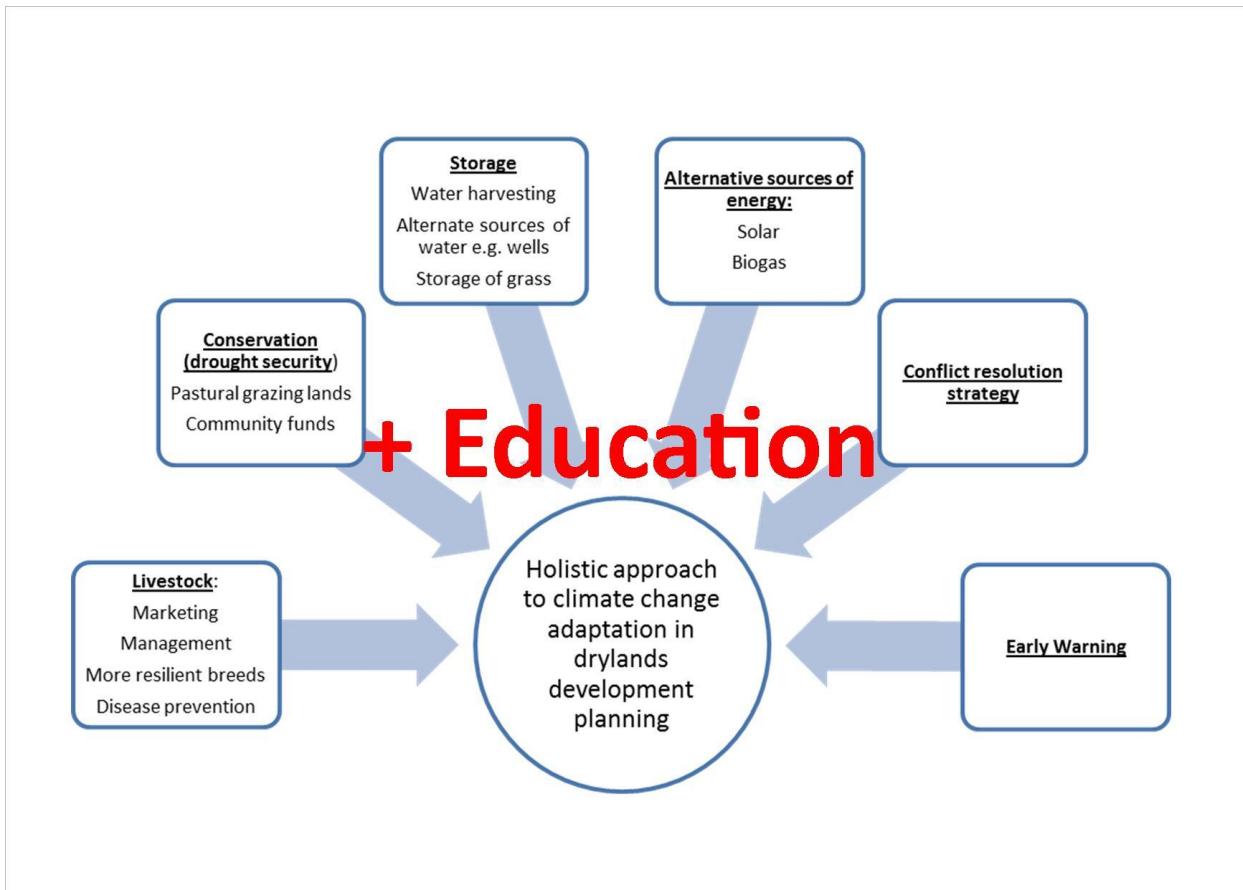
One of the issues raised was community members' distrust of forecasting services. When weather forecasts indicated that the rains would be minimal in 2009, people did not receive adequate information or did not trust it and hence did not take precautions. Consequently, people suffered huge losses in livestock and crops due to the severe droughts. Had there been a closer connection between weather forecasting, disseminating this information, and people's awareness and trust in forecasting services, livestock could have been sold off while the market was still good. This is an approach to avert risk and adapt.

Session 4: District/community experiences on climate change

Following on from showing the film, 'Voices of the People,' Longido, Monduli and Ngorongoro district representatives shared their experiences on climate change. These were the challenges experienced by all three districts:

- Rainfall patterns have changed, less rainfall – every year has drought, longer droughts
- Increase in temperature since the 1960s
- Reduced water resources - water sources have changed course
- Conflict over resources rising
- Human and stock diseases are increasing- e.g. increase in malaria
- Wildlife is reducing in the area
- Invasive tree and pasture species are reducing the value of the pasture
- Trees are desiccating; the desert is marching
- Floods are now experienced in areas where there was no flooding
- Reduced productivity of crops, pastures
- Not enough fodder for livestock
- Vulnerability due to climate change has led to increased poaching incidents
- People are beginning to move into towns/cities to avoid risk

Figure 1: Climate change adaptation strategies: recommendations from three Districts⁶:



In terms of creating an infrastructure for marketing and managing livestock, Longido District representatives suggested setting up a Pastoralist Cooperative Union to identify a proper market for livestock and provide loans.

Climate change is creating conflict between different sectors. Districts face the additional challenge of the government (chairman/village leaders) giving out titles without consulting seniors. Development therefore has added to resource conflict in the re-allocation of land reducing pastoralist mobility which is a key strategy in climate change adaptation. A conflict resolution strategy is needed, and this may draw on local mapping or other evidence. The Longido MP suggests:

- Community maps with farming (cropped) areas
- Livestock corridors
- Water points
- Dry season and wet season pasture

Session 5: Tanzania Draft National Climate Change Strategy and Action Plan

Presented by Climate Change Desk Officer, Ladislaus Kyaruzi, VPO.

The strategy produces nationally-based guidance on climate change adaptation and mitigation by and across all stakeholders. The strategy is linked up to existing international framework, Vision 2025 and national as well as cross sectoral and sectoral policies in the country.⁷ One of the key challenges of the NCCSAP is how to address climate change while tackling related developmental issues, especially poverty reduction.⁸

⁶ Based on suggestions from each district, see annex 8 for details

⁷ See annex 9 for more details on specific objectives according to various sectors: water resources, coastal and marine environment, forestry, wildlife, agriculture and food security, human health, tourism, energy, industry, livestock, fisheries, infrastructure, human settlements, land use

⁸ Other challenges include poor infrastructure especially in rural areas , limited credit opportunities for rural communities, the impact of existing health stresses such as HIV/AIDS, limited capability of local personnel to effectively analyse the threats and potential impacts of climate change

Particularly relevant to this project was the NCCSAP objectives related to livestock.

Adaptation strategic objectives:

- 1) Promote climate change resiliency in livestock farming practices
- 2) Acquire appropriate technologies for livestock production systems

Mitigation strategic objectives:

- 1) Promote appropriate livestock management practices that reduce emissions
- 2) Promote use of improved animal feed

The strategy emphasized the importance of promoting research and development, enhancing information, communication, education and public awareness and building capacity and institutional strengthening.

Questions/comments (in bold) and answers:

There seems to be an apparent neglect of the complexities of impacts on the livestock sector in the NCCSAP. Please elaborate on how the NCCSAP looks at situational and more specific areas such as pastoralism and livestock. Pastoralism is one of the most vulnerable sectors and is therefore considered very important in the strategy. Once finalised, you will see it has been included in the institutional analysis. The government has used radio to analyse how the livestock sector is affected by climate change.

To what extent has the national strategy looked at the use of indigenous knowledge to influence strategy? As indicated in the presentation, the NCCSAP aims to promote indigenous knowledge and explore how to translate this into action plans. NCCSAP attach importance to indigenous knowledge; it is very much integral to the strategy.

There are issues that are more critical in particular areas of the country. It is not viable to apply the same strategies of adaptation and mitigation in all districts as these strategies must be adapted to the specific local context.

Session 6: Experiences from Kenya and Nepal

Victor Orindi⁹ presented experiences from Mainstreaming Climate Change in Kenya as a whole, followed by a more localised presentation on the experiences from the County of Isiolo by Daud Tari Abkula. Nanki Kaur (IIED) presented 'Mainstreaming climate change: experience from Nepal.'

6.1 Kenya

ASAL's in Kenya account for 80% of land - 38% of population, 70% of livestock and 90% of wildlife live in these areas. The challenges include aridity and variability, high levels of poverty, poor infrastructure, high cost of doing business, and weak coordination between initiatives, including development partners not involving local communities.

"What is mainstreaming? Mainstreaming is about getting it to the main stream- but also making sure the stream where you are going to is operating well"

The National Climate Change Response Strategy (NCCRS) of Kenya (2010) has helped form the basis for a Roadmap in Vision 2030 which includes:

- Public awareness/education
- Ministerial focus points and desk officers established
- Strengthened systematic observation networks
- Training of media
- Mapping climate change actors
- Climate Change (Donor) Coordination Group (CCCG)

⁹ Ministry of State for Development of Northern Kenya and Other Arid Lands, and IIED

- Restoration of water towers
- Climate Change Resource Centre to be established

Key Lessons

- Public education and awareness creation is crucial
- Coordination and harmony across government are critically important
- Adaptation is not all about technologies – you also need “software” (institutions, laws in place, incentives) as well
- Involve non-state actors throughout stages of strategy making, planning and action.
- Opportunities exist locally and nationally but you *must* have a policy and a plan in place to benefit from them.

The case of Isiolo

The purpose of the project is participatory with community-driven planning and implementation for climate change adaptation in the development of arid and semi-arid lands in Isiolo County, Kenya. It is a pilot project/experiment very similar to TNRF/IIED's project and presents an ideal opportunity for sharing experiences. Adaptive planning relies on local knowledge, adaptive practice and climate information. Devolution of power is the key. The project initiative therefore aims to support communities by building their capacity to articulate adaptive priorities rather than having them imposed from above. The County is now the key decision-making unit.

The county is comprised as follows:

- 1) Governor
- 2) Deputy
- 3) Technical Officers
- 4) County Assembly: (a) speakers (b) clarks (c) local representatives

Every region and livelihood system has its own issues and priorities, and these needs need to be taken into account in decision-making and implementation. Supporting the structures, rules and regulations governing customary institutions is key. Ultimately it's about governance.

Kenya Meteorological Department (KMD) has been involved in the early stages of the project and provides support in the form of seasonal forecasting. Use of radio to disseminate climate information and other developmental issues has been particularly useful.

Questions/comments (in bold) and answers:

This project deals with the victims of climate change, what about the culprits? The project is still in the early stages of implementation so we do not have the answers to these important questions. Influence, knowledge and skills all come into play but the project aims to ensure relationships between all actors remain open. This is critical to ensure that the activities identified by communities to build their adaptive capacity are supported.

How do we address the root causes of climate change? The key element in Kenya is the devolution of power down the planning system, which represents an astonishing opportunity. But the crucial element is to build capacity so that communities can effectively make decisions in collaboration with the existing formal system.

6.2 Nepal

The presentation on experiences from Nepal provided a more practical overview - what institutional frameworks and budgetary frameworks are needed in mainstreaming climate change. Generally, Nepal has identified three major pillars for mainstreaming climate change in planning process:

- **Enabling environment** (political framework, information services)
- **Planning framework** (everything involved in the development planning process - policy, legislation, regulation, budget, institutional structures)

- **Programmes** (capacity building, implementation)

The three pillars have enabled Nepal to develop the **Local Adaptation Plan for Action** (LAPA) Framework in December 2011. The plan was developed based on *bottom-up, inclusive, responsive and flexible* principles in order to capture the scale and magnitude of climate change adaptation. The Key elements in the LAPA design and process are:

- Institutional framework and arrangements
- Role of plural institutions (public, private, NGO, formal, informal)
- Scale - at what scale do you ensure that your bottom-up processes are reflected in the plans? While simultaneously supporting national plans?
- Budgetary framework- how do you channel funds when you want local/bottom up development? Base funding disbursement on performance? What funds are most accessible, responsive and transparent?
- Monitoring and evaluation framework
- Participatory framework to match supply and demand – shared dialogue, participatory cost-benefit analysis
- Support studies – analysis of the political economy (actors and networks); funding and budgetary process; legislation; capacity assessment

Questions/comments (in bold) and answers:

If we use solutions from USA or Japan to solve our climate change issues here in Tanzania or East Africa, it will not be successful.

Session 7: Resource mapping and new technologies¹⁰

7.1 Longido Experiences on Resource Mapping/Resource Management Plans

The primary strategic objective for Longido is to protect livestock keeping, as it is the dominant livelihood strategy in the district. In view of this, the district, with support from TNRF/IIED, have been conducting a participatory community-based pastoral resource mapping exercise to identify:

- Water – location of modern and customary water sources
- Pasture – dry and wet season
- Mobility – location of livestock routes to/from pasture and water

These community maps are now being digitized. The main reason is to use the maps to identify the key resources that sustain pastoralism in the district and thus need to be protected through district bylaws from encroachment and/or alienation. They can also be used to facilitate understanding between communities and government workers on how local people manage and use their resources in a sustainable way in response to climate variability.

Questions/comments (in bold) and answers:

SNV doing mapping of water points and would be interested in collaborating, perhaps mapping the facilities of livestock development. A forum for good resource mapping would be useful as many areas working on this and interested in collaborating.

Would map be the same if women were involved?

Mapping was wider and deeper than the presentation suggested- women and youth were all involved in mapping exercises.

¹⁰ There was also a slot for development partners, universities and NGOs to share their experiences but regrettably there was not enough time for these presentations. They can be found in annex 14.

Mobility is one of the components of resilience. How can a map capture mobility? We must obtain regular maps in order to capture mobility. We are only just establishing a baseline now- a start from which we can move into the future.

Pastoralists ARE the private sector! Once this is recognised – it is about reconciling of different private sectors. Some caution should be taken in manipulating the private sector as the aim of the project is not to support one particular private sector- benefitting one particular group. Therefore we need to work closely with other private sectors- in order to ensure good/diplomatic relations.

7.2 Experiences from the GeoData Institute¹¹

The way forward lies in applying local knowledge and data within local management structures and fuelling it with best practice and technology. GeoData Institute's approach is one of adaptive management whereby information and modelling are used to set targets and design appropriate management intervention. All of the data used are entirely open source (such as Google Earth, crowdsourcing, GIS¹²).

Technical approaches are employed within an information or broad knowledge management system. **Such information systems only work sustainably if four conditions are satisfied:**

1. Identify management need and demand
2. Work *within* existing management structure
3. There are *champions* in the stakeholder organisations with a real interest in the change (incentive)
4. Disseminated programmes essential (in the language/terminology/management culture of the user)

How can these technologies help within the context of this project? Tools, skills and governance can help make the move from knowledge to action. In its entirety, such an integrated approach offers a coherent basis for managing the complex tasks involved in managing pastoral and other economies in northern Tanzania through a combination of learning, knowing and acting.

Questions/comments (in bold) and answers:

How could we make the GeoData mapping techniques user friendly for the illiterate? Maps are useful as there is no real need to be literate. The challenge is to develop a way to communicate the information in the best way that pastoralists will understand.

Will these technologies really make a difference to these ground managers? As we heard yesterday, in 2009 warnings were given in Monduli but people did not listen! So how will these systems help? Early warning helps you to be resilient in dryland environments. E.g. sell cattle prior to severe droughts while the market is good. These systems will help if they are participatory.

Local knowledge, local priorities applied within the structures we are used to, will work. The

Box 6: GeoData on knowledge

Knowledge is a vital path for closing the gap between challenge and opportunity. It has huge power – without it we are blind, we cannot see today or reach out to make tomorrow better. But knowledge is nothing if it does not link to action: voices are nothing if no-one hears them. And in order to make these vital links we need to provide the tools, skills and governance (enabling environment) to transform data into information and then on through knowledge and understanding to decision and action.

Mike Clark, GeoData Institute

¹¹ See annex 13

¹² Geographical Information Systems

skill of the pastoralist combined with the technology will be a great asset, as technology allows them to use their own skills more effectively.

Can GeoData technology help in terms of conflict resolution? Yes. Technology provides a clearer idea of what the real facts are. Community based mapping brings people together in consultative forums and allows them to discuss/debate issues with the aim of learning to respect one another, and so can be seen as a process of peace building.

Concluding remarks:

The key aspect of this preparatory phase is to learn and to know in order to act. Learning together, with different approaches at different scales, and with the help of new technologies is going to be significant in the preparatory phase.

A number of questions arose during the workshop which are critical to the implementation of the project. How can information and approaches from Longido, Ngorongoro and Monduli be fed upwards to national level as a means of shared best practice? What are the mechanisms we need to put in place to ensure that learning is shared? Also how can the three Districts learn more about government thinking and progress elsewhere in Tanzania? How can the three Districts best share and learn together? Responses to these questions are explored in the following section session 8.

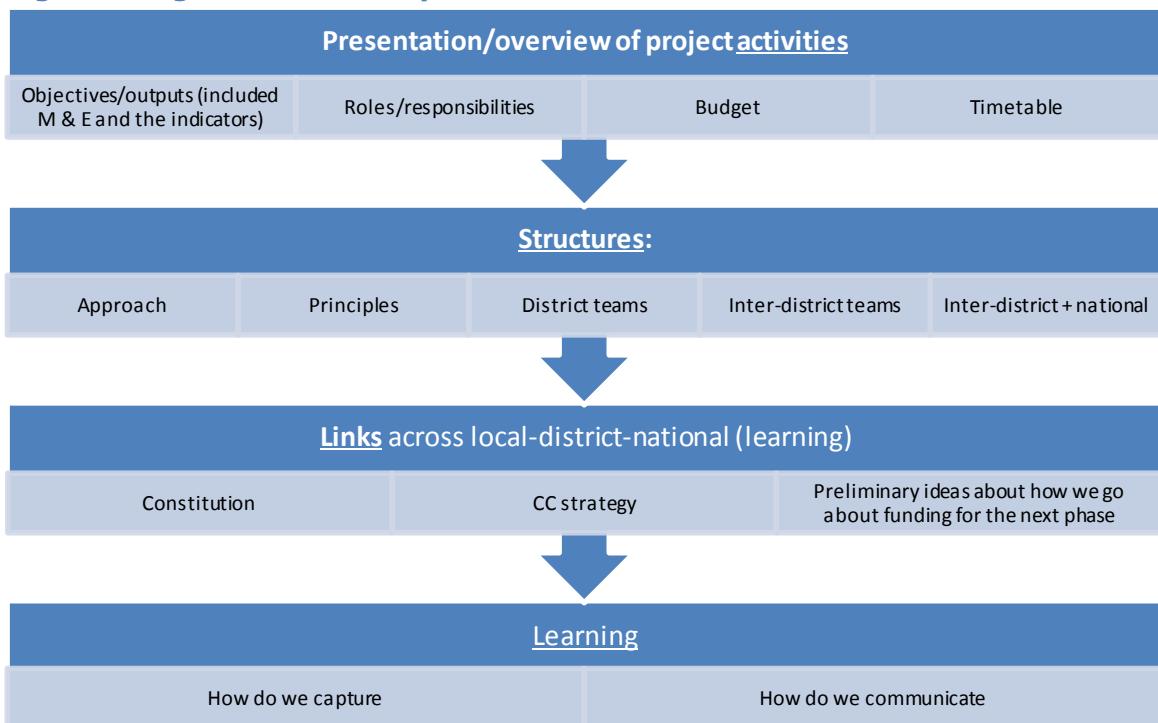
Box 7: Word of thanks from James Ole Millya District Commissioner for Longido and Jonica W. Kasunga District Commissioner for Monduli

Thanks to all participants for their engagement in this workshop. Let's remain focussed tomorrow and use the time well so that we can achieve results. To the ministries: please do not continue to let the districts stand-alone... let us speak the same language.

Session 8: Project planning meeting

The third day of the workshop was the project planning meeting, comprised of a small technical committee to discuss what should happen over the next 10 months. What is critical is that the Districts drive the process, taking the lead and responsibility for plans and actions. Those present included representatives from Ngorongoro, Monduli, Longido Districts, IIED and TNRF and a few others including PMO RALG, IUCN, AcT, CARE, SNV- Lavlak.

Figure 2: Agenda for the day¹³:



The overall role of the committee can be summarised as looking at **process**, strengthening **relations**, and importantly, working as a **Team** in order to achieve **Results**. The districts will need to identify leaders to navigate through these stages.

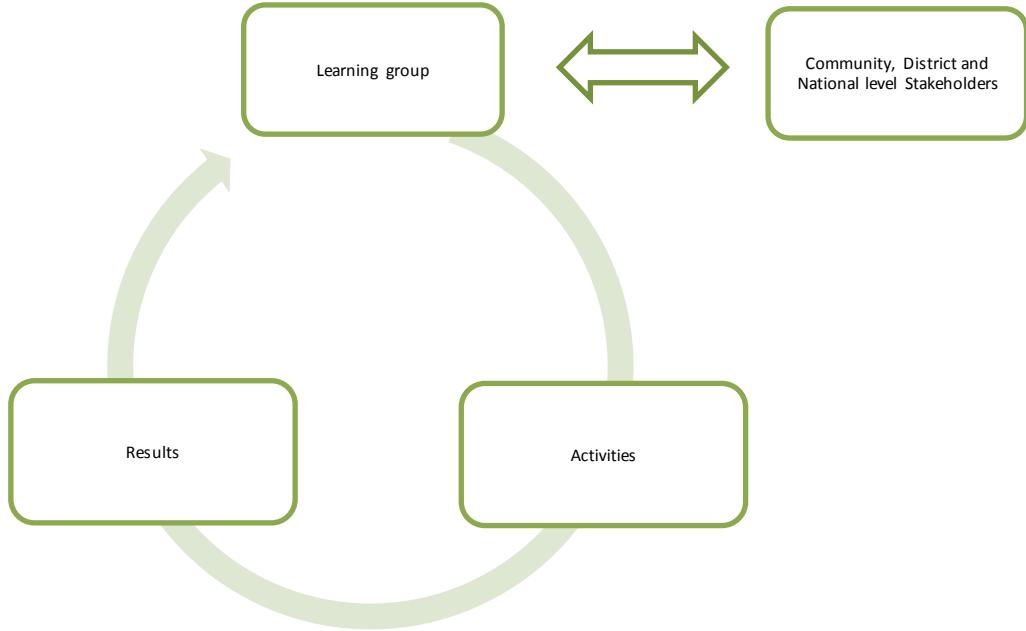
Intervention strategy- How are we going to work together, how are we going to put this project into operation? At this early stage we know that the strategy must involve all stakeholders and setting up a learning group at district level:

District level learning groups: “Timu Za Wilaya Za Kukabili Mabadiliko Ya Hali Ya Hewa Na Tabia-Nchi”

The learning groups will discuss and advise on activities that need to be carried out that will produce results, which feed back into the learning.

¹³ Drawn up by participants' expectations. A more detailed list can be found in annex 15

Figure 3: feedback mechanism in learning group



The teams should

- 1) Consider and include all opinions (also the weakest and most vulnerable)
- 2) Be of different levels with different specialization in activities
- 3) Every district to have their own team

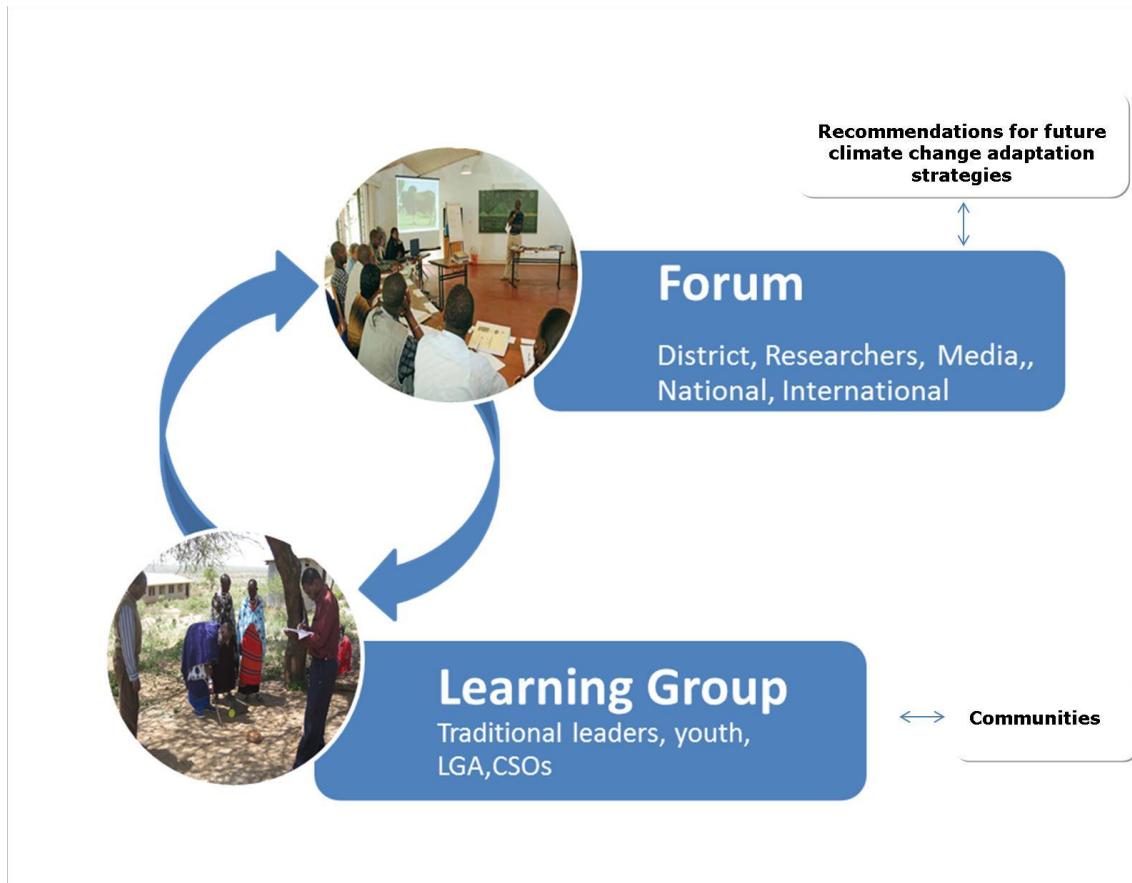
How will they work? The composition of the Learning Group should consider representatives from the District Councils, the DED, CSOs, traditional institutions (taking into account gender representation), youth, a leader of a livestock marketing cooperative, livestock department, customary leaders from local community and other important institutions such as Ngorongoro Conservation Area Authority (NCAA) or TANAPA.

There will be 15 people from each district, a total of 45 representatives from the three districts forming the learning group. Members of the learning group represent and feedback to their individual constituencies. In this way there is a feedback mechanism to ensure broader involvement.

As shown in the diagram below, learning at district level will be shared and communicated through the forum, which can provide recommendations on best practices for other stakeholders, and again feed back into the learning group and their constituencies. For the preparatory phase we will focus on the three districts, while feeding lessons into the national level. "We should act local, but think global," (Abdalla Jumanne, CCIAM¹⁴).

¹⁴ Sokoine University of Agriculture: Climate Change Impacts, Adaptation and Mitigation (CCIAM)

Figure 4: learning mechanism between district learning groups and forum



What next?

After the workshop, the districts have to go back and based on the criteria agreed on during the meeting, discuss and decide amongst themselves *who* should form the learning group. Learning groups will meet in Ngorongoro, Monduli and then Longido, with at least two representatives present from each of the three districts to discuss:

- Mandate
- Terms of reference of the learning group (how will it work)
- Activities
- Budget
- Number and frequency of meetings to be held
- Establishment of FORMAL links between the learning groups and institutions represented by the members of the group (the forum).
- How and to whom is the learning group accountable.
- Identify who is responsible for professional facilitation (debates, knowledge and learning that is facilitated needs to be captured)

1) Project Activities

	Activity	Notes	Budget (British Pounds) ¹⁵
1.	Inception meeting First planning meeting	<ul style="list-style-type: none"> • Completed • Completed 	

¹⁵ Remaining money to support TNRF staff engaged with this project. The Budget is not fixed, it is based on estimations. How it is distributed is flexible. However, any changes will need to go through the donor for approval.

2.	Set up district learning group	<ul style="list-style-type: none"> Name: "Timu Za Wilaya Za Kukabili Mabadiliko Ya Hali Ya Hewa Na Tabia-Nchi" Budget is flexible, likely to be more than what has been allocated so far 15 representatives from each district, totalling 45 members of the Learning Group 	7,300
3.	Training on Climate Change & the dynamics of livelihood systems in the three districts	<ul style="list-style-type: none"> Proposed two trainings per district, total of six trainings Building understanding about: <ul style="list-style-type: none"> - Climate change and links between local livelihoods and climate change - The role for the climate and its impact on the natural resources - The natural resources are what support the economy of the people and the districts 	57,000
4.	Study to understand how government planning and community planning works	<p>Two studies proposed:</p> <p>1) We know communities plan, but how do they plan? When does it take place? How effective is it? How do they take climate change into account? Long term or short term planning? What does adaptive planning really mean for communities?</p> <p>We want to ask the learning groups to help organise and define the terms of reference for those studies. Money for transport etc. is available.</p> <p>2) Study to look at the government planning process. How does it work, when is it done. How does it fit in with climate change? How does it plan for unexpected events?</p> <p>⇒ These studies come back to the learning group to share, discuss and plan on moving forward</p>	29,000
5.	National consultation and engagement travel budget	<ul style="list-style-type: none"> Meeting with government institutions - Budget to be decided and set aside for this 	
6.	Validation workshop	<p>Negotiation with the donors has already happened, funding secured, ready to launch. However, before this we have to:</p> <ul style="list-style-type: none"> Write the project document (needs a strong economic argument, need to see potential returns- funding already set aside to hire an economist as a consultant) Learning group meeting with TNRF and IIED Finally meeting with Donors <p>Fund-raising for the next phase starts from tomorrow! All before validation workshop.</p>	14,000

"Don't forget we learn by doing. So when we do, then we will be in a position to reflect and evaluate how sustainable what we are doing is and how to make it more sustainable if necessary. Sustainability will be born out of us 'doing,'" (Sitayo, TNRF).

To conclude, the next step is to set up district learning groups, then follow on with activities 3, 4, and 5 as outlined in the list of activities. From there we meet again for the validation workshop Nov/Dec 2012, and then launch into next phase of the project.

Session 9: Evaluation

The workshop closed with following feedback from participants:

Central Government

- **PMO:** *It's great to see such level of engagement from the workshop organisers but also from the participants particularly the District representatives. The challenge now is to find out how best to upscale experiences into other areas. I would like to acknowledge the importance of information sharing and transfer of best practice and would like to encourage you to attend several upcoming forums/conferences at a national level. The VPO would like to provide support in principle and practice.*
- **PMO RALG:** *It is important not to forget the people. Therefore pleased to see district representatives at the workshop. There are many things which have been brought up which would really help the ministry PMO RALG we are therefore very keen to continue close collaboration with all stakeholders involved in this exciting project. So please keep us informed.*
- **MLDF:** *This inception workshop has been an eye opener on climate change issues – I would like to leave you with an opportunity and a challenge. Forums such as this present a space where we can explore opportunities. And we are now leaving with a new challenge: we have the skills, and now we need to remain committed!*

Other stakeholders:

- **TMA:** *We thought the people have not understood the issues related to climate change. But through this workshop we've realised this is not the case. The main lesson learned: you cannot act without learning/knowing. We look forward to being involved with this project over the next year but also in the latter stages.*
- **MSTDC:** *Bringing together different people, with different areas of expertise. This project presents opportunities to work together to decide how to move forward with this project. It has been very participatory so far and highlighted the need for knowledge and information sharing. With regards to capacity building MSTCDC is ready to cooperate if given the opportunity.*

Local Government Authority:

- **Monduli District Council Chairman:** *With all this information sharing and learning there are big challenges ahead for the three districts. The world is changing very fast and we have no choice but to change with it.*

Annexes

Annex 1: List of Participants

Name	Organization
Abdalla Said Shah	IUCN
Abeid A.S Mushi	H/M Monduli
Agustine Kanemba	TMA
Alais Morindat	TNRF/IIED
Ally Msangi	Economist
Alphonse B. Mallya	TNC
Anense Kasaine	TAPHGO
Ashura Mohamed	Radio 5
Carolyn Kandusi	Pingos Forum
Ced Hesse	IIED
Charya John	DED Longido
Christopher John	UCRT
D.M Lopa	CARE TZ
Daoud Tari	RAP - Kenya
Dominic Lusasi	DED - Ngorongoro
Dr. J. M Abdalla	SUA
Dr. john Munyoli Musyoka	MSTCDC
Dr. Mashingo M.S.H	MLFD
E.N Sitayo	IIED
Edward Macra Ndallet	H/W Ngorongoro
Edward Sapunyu	Chairman - Monduli District Council
Elias Wawa Lali	DC Ngorongoro
Elirehema Matolo	RAS - Regional Administrative Secretary
Eng. Daudi E. Sebyiga	H/W Monduli
Eng. Ladislaus Kyaruzi	VPO
Geofrey Mwanjela	TNRF

Gilbert Rweyemamu	Mwananchi Com'tion Ltd
Happy Lazaro	Arusha Times
James K. Ole Millya	DC Longido
James Pattison	IIED
Jasephine S. Lemoyan	SNV
Jema Ngwale	Embassy of Denmark
Jessica Olsen	TNRF/IIED
Jessie Davie	TNRF
John Ngunge	JET
Jonica W. Kasunga	DC Monduli
Joseph Ole Sadira	Chairman - Longido District Council
Joseph Olila	TNRF
Joseph Rutabingwa	Economist - Monduli
Joyce Syokino	LCDO
Kahana Lukumbuzya	ACT/KPMG
Kaika S. Telele	MP - Ngorongoro
Kaiza Victor	Ngorongoro
Ladislaus Changa	TMA
Mathias	Longido
Michael L. Laizer	MP - Longido
Mohamed Ceda	Tanzama TZ
Nanki Kaur	IIED
Neema Hauba	EPMS
Ombeni Sangin	RAS - Regional Administrative Secretary
Paulo Kiteleki	Monduli Representative
Peter K. Metele	NPC
Peter R. Mushao	LOOCIP
Queen Lema	Business Times/Majira
Rashida Suleiman	TNRF
Rose Jackson	Jamboleo
Samuel K. Mutukaa	MSTCDC

Samuel T. Mlay	DED Monduli
Sanford Kway	PMORAH
Shija John	Sunrise Radio EA
Steven Kiruswa	LOOCIP
Suma Kaare	MSTCDC
Timothy Ole Yaile	PWC
Tom Ole Sikar	SNV
Tom Rowley	TNRF
Victor Orindi	MONKOAL, NRB
Zephania Ubwani	The Citizen

Annex 2: Workshop agenda

DAY 1: Wednesday 25th January 2012

8 a.m. – 9 a.m.	Registration	
9 a.m. – 10 a.m.	Official opening of workshop	
	Welcome speech	Honorable Regional Commissioner
	Word of thanks	District Commissioner
	Photographs with Honorable Regional Commissioner, Delegates, all participants	
10 a.m. – 10.30 a.m.	Tea/Coffee	
10.30 a.m. – 11.30 a.m.	Introduction	
	Participant introductions	TNRF and IIED
	Workshop Objectives	
	Workshop Timetable	
	Project Overview	
	Comments and Questions	
11.30 a.m. – 1 p.m..	Future Downscaled Climate Change Projections	IIED
	Comments and Questions	Tanzania Meteorological Agency (TMA)
	Tanzanian Forecasting Services	
	Comments and Questions	
1 p.m. – 2 p.m.	Lunch	
2 p.m. – 4.30 p.m.	District/Community Experiences on Climate Change	
	DVD Show	
	Districts Longido, Ngorongoro, Monduli	
4.30 p.m. – 5 p.m.	Recap/Closure	

7 p.m.- onwards	Dinner and Cocktails at Equator Hotel
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End of Day 1

DAY 2: Thursday 26th January 2012

8.30 a.m. – 9 a.m.	Recap of Day 1
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9 a.m. – 11 a.m.	Tanzania's National Climate Change Strategy Questions and Comments	Vice-President's Office
	Experiences from Kenya and Nepal Questions and Comments	Ministry of State for Development of Northern Kenya and Other Arid Lands / IIED

11 a.m. – 11.30 a.m.	Tea/Coffee
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11.30 a.m. – 1. p.m.	Longido Experiences on Resource Mapping/Resource Management Plans Questions and Comments	Tom Rowley (TNRF)
	Experience from the GeoData Institute Questions and Comments	GeoData Institute

Donor/University/NGO experience

1 p.m. – 2 p.m.	Lunch
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2 p.m. – 3.30 p.m.	The way forward (planning)
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3.30 p.m. – 4.00 p.m.	Tea/Coffee
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4 p.m.- 5 p.m.

Summaries/Conclusion

**End of Day 2 and close of
Inception Workshop**

Annex 3: Opening speech by Regional Commissioner

Inception workshop for mainstreaming climate change adaptation in drylands development planning project in Tanzania, Arusha, January 25, 2012

Distinguished guests, ladies and gentlemen,

It is with pleasure that I welcome you to this important inception workshop, which marks the launch of the inception period for the project known as, "mainstreaming climate change adaptation in drylands development planning in Tanzania". The workshop has been organised by the Tanzania Natural Resource Forum and the International Institute of Environment and Development.

Tanzania's national policies for planning and sustainable development, such as The National Strategy for Growth and the Reduction of Poverty (MKUKUTA) and Vision 2025, recognize the importance of local participation in development processes. Additionally, such strategies identify small-scale farming and pastoralism as sustainable livelihoods, and they call for empowering farmers and pastoralists to help improve agricultural and livestock productivity and to efficiently utilize rangelands.

These developments, as well as the process of local government reform that is underway in Tanzania, are significant steps for a vast number of Tanzanian communities. But these days, development in Tanzania has an added challenge: climate change. Current climate observations show rising temperatures, changing and shifting rainfall patterns and shrinking water resources. This increased climatic variability has significantly affected local livelihoods, and it needs to be better planned for as it will only continue to threaten livelihoods in Tanzania. Yet, the wealth of climate related data that has been and is collected by government institutions and others, has not yet been sufficiently mainstreamed into the formal planning process. District development plans do not sufficiently address climate variability or change and they don't yet adequately incorporate risk mitigation or adaptation strategies.

However, the challenges climate change poses can also be seen as an opportunity in which Tanzania can build its adaptive capacity and implement green economy type investments that will promote sustainable growth in line with national development strategies. As Tanzania addresses climate change, it is essential it recognize that impacts will be disproportionate, and with drylands, this is especially important to recognize. However, much like climate change can provide opportunities at the national level, there are huge opportunities in the drylands as well.

We cannot over-emphasise the importance of pastoralism and subsistence farming to local livelihoods and Tanzania's national economy. For example, our pastoral communities support themselves, and provide approximately 90% of the milk and meat we consume in our towns and cities. This is critical for our national food security. Further, the supply chain

in pastoral products, such as meat and milk, also contributes financially to livelihoods around the country. It is estimated that the livestock sector contributes nearly 30% of agricultural GDP at the national level. It is time that national policies internalize this significant contribution to our food security and the economy by learning about and supporting existing pastoralist production systems.

With a new focus on decentralization, empowering local government and communities, building adaptive capacity at the district and community level will be critical to future social and economic development of Tanzania. Of course, this raises many challenges, such as mainstreaming climate change into development planning, building community voices to engage in an informed way with their local governments, and streamlining national, local and community level planning processes.

This inception workshop and this project is a step at addressing some of these many challenges. It will require a great deal of support and cooperation from a variety of stakeholders, and it is exciting to see participation and collaboration is already beginning.

With these words, I wish you a successful workshop.

Thank you.

Annex 4: Project Objectives

IIED presented by Ced Hesse

Mainstreaming climate change adaptation in drylands development planning in Tanzania

Inception Workshop Objectives

- Present and discuss project's 1-year preparatory phase
- Share information & build understanding on:
 - *Tanzania's climate change strategy and actions;*
 - *Services provided by the Tanzania Meteorological Agency;*
 - *Climate change projections for northern Tanzania;*
 - *District and community experiences of climate change;*
 - *Other experiences from Tanzania, Kenya and Nepal.*
- Identify how project learning is used to inform Tanzania's national climate strategy and plan of action

Annex 5: Project Overview

IIED, presented by Ced Hesse

Mainstreaming climate change adaptation in drylands development planning in Tanzania

The issues for northern Tanzania

- Climate variability is increasing – will impact drylands of Tanzania earlier & harder
- People that live in drylands (pastoralists and agro-pastoralists) are 'masters' of adaptation – but are not as effective
 - Loss of key natural resources, reduced mobility;
 - Weak voice, especially in planning;
 - Traditional institutions not strongly linked to government institutions;
 - Government & traditional planning not complementing each other
 - Climate not integrated into planning
- **GoT recognises need for climate change adaptation through local government.....BUT how to do this? Business as usual will not work!**

Key principles to learning

- Learn together in a participatory way
- Build the capacity of all stakeholders to participate in the learning
- Adopt an ecological, economic and social framework to building adaptive capacity – holistic not sectoral
- Planning needs to be done in an integrated way at multiple scales including cross-border
- Build on success and experience
- Work through existing structures

1-year preparatory phase to design 5-year pilot project

December 2011 to November 2012

- **Funded by DFID - £230,000 for activities**

Objectives:

- Strengthen the capacities of local actors (government, communities, CSOs) in the Districts of Monduli, Ngorongoro and Longido to design, implement & own the 5-year pilot project;
- Secure national interest in the pilot project to ensure project experience informs national policy processes and programs in support of climate change adaptation and mitigation nation-wide

Activities of preparatory phase

- Inception workshop for district and national stakeholders
- District consultative and learning groups
- Training on climate change and dryland ecology and economy
- Linking government and community planning
- National consultation and engagement
- Programme planning & validation workshop
- **Output:**
 - A fully costed five year project proposal (business case) designed in an informed and participatory manner by the key actors at district-level to support local adaptive capacity – including **District Adaptation Fund**.

Annex 6: Climate Change in N. Tanzania: what do we know?

Presentation for Mainstreaming Climate Change Adaptation in Drylands Development Planning Workshop: 25th-27th January 2012

IIED, Presented by Victor Orindi

Key messages

- **Tanzania might get wetter.** The increase in rainfall in East Africa, extending into the Horn of Africa, is robust across the ensemble of GCMs, with 18 of 21 models projecting an increase in the core of this region, east of the Great Lakes.
- **Increases in rainfall and temperature will only translate in increased agricultural productivity in specific locations..** In lowland regions since increases in temperature will also increase evapotranspiration and offset any potential increase in productivity.
- **Increased drought frequencies could cause significant, irreversible decreases in livestock numbers in arid and semi-arid areas**
- **Tanzania will have significant areas in the ASALs where cropping might no longer be possible as a result of CC and where the role of livestock as a livelihood option is likely to increase**

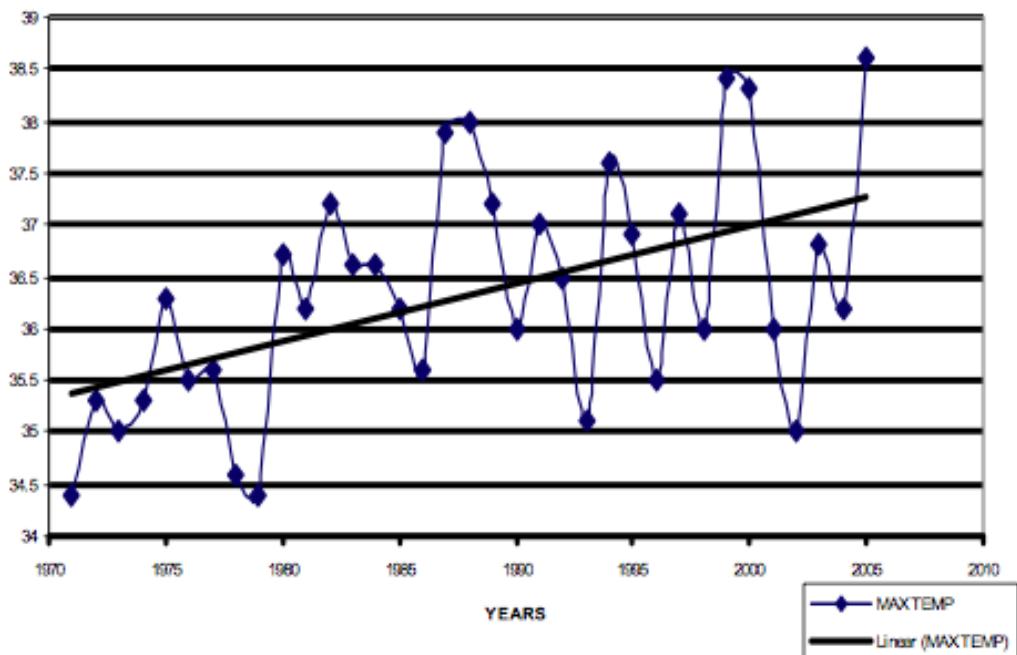
Current Climate and Variability

- Two rainy seasons; short 'vuli' rains from Oct-Dec and the longer 'masika' rains from Mar-May.
- Rainfall strongly influenced by El Niño/La Niña and the Indian Ocean Dipole.
- El Niño years associated with intense rainfall and flooding (e.g. 1997/98, Jan 2010), and La Niña with decreased rainfall and drought conditions (e.g. 1996/97).
- Climate can vary greatly over short distances and between years; differences of up to 250mm/month between wettest and driest years (Jack 2010).

Observed Trends

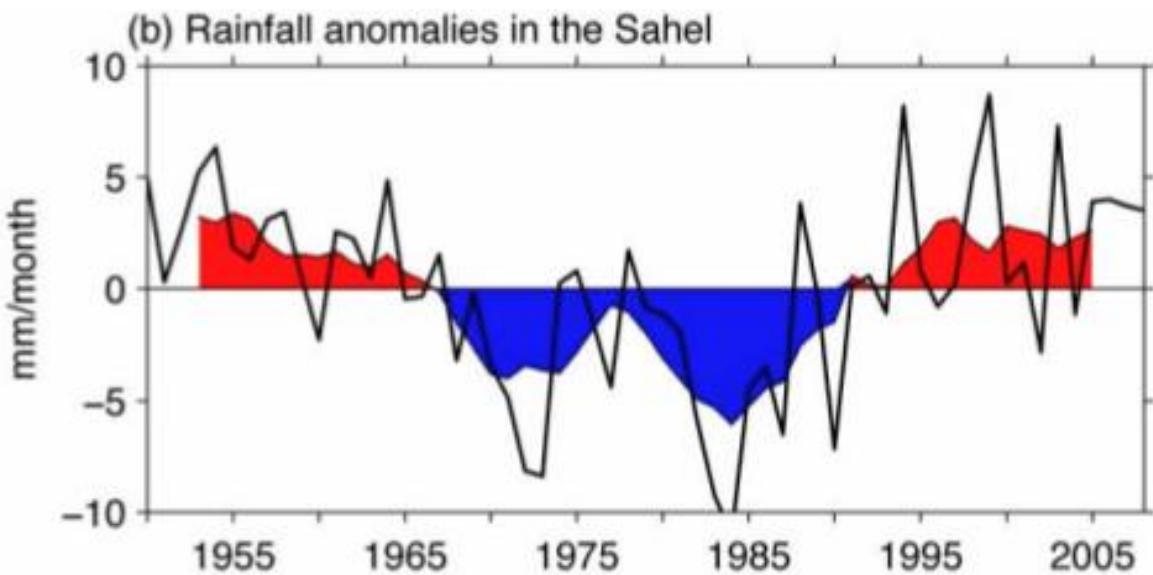
- Increase in minimum and maximum temperatures at many stations
- There has been an increase in the frequency of 'hot' days and nights and decrease in the number of 'cold' days and nights (New *et al.* 2006).
- **Unclear how rainfall has changed**, although there is some evidence for **more variability and unpredictability**. Regional studies suggest there has been some increase in annual rainfall, however this may vary significantly locally.
- More work is needed to understand trends in rainfall for N. Tanzania.
- There is a perception that there has been an increase in the number of extreme events, however the data are not conclusive.

Kilimanjaro maximum temperature



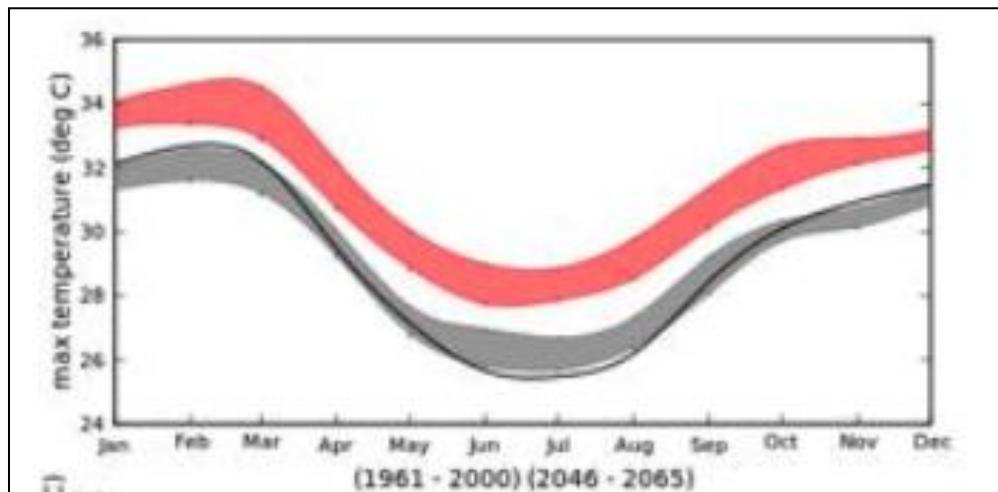
Change in maximum temperature at Kilimanjaro Station. Source: NAPA

A climate trend or natural cycle?



- It is easier to be clear about trends in temperature than trends in rainfall.
- In the example above 1955-1985 is a clear decreasing trend. Assuming it would continue however is wrong, as 1985-2005 shows an increase. . . difficult to know when a trend is an indicator of climate change and when it is just part of a natural cycle.

Climate Projections: Temperature



Changes in Maximum Temperature for Kilimanjaro Airport. Grey = Current Climate, Red = Future Climate

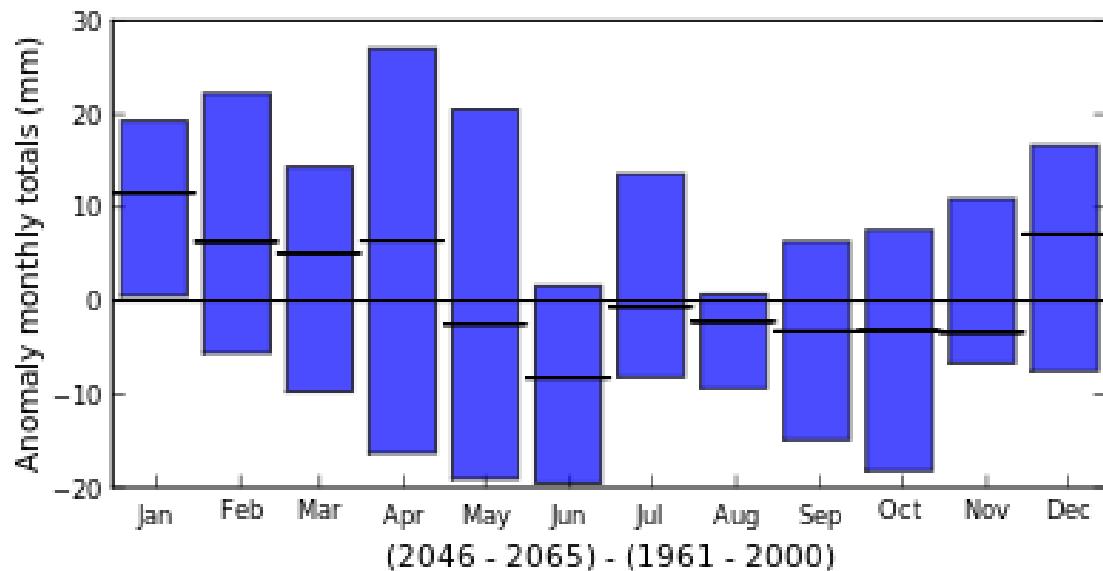
- All climate models agree that there will be an increase in both minimum and maximum temperatures by mid-century, continuing the trend currently seen.
- The degree of change varies depending on the model and level of emissions. For Tanzania increases of 1-3°C are expected by the 2050s (at present emissions rates it is more likely to be near 3°C than 1°C!)

Climate Projections: Rainfall

- Projections for rainfall are less clear than for temperature; much more variability and much more complex to model.

- Several studies suggest an increase in rainfall for East Africa and N. Tanzania.
- A recent study for Tanzania as a whole suggests increases in rainfall at the end of the Masika rains are likely (Jack, 2010)
- Changes may be locally variable, however. Analyses for Arusha and Narok suggests increased rainfall but uncertain changes at the end of the Masika rains.

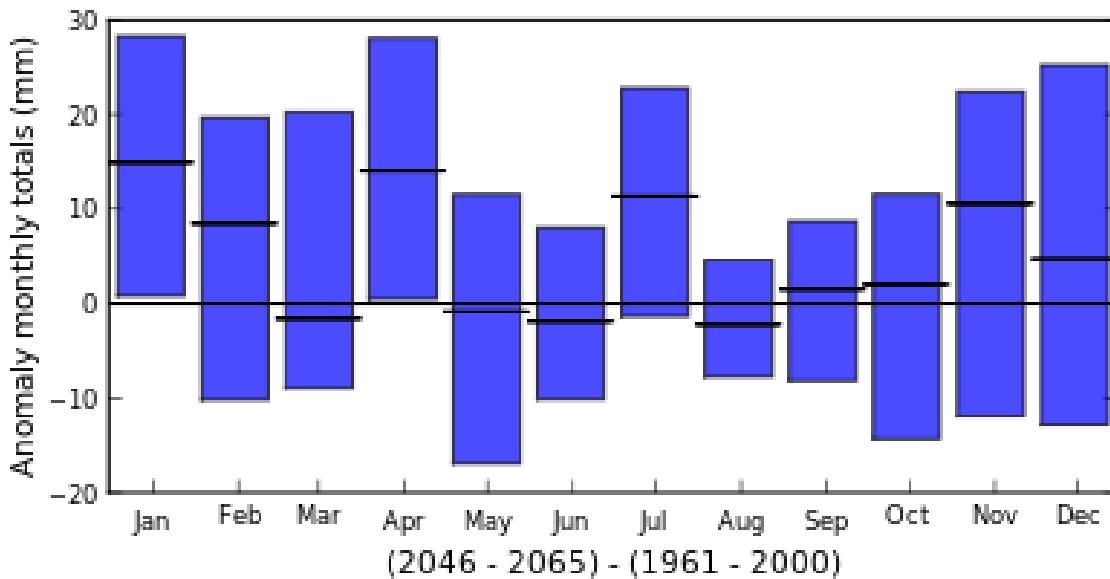
Example: Arusha



Changes in precipitation at Arusha for 2046-2065 compared to 'current' climate of 1961-2000.

Blue boxes cover the range of changes given by different models (the uncertainty), and black lines are the median projections from all models.

Example: Narok



Changes in precipitation for 2046-2065 compared to 1961-2000. Blue bars show the range of projections from different models. Projections are clearer for some months than others!

Changes in Extreme Events

- The average intensity of rainfall is expected to increase and may increase flood risk.
- Despite possible increases in rainfall, droughts will continue to be a major hazard.
- Droughts and floods are associated with phenomena such as El Niño and the Indian Ocean Dipole. Climate models are unclear how these driving processes will change, which adds uncertainty to changes in droughts and floods.

Climate change and SAT

- With climate change, the area under SAT is expected to increase by 2050
- In case of Tanzania SAT area is expected to increase by 878,016 ha while 64,569 ha SAT area is expected to turn arid

From coping with variability to adapting to climate change

- Local communities have learned to “cope” with variability through a number of strategies.
- But coping strategies are risk avoiding – mitigate against disasters in bad years **but fail to exploit better years – lost opportunity**
- Households survive but remain poor and vulnerable to climate variability and change –just coping is not enough for Africa’s rural poor
- Need to Build their livelihood resilience and adaptive capacity NOW if they are to have any hope of successful adaptation to future climate change.

.....Coping to adapting

- There remains uncertainty over changes to precipitation but we need to act now as we are already seeing some impacts
- If we can put in place systems to deal with current variability we will be better placed to adapt to future changes.
- We need to include uncertainty in our decisions.
- Local information can be extremely valuable in understanding what is happening.

- Strong institutions working together is essential

Things you may explore in this project

- If data are available then performing the **downscaling** for Met stations closer to the project districts would give **more relevant projections**.
- Integration of local knowledge with external projections.
- Analysis of changes in inter-annual variability & changes in within-season variability.
- Analysis of changes in important thresholds (e.g what is the max temperature for livestock?)

Annex 7: Climate variability and change in Tanzania: The role of TMA

TMA, presented by Dr. Ladislaus B. Changa and Mr. Agustine Kanemba

Contents

- Climate of Tanzania
 - Climate services offered by TMA
 - Implication of deforestation and forest fires to local climate
 - Signals and projection of climate change in Tanzania
 - The role of TMA in climate change Adaptation
 - Mitigation and Adaptation to Climate change
- Recommendation

Key questions

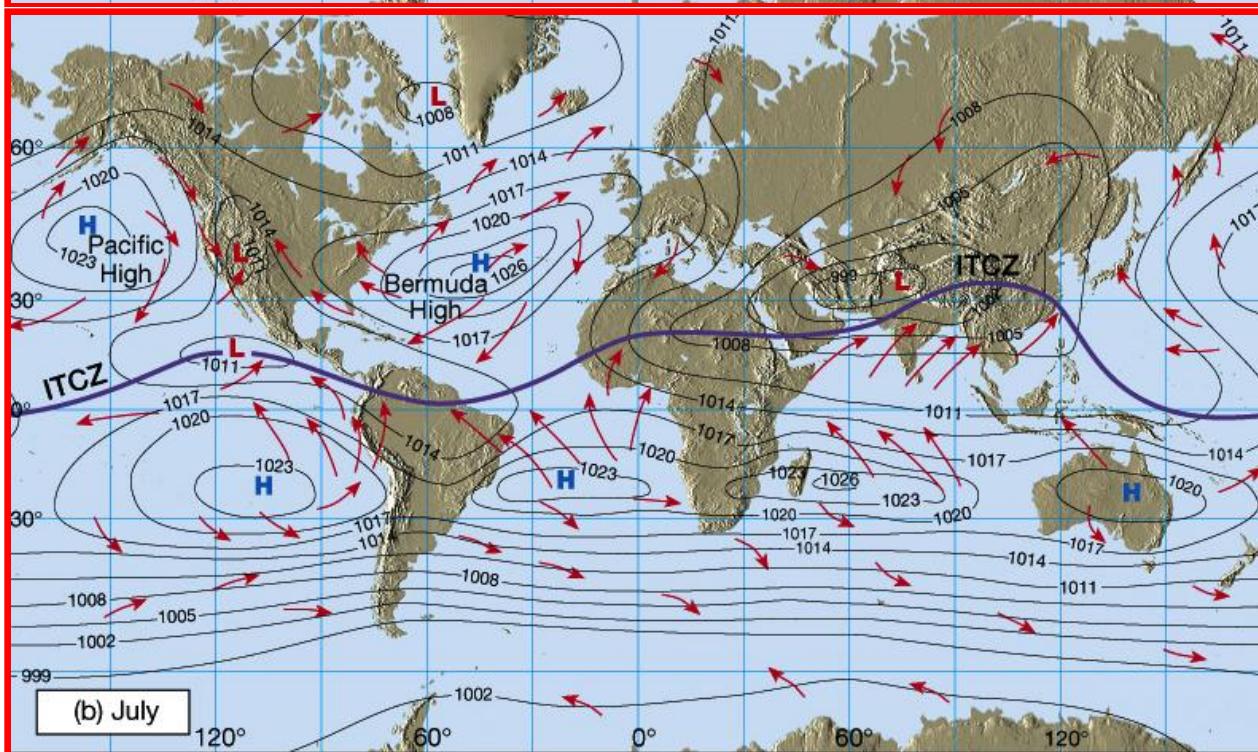
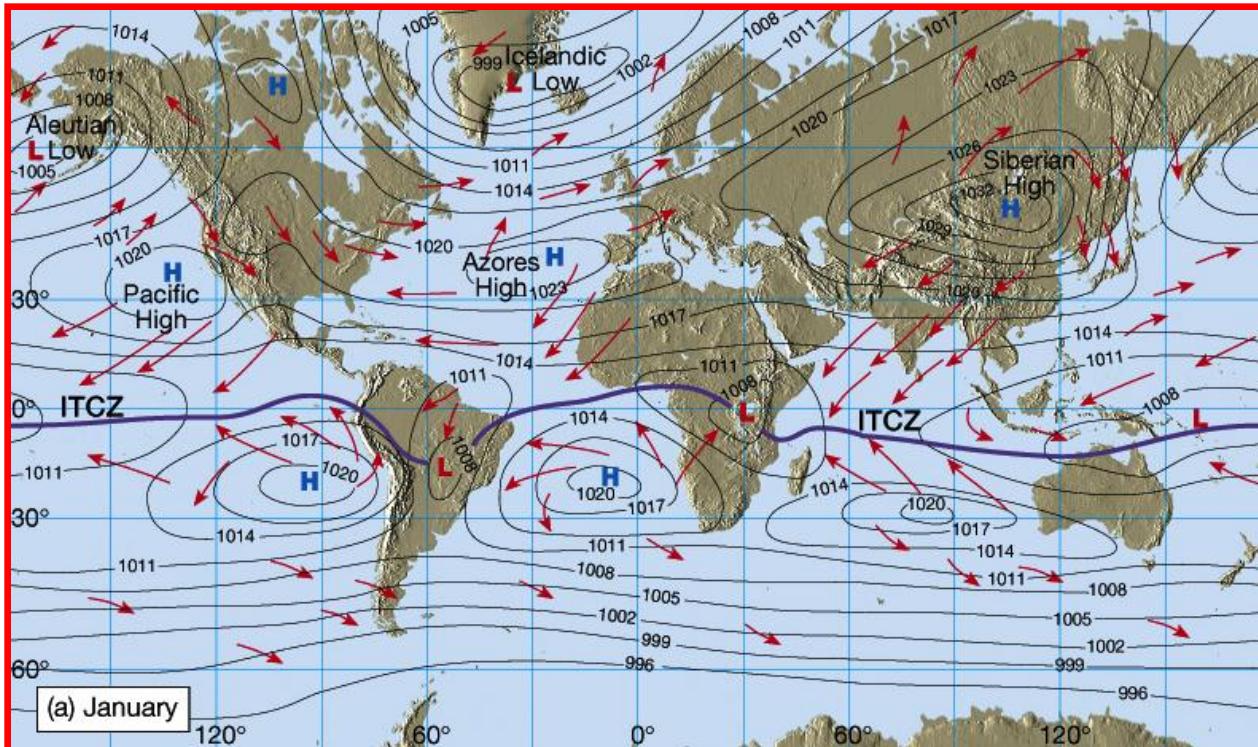
1. Which are the main rainfall factors in Tanzania?
2. Why is rainfall so variable in Tanzania?
3. What are the main causes of climate change?
4. What is the role of TMA in climate change adaptation?
5. Which are the signals of climate change in Tanzania?
6. Can I as an individual contribute to climate change adaptation and mitigation?

The Climate of Tanzania

1. Rainfall pattern
2. Main rainfall forcing Factors across Africa

Forcing factors

- ITCZ
- Monsoon
- ENSO
- IOD
- Congo air mass (westerlies)
- Tropical cyclones
- Mesoscale features



Ocean Currents

INDIAN OCEAN DIPOLE (IOD)

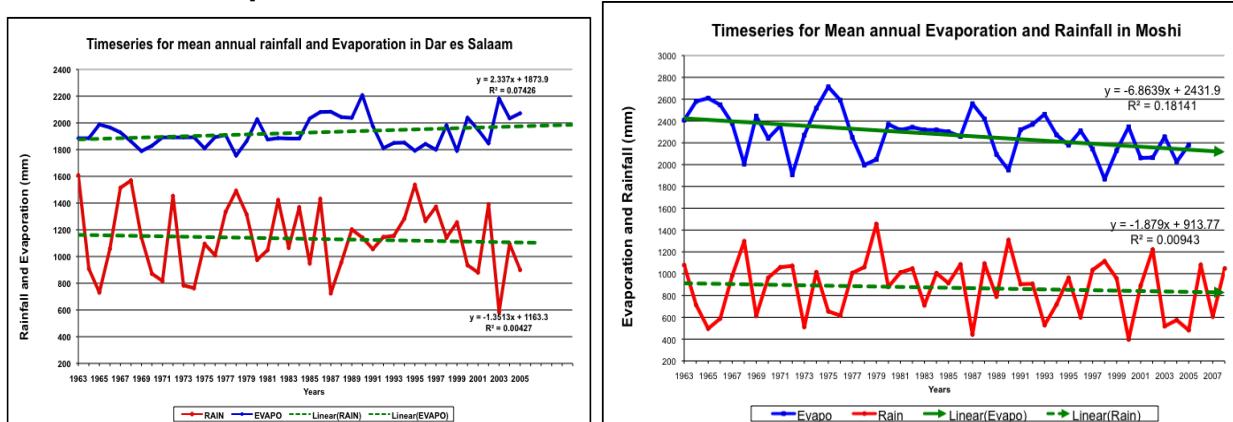
The importance of weather and climate information

1. Agriculture and Livestock sector
2. Transport sector
 - ❖ Air transport
 - ❖ Road and Railway transport
 - ❖ Maritime transport
3. Health sector
4. Building and Construction
5. Water
6. Communication
7. Tourism

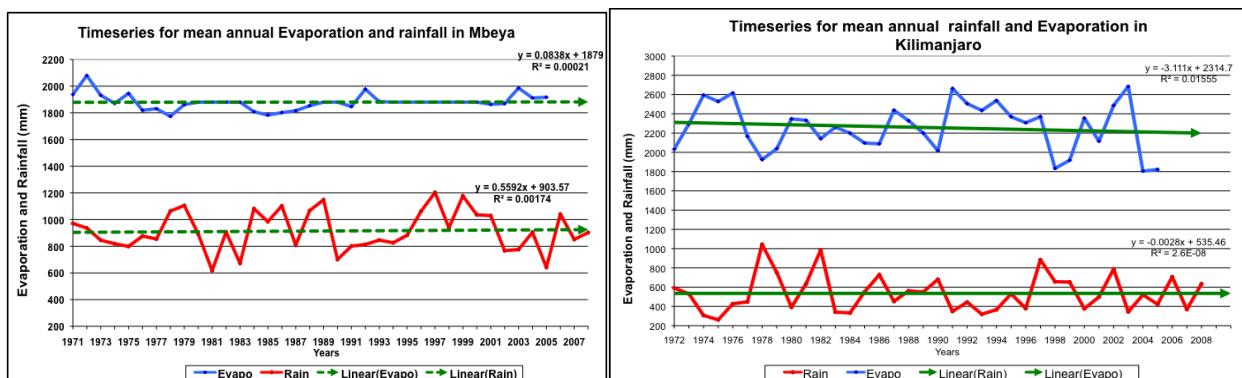
Weather and climate information offered by TMA are important for:

- Road transport
- Aviation
- Railway transport
- Maritime transport
- Construction

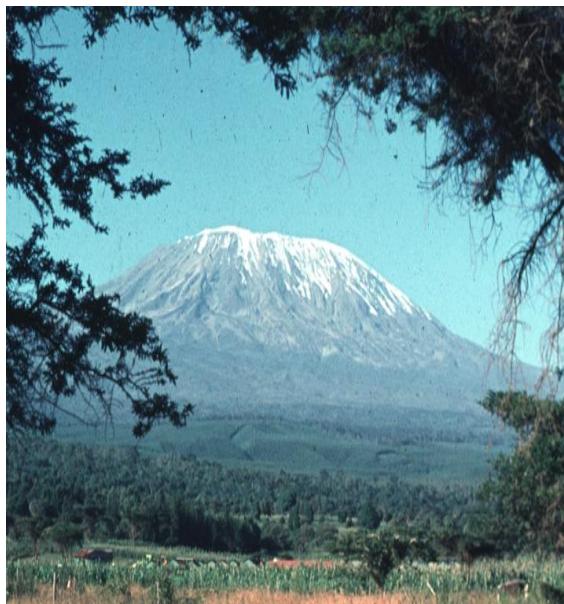
Signals of climate change in Tanzania Rainfall and Evaporation trends



Rainfall and Evaporation trend for selected stations



Melting of glacier over Mt. Kilimanjaro



1974



2007

Signals of Climate Change in Tanzania

- ❖ Increasing temperature and decreasing rainfall trends observed in most parts of the country
- ❖ Increase in rainfall variability coupled with frequent and prolonged droughts
- ❖ Retreat of glacier over Mt. Kilimanjaro
- ❖ Decrease in water levels of Lake Victoria and Tanganyika
- ❖ Increased Malaria endemicity in highland areas

The role of TMA in climate Change Adaptation

- Weather and climate monitoring and prediction
- Provision of early warning information on impending hydrometeorological related disasters
- Education and climate change awareness

Mitigation measures

- Renewable energy sources
 - ❖ Solar energy, Wind energy, Geothermal and Bioenergy
- Efficient use of energy
 - ❖ Energy server appliance
 - ❖ Energy efficiency bulb
- Afforestation, reforestation, reduced deforestation

Adaptation Measures

- Promote the cultivation of early maturing and drought-resistant crops in arid and semi-arid areas and in areas where rainfall is projected to decline
- Promote rainwater harvesting
- Reduce dependence on single source of energy
- Livelihoods diversification

Challenges

- The need to enhance surface and upper air observations for comprehensive monitoring of weather and climate
- High cost involved in running weather stations
- Lack of central forecasting office which hinder installation of some of meteorological equipments
- The need to enhance dissemination of weather and climate information to reach end users even in remote areas

The need for enhanced climate monitoring capacity

Description	Number of stations			
	Current	Operational	Needed	Shortage
Conventional Surface synoptic stations	26	26	32	6
AWS Surface synoptic stations	14	5	113	108
Agrometeorological stations	15	15	20	5
Ordinary climate stations	150	60	250	100
Rainfall stations	2056	500	500	-
Automatic Rainfall stations			2500	2500
Marine weather station	0	0	12	12
Upper air stations	1	1	4	3
Pilot Balloon	1	-	5	5
Weather Radar	1	0	7	6
Lightning	0	0	10	10
Orbiting satellite receiver			1	1

Recommendation

- Enhance Climate Change awareness
- In the context of climate change adaptation, initiative should be taken to enhance weather and climate monitoring and prediction
- Promote the establishment of building codes that incorporate rain water harvesting. All buildings including public and private should put priorities on rain water harvesting
- To reduce deforestation, efforts on alternative energy sources should be enhanced

Annex 8: Recommendations from the three districts: Longido, Monduli and Ngorongoro

Recommendations from Longido:

- Educate community to do things differently such as how to:
 - sell stock before drought produces failure of the stock
 - manage and market products
 - make hay for dry season use
 - modify their way of life
 - reclaim pasture land (by leaving land bare for a few years)
- Development of an early warning system so that pastoralists can act quickly
- Water harvesting is critical

- Create an infrastructure for marketing and managing livestock for example by:
 - Setting up a Pastoralist Cooperative Union for Longido District – to identify a proper market for cattle or seek loans. Longido is also working to improve cattle breeds and make them more resilient.
- Climate change is creating conflict between agriculture and pastoralism, between tourism and other sectors. A conflict resolution strategy is needed, and this may draw on local mapping or other evidence. The Longido MP suggests:
 - Community maps with farming (cropped) areas
 - Livestock corridors
 - Water points
 - Dry season and wet season pasture

Recommendations from Monduli

- Reduce the use of fuelwood
- Use of biogas
- Solar power
- Water harvesting
- Construction of water collection points, wells
- Changing the type of crops grown
- Activities to improve crop production and livestock keeping
- Education
- Identify areas of use according to the existing laws
- Develop rangelands by fencing the designated areas

Recommendations from Ngorongoro

- Try to conserve areas which will be useful during drought
- Storage of grass which can be used during drought
- Ensure funding is set aside to help buy fodder and water during dry season

Annex 9: Tanzania Draft National Climate Change Strategy and Action Plan (NCCSAP)

VPO, presented by Ladislaus Kyaruzi

Agenda

- Introduction
- Rationale
- Mandate
- Methodology
- Goal
- Specific Objectives
- Policy Relevance
- Key issues
- Scope
- Adaptation strategies
- Mitigation strategies
- Cross cutting strategies
- Resource mobilization
- Way forward

Introduction

- Climate change is already proven scientifically to be caused by deposition of huge quantities of GHGs into the atmosphere
- It is also proven that the sources of the GHGs are human activities
- This interferes the normal climate system of the globe
- The impacts of this problem are immense and developing countries like Tanzania do suffer most

Context

- In 2008, the Vice President's Office-Environment reached an agreement with the Government of Denmark for a support to implement the project named "Enhancing National Capacity to Adapt to the Adverse Impacts of Climate Change"
- Part of the project implementation was to develop a National Climate Change Strategy and Action Plan through a participatory but technically rich process

Rationale for climate change strategy

- Development of this Strategy and Action plan is a critical milestone for the country in facilitating implementation of climate change interventions
- The need for this Strategy is critical based on the following facts
 - a) To facilitate strategic implementation of climate change activities which enhances sustainability and resilience
 - a) Over the past few years, a number of assessments and analyses have been conducted indicating high level of vulnerability and vivid impacts of climate change in most of the sectors
 - a) This indicates the need for immediate and urgent, medium and long term strategic approaches in addressing the challenge
 - b) developing a comprehensive strategy that takes into account the national adaptation and mitigation needs at all levels is thus paramount
 - b) The National Environmental Policy recognises international cooperation as a key tool in addressing environmental challenges at country and international level
 - c) the development and implementation of this Strategy will contribute significantly to the international community efforts to address climate change and open up windows for the country to benefit from climate change mitigation opportunities
 - d) The Cancun/Durban outcomes require Developing countries to prepare Nationally Appropriate Mitigation Actions (NAMAs) and National Adaptation Plans (NAPs). This strategic approach will provide a good basis for NAMAs preparation in Tanzania
 - e) This Strategy provides a broader, nationally based guidance on the implementation of climate change activities by and across all stakeholders.

Mandate

The Environmental Management Act Cap 191 empowers the Minister responsible for Environment to, among others, take appropriate measures to address climate change. Therefore, this Strategy is part of the measures the Government is taking to address climate change within that context.

The Methodological Approaches

- The process for the preparation of the strategy commenced in 2008, since then, it has gone through a number of methodological approaches

Methodology

- Literature review
- Primary data through assessments of locally based climate change impacts were conducted in six thematic areas in selected regions of Tanzania (Zanzibar, Mbeya, Tanga, Coast Region, Manyara, Shinyanga, Mwanza,), including Zanzibar
- Public consultations (including five zonal consultative workshops

- The workshops were conducted in southern zone (31 January-2 February 2011) in Mtwara; northern zone (6-9 March 2011) in Arusha; Lake Zone 26-29 May 2011) in Mwanza; and western (20-21 June 2011) in Mpanda.
- Five working sessions of the National team of experts
- Submitted to NCCTC
- 24-25 Jan 2012: National consultative workshop

The Goal

- The main goal of this Strategy is: to adapt to climate change and participate in global efforts to mitigate climate change with a view to achieving sustainable development in the context of the existing international framework, Vision 2025 and national as well as cross sectoral and sectoral policies in the country

Specific Objectives

- To achieve the stated goal, the following three objectives have been set:
- To build capacity of Tanzania to adapt to the adverse impacts of climate change
- To enhance resilience to the challenges posed by climate change

Policy Relevance

- The National climate change Strategy and Action Plan for Tanzania existing national policy context
- Addressing climate change challenges must address climate change related developmental challenges such as reducing poverty and enhancing efforts to achieve sustainable development.
- The Strategy therefore takes into account and is closely linked to the current national strategies / programmes e.g. MKUKUTA II
- Improving the livelihoods, particularly of the poor and the most vulnerable groups is taken into account.

Critical challenges/Issues

- extreme poverty of the most vulnerable groups;
- poor infrastructure , especially poor rural roads
- limited credit opportunities for rural communities
- the impact of existing health stresses such as HIV/AIDS
- Limited capability of local personnel to effectively analyze the threats and potential impacts of climate change
- This strategy is intended to strategically guide the efforts to address the climate change related challenges amidst the critical challenges raised

Strategic Implementation Options

- Based on the key challenges and issues identified, the Strategy identifies ten various interventions in line with sectors/themes for each of the three broader categories, i.e adaptation, mitigation and Cross cutting issues.
- The matrices in Chapter 3 provides strategic statements for each key sector/theme, as well as its goals, strategic objectives and Strategic interventions

Adaptation strategic objectives

Water Resource

- To enhance protection and conservation of water catchments
- To invest and promote appropriate water management technologies
- To invest in exploration and extraction of underground water.
- To improve water quality

Coastal and Marine environment

- To promote sustainable management of coastal and marine environment
- To strengthen coastal and beach erosion control systems
- To promote livelihood diversification for coastal communities

Adaptation strategic objectives

Forestry

- To mainstream climate change aspect into forest management practices
- To promote use of lesser known plant species.
- To promote alternative livelihood to forest dependent communities.
- To promote use of non-timber materials.

Wildlife

- To promote wildlife management practices that increase resilience to climate change.
- To establish wildlife climate change related monitoring and information management systems

Agriculture and food security

- To identify suitable crops for new agro-ecological zones.
- To promote appropriate agricultural practices that increase resilience to climate change.
- To promote use of appropriate technologies for production, processing, storage and distribution

Human Health

- Enhance public health care systems capacity to respond to climate change-related health risks.
- Improve disease surveillances and design of diseases control programmes (e.g. preventive and curative procedures).

Tourism

- To promote alternative tourist attractions.
- To restore the degraded tourist sites.
- To sensitize and enhance adaptive tourism infrastructural development.

Energy

- To promote and improve use of alternative energy sources.
- To promote use and acquire efficient energy technologies in household, public and industrial sectors.

Industry

- To promote alternative energy sources
- To promote adoption of energy efficient technologies.
- To promote establishment and adoption of firm environmental policy Firm means organisational enterprise

Livestock

- To promote climate change - resiliency livestock farming practices
- To acquire appropriate technologies for livestock production systems

Fisheries

- To promote protection and conservation of aquatic ecosystems.
- To explore and promote alternative/diversified means of livelihoods for fisheries communities

- To promote environmentally friendly and adaptation technologies in fish catch, processing and storage

Infrastructure

- To mainstream climate change aspect into infrastructure designing and development.
- To promote deployment and use of appropriate technology in infrastructure designing and development.

Human settlements

- To mainstream climate change issues into urban and rural planning.
- To promote use of appropriate building materials adaptive to climate change.
- To promote acquisition and use of efficient technologies in households and public facilities.
- To promote sustainable availability of livelihoods and social services in both urban and rural areas.

Land use

- To promote and enhance sustainable land use planning at all levels
- To mainstream climate change into land use planning.

Mitigation strategic objectives

Forestry

- To promote and enhance afforestation and reforestation in the context of CDM.
- To enhance implementation of National REDD Strategy.

Energy

- To promote use of efficient energy technologies.
- To enhance supply and use of renewable energy.
- To promote use of other clean energies.

Agriculture

- To minimize emissions from farm inputs.
- To enhance carbon sequestration in agriculture sector.

Industry

- To promote diversification of clean energy sources.
- To promote adoption of energy efficient technologies.
- To promote establishment and adoption of firm environmental and energy policies.

Livestock

- To promote appropriate livestock management practices that reduce emissions
- To promote use of improved animal feed stuffs.

Transport

- To promote low emission transport systems.
- To promote non-motorized transport systems.

Mining

- To promote diversification and integrated clean energy sources.
- To explore carbon capture technologies.
- To promote adoption of energy efficient technologies.
- To promote establishment and adoption of firm environmental and energy policies.

Wetlands

- To promote conservation of wetlands.
- To promote alternative livelihoods to wetland dependent communities.
- **Strategic objectives on Cross cutting issues**
- To promote management of natural and manmade wetlands.

Waste management

- To promote application of sanitary landfills.
- To promote wastewater management.
- To promote energy generation from municipal wastes.

Strategic objectives on Cross cutting issues

Research and development

- To enhance coordinated research on climate change patterns, impacts, vulnerability and adaptation, mitigation options.
- To promote researches and development on technologies that will ensure sustainable response systems.

(Information, Communication, education and public awareness)

- To enhance information sharing and communication system
- To mainstream climate change issues into education system.

Technology and development and transfer

- To promote investment on technology development and transfer.
- To establish mechanisms and centres of excellence on technology development and transfer.
- To enhance technology partnerships and networks.

Capacity building and Institutional strengthening

- To build institutional capacity to effectively address climate change issues
- To strengthen institutional coordination and inter-linkages.

Systematic observation

- To promote expansion of surface and upper air observing networks
- To enhance capacity in remote sensing
- To Enhance capacity in data base management
- To promote Indigenous Knowledge in weather and climate prediction

Early warning systems

- To enhance early warning systems that respond to the challenges of climate variability and change
- To establish efficient mechanism for packaging and dissemination of weather and climate information
- To promote advanced weather forecasting technologies.

Disaster and Risk management

- To strengthen national capacity for disaster risk reduction
- To strengthen coordination and collaboration between diverse stakeholders in disaster management.
- To mainstream climate change into disaster risk management programmes.

Impacts of response measures

- To establish the impacts of response measures in all development and social sectors
- To establish opportunities and costs related to the response measures to climate change
- To ensure land/forestry based activities to address climate change do benefit, and are undertaken and management by, Tanzanian under the strict adherence of existing national laws.

Gender and vulnerable groups

- To integrate gender into climate change awareness programmes
- To promote research that generates gender disaggregated data on impacts and response to climate change
- To enhance participation of women in planning, decision making and implementation of climate change initiatives
- To promote gender equity in benefit sharing of opportunities arising from climate change

Planning and financing

- To build effective and efficient system for mobilization and management of climate funds
- To mainstream climate change issues into planning at all levels

- To ensure private sector participation in climate change mitigation and adaptation
- To ensure observance of rule of law in climate financial management
- To ensure flow of climate change opportunities to the public.

Resource Mobilization

Domestic Sources of Funds

- Revenue collection by the Government.
- National Environmental Trust Funds and REDD Trust Funds; Payments for Environmental Services (e.g. Payment for Ecosystem Services-PES); funds obtained through Public Private Partnership and funds from local NGOs.

International/Multilateral Funds

- International/Multilateral Funds that are financing climate change include the Global Environmental Facility (GEF); Funds under United Nations Framework Convention on Climate Change (UNFCCC); and Funds under Kyoto Protocol.

Funds under United Nations Framework Convention on Climate Change (UNFCCC)

- Funds under UNFCCC are the funds which were established to facilitate implementation of the convention. The funds include Least Developed Countries Fund (LDCF), Special Climate Change Fund (SCCF) and Green Climate Fund.

Funds under Kyoto Protocol

- The only fund established under this arrangement so far is the Adaptation Fund.
- The Adaptation Fund has been established to finance concrete adaptation projects and programmes in developing countries that are parties to the Kyoto Protocol.
- The Fund is financed with 2% of CERs issued for CDM

Bilateral Funds

- These include for example Governments of Australia, Germany, Japan, Spain and the UK together with the European Union.

Other sources (loans and grants)

- The World Bank Funds
- Africa Development Bank (AfDB) Funds
- East Africa Climate Change Funds

Individuals and foundations Funds

Way Forward

- To be shared with key stakeholders (vertically and horizontally) through stakeholders workshops, technical meetings, public disclosure (posting the draft version in the Ministerial website and in national newspapers)
- To be shared with the National Climate Change Steering Committee
- Finalize the document by the Team
- Submission to the Government for approval
- Implementation

Annex 10: Kenyan experience

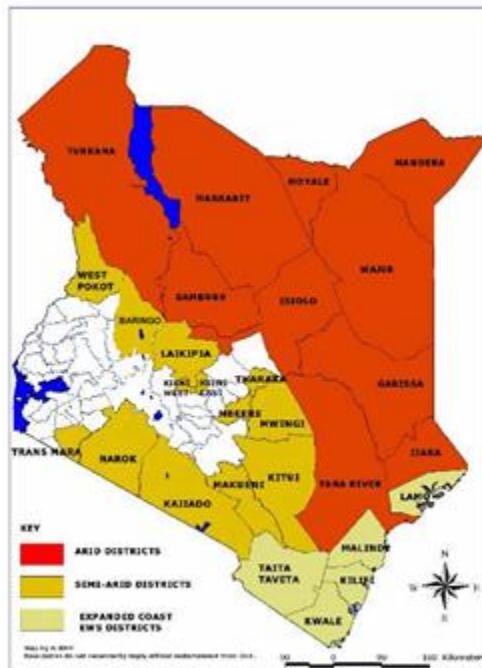
Kenyan ASALs

Accounts for:

- Over 80% of Kenya's Land Area
- 38% of the population
- Over 70% of the livestock & 90% of the wildlife

Challenges

- Aridity and variability
- High levels of poverty
- Poor infrastructure and cost of doing business high
- Weak coordination can have undesirable consequences for envt or for social relations



Need for mainstreaming in Kenya

- Kenya is vulnerable to climate change since the key drivers of the economy (agriculture, livestock, tourism, forestry, and fisheries and energy) are climate-sensitive.
- Climate change is therefore not only an environmental issue, but also a developmental one.
- Climate change also presents **new and emerging challenges that were hitherto unknown** - need to come up with integrated ways of dealing with the challenges and enabling the country to take advantage of opportunities that may arise.
- This need is highlighted in the Kenya National Climate Change Response Strategy (NCCRS, 2010).

Kenya's NCCRS

- Launched in 2010.
- Provides:
 - A framework for addressing threats of climate change as well as taking advantage of any opportunities that may arise.
 - The means to actively engage in innovative processes necessary to address climate change.
- Inform nationwide Climate Change programme development and activities, including efforts towards the attainment of MDGs, Vision 2030 and the Constitution of Kenya (2010).
- Underlines the need for Climate Change policy/legal framework.

NCCRS Vision and mission

Vision: A prosperous, climate change resilient country.

Mission: To strengthen nationwide focused actions towards adapting to, and mitigating against a changing climate by ensuring commitment and engagement of stakeholders while taking into account the vulnerable nature of our natural resources and society as a whole.
Scope: impacts of CC, adaptation and mitigation options, Education & Awareness, R&D, CC governance, Action plan –cost and resource mobilization

NCCRS Roadmap

- Recommends strengthening of V2030 to reflect CC issues
- The NCCRS Roadmap envisions several activities and programmes.
- Some of these are:
 1. Public awareness/education
 2. Ministerial Focal points/ Desk officers established.
 3. Strengthening of Systematic Observations networks
 4. Training of the media
 5. Mapping of Climate change actors
 6. Climate Change (Donor) Coordination Group-CCCG
 7. Restoration of Water towers
 8. Climate Change Resource Centre to be established.
 9. Costed Action Plan

NCCRS Action Plan

- Need for a comprehensive Climate Change Action Plan to include sectors that may have been omitted
- Task Force (Govt, private sector, CSO etc) overseeing the process
 - Thematic Working Groups
- Proposed Action Plan has 8 main subcomponents:
 - Long-term National Low Carbon Development Pathway;
 - Enabling Policy and Regulatory Framework;
 - National Adaptation Plan (NAP);
 - Nationally Appropriate Mitigations Actions (NAMAs);
 - National Technology Action Plan;
 - National Performance and Benefit Measurement;
 - Knowledge Management and Capacity Development; and
 - Financial Mechanism.

Key Lessons:

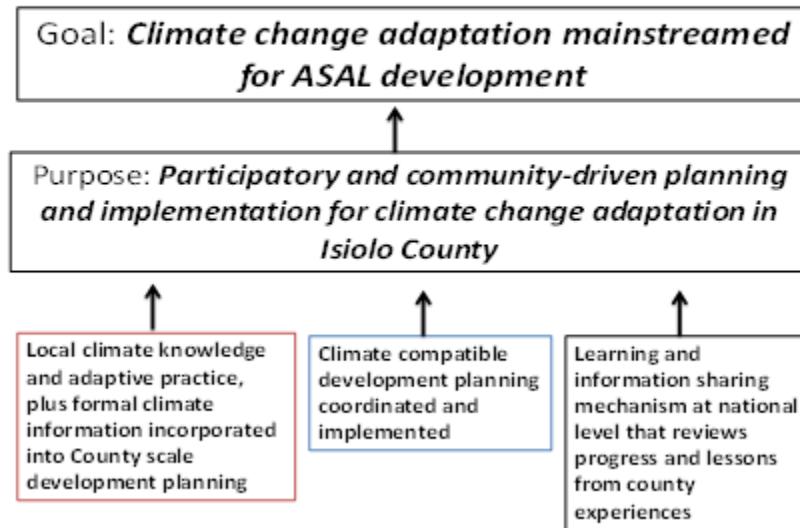
- Public education and awareness creation is important.
- Important to have coordination and harmony across government
- Adaptation is not all about technologies- you need the software as well.
- Involvement of non-state actors –private sector, CSOs, NGOs, Community is key for adaptation.
- Opportunities exists locally and internationally (e.g. Adaptation funds) but you must have plans in place to benefit.

Mainstreaming climate change adaptation into local level planning in Isiolo

- GoK is supporting mainstreaming of CC at various levels
- Testing different approaches using the opportunities offered by the NCCRS Action plan process and new Constitution for greater devolved planning at the county level.
- The MDNKOAL, MPND & V2030, KMD, DSG with support from IIED and other partners in Kenya, are testing approaches that strengthen institutional capacity for climate adaptation in Kenya's drylands that can be taken to scale in a subsequent phase.



Mainstreaming climate change adaptation into county planning –steps



Devolution and Adaptation Planning

- The devolved governance structure- roles and responsibilities [National vs. County & Governor etc.]
- The new constitution dictates that devolution is not just to County Assemblies.. but crucially it must go down to lowest possible local planning unit.

- The initiative aims to support communities (5 sentinel sites- which represent livelihood diversity across the County) by building their capacity to articulate their adaptation priorities- rather than having them imposed from above.

Devolution and Adaptation Planning

- Window of opportunity during period of transition when development planning is open to new ideas.
- Background to the initiative and processes: climate info sharing (community and district level), adaptation planning approach & structure
- Support for customary Institutions

Key Elements

- Resilience assessments and institutional analysis
- Climate Resilience Funds Architecture
 - Actors and relationships
 - County Resilience Fund Committee
- Community radio to facilitate dissemination of climate info and other developmental issues.
- Support to local planning institutions

Conclusion:

- Community-driven planning and implementation for climate change adaptation in Isiolo County
- Greater integration of climate information in development planning
- Facilitating the transformation of planning structures to ensure that local voices are carried upstream to influence county and national planning priorities

Annex 11: Using local knowledge- serving local users 'Strategies and Tools for capturing and presenting local knowledge'

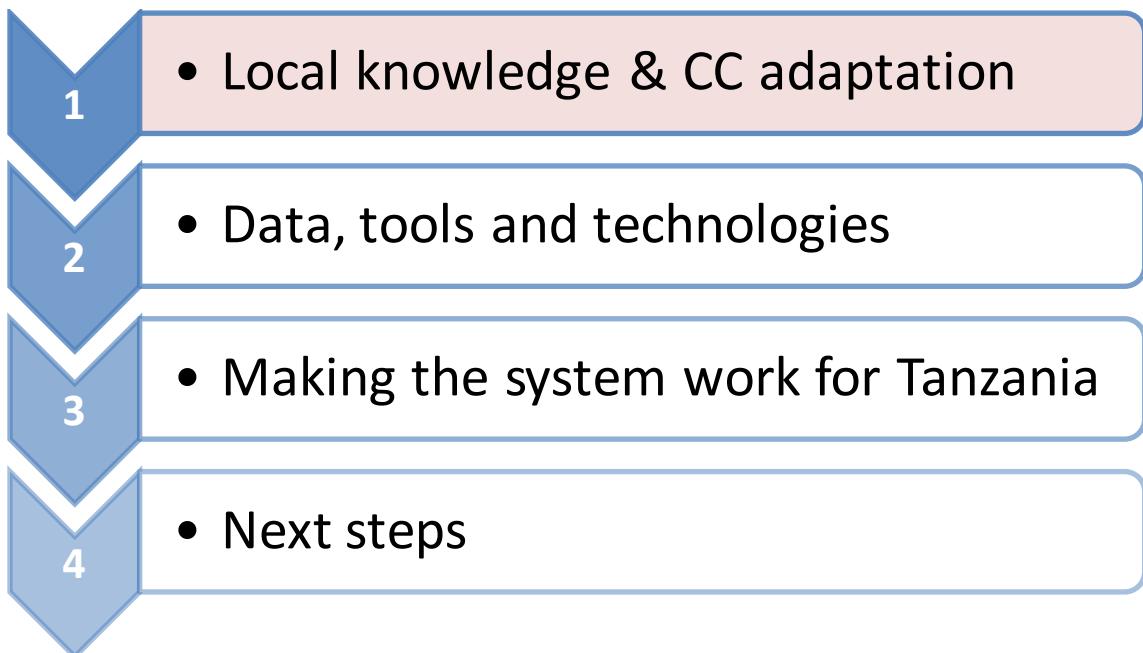
GeoData presentation by Professor Mike Clark and Andy Harfoot

The challenge!

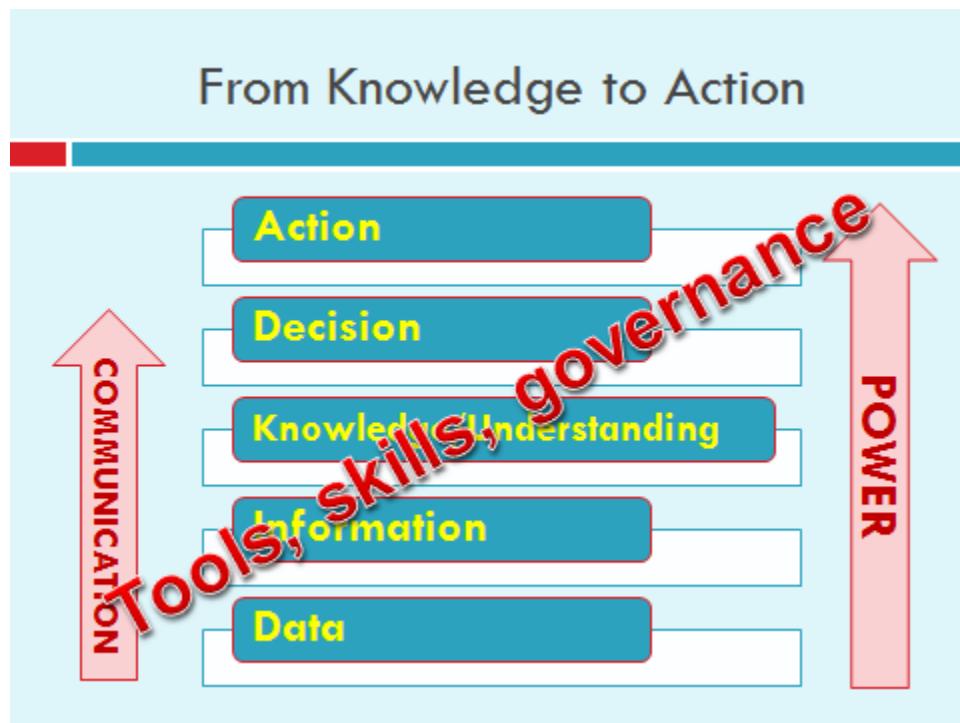
Knowledge has huge power – without it we are blind, we cannot see today or reach out to make tomorrow better. But knowledge is nothing if it does not link to action. Voices are nothing if no-one hears them.

- Specialists think a lot and act little
- Many managers and decision-makers act a lot and think little
- The future lies with those who think and act together – each supporting the other

Stages in the argument



From Knowledge to Action

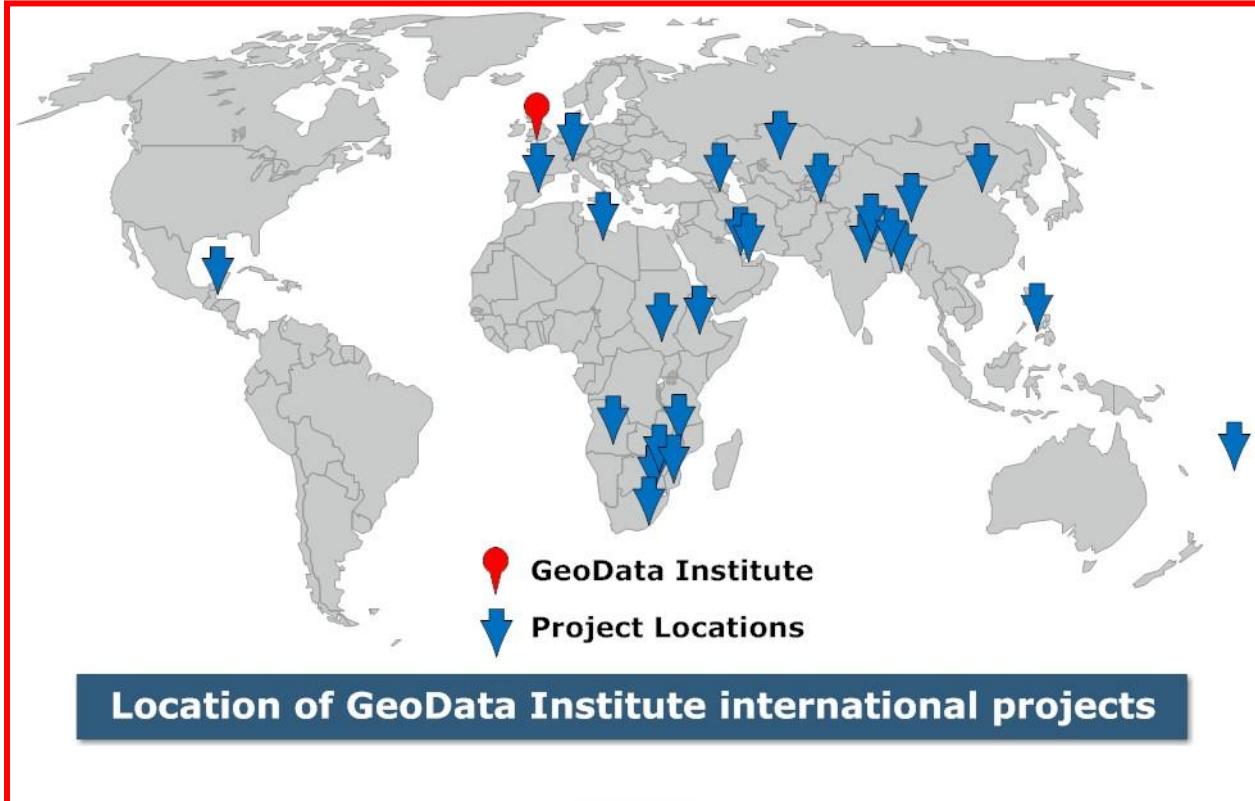


Management and local knowledge

- Managers and politicians face a huge challenge in adapting to physical & economic change
- The future is **complex**, highly **variable** and very **uncertain** (and climate change is just one component)

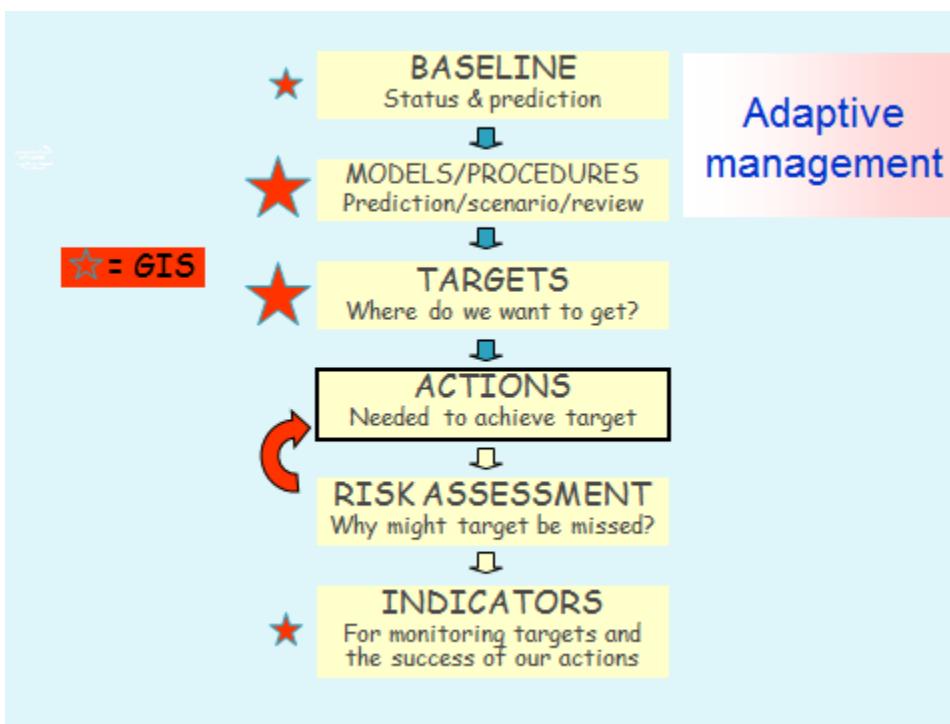
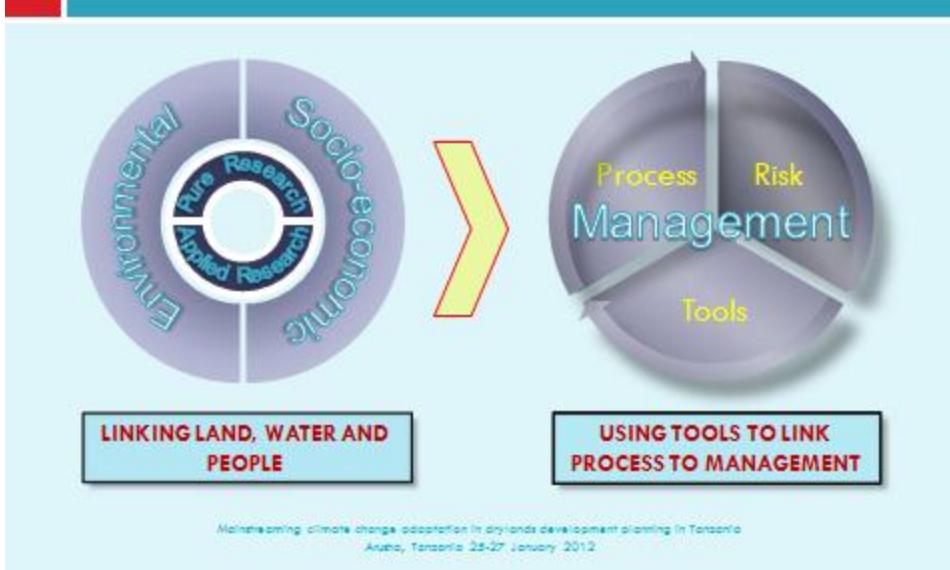
- Under these conditions, simple routine procedures imposed from above or from outside won't work!
- The way forward lies in applying local knowledge & data within local management structures and fuelling it with best practice and technology. Simple?

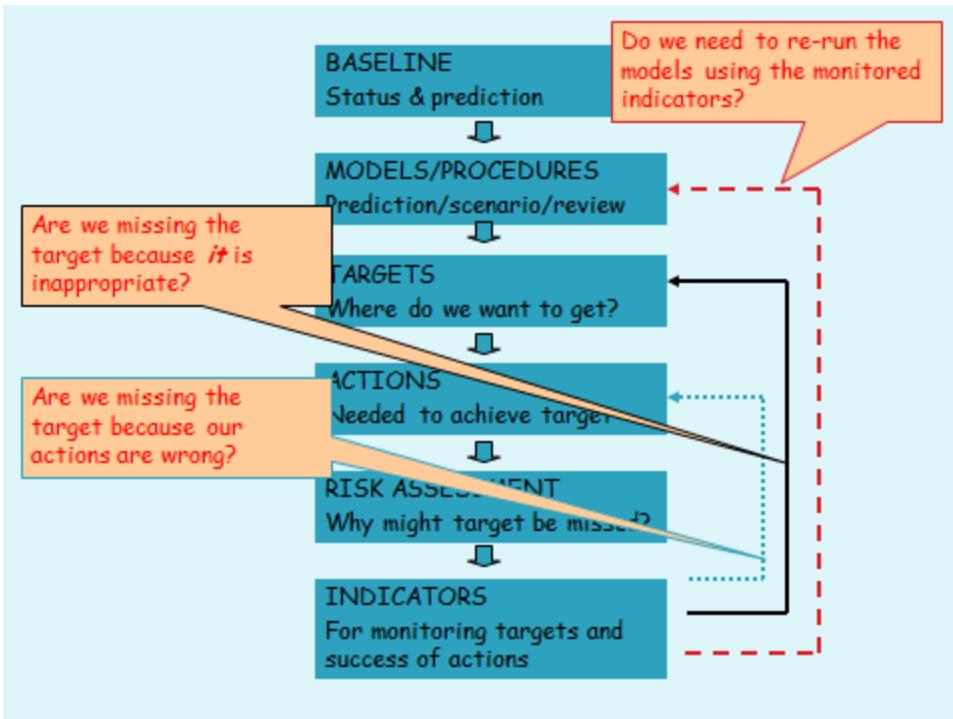
GeoData – sharing best practice



GeoData – scope and approach

GeoData – scope and approach





Stages in the argument

- 1 • Local knowledge & CC adaptation
- 2 • Data, tools and technologies
- 3 • Making the system work for Tanzania
- 4 • Next steps

Mainstreaming climate change adaptation in drylands development planning in Tanzania
Arusha, Tanzania 25-27 January 2012

Data, tools and technologies

- Data and Information
- Data Gathering
- Spatial Data
- GPS
- Satellite data

- Managing Data - GIS
- Analysing Data
- Visualising Information

Data and Information

- Data becomes Information when it is given context
- Information is the basis for decision making
- Information will not solve a problem in its own right

Gathering Data

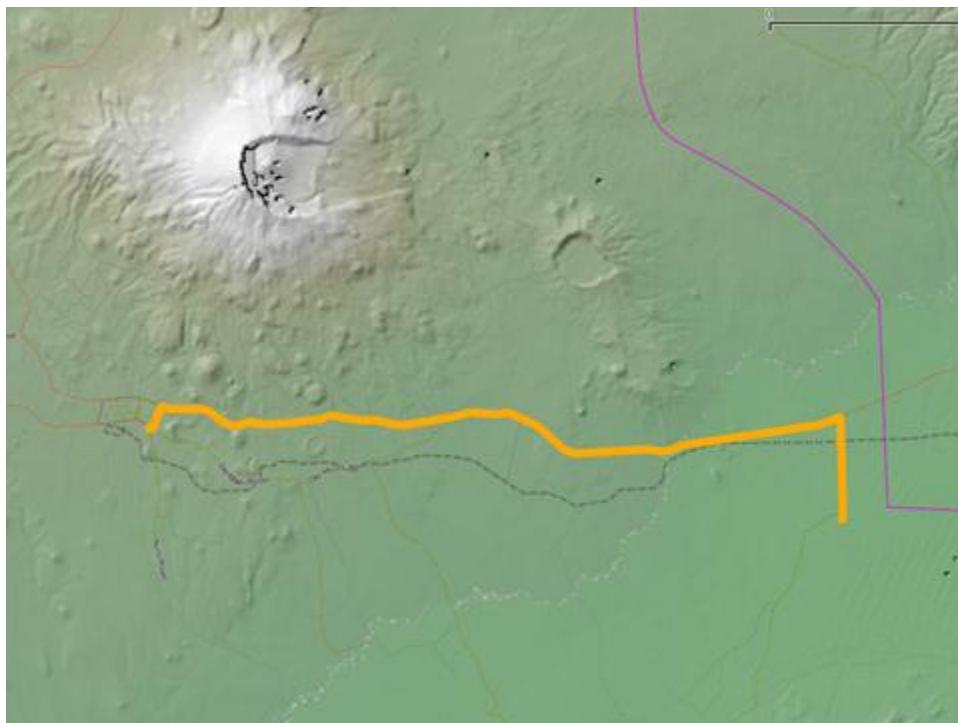
- Workshops and Consultations
- Questionnaires (Census)
- Participatory exercises
- Observations
- Measurements

Gathering Spatial Data

- The majority of data gathered has an element of location:
 - Temperature, rainfall
 - Water sources
- Surveying
- Drawing on an existing map
- GPS

Global Positioning Systems

- Satellite based transmitters
- Portable receivers
- Consumer model accuracy: 2-10m



OpenStreetMap 'Crowdsourcing'

- Participative mapping on the internet
- Users have voluntarily contributed all the data and in doing so, agree to allow others to use it without cost
- Data collected is driven by the users

Southampton University



Arusha



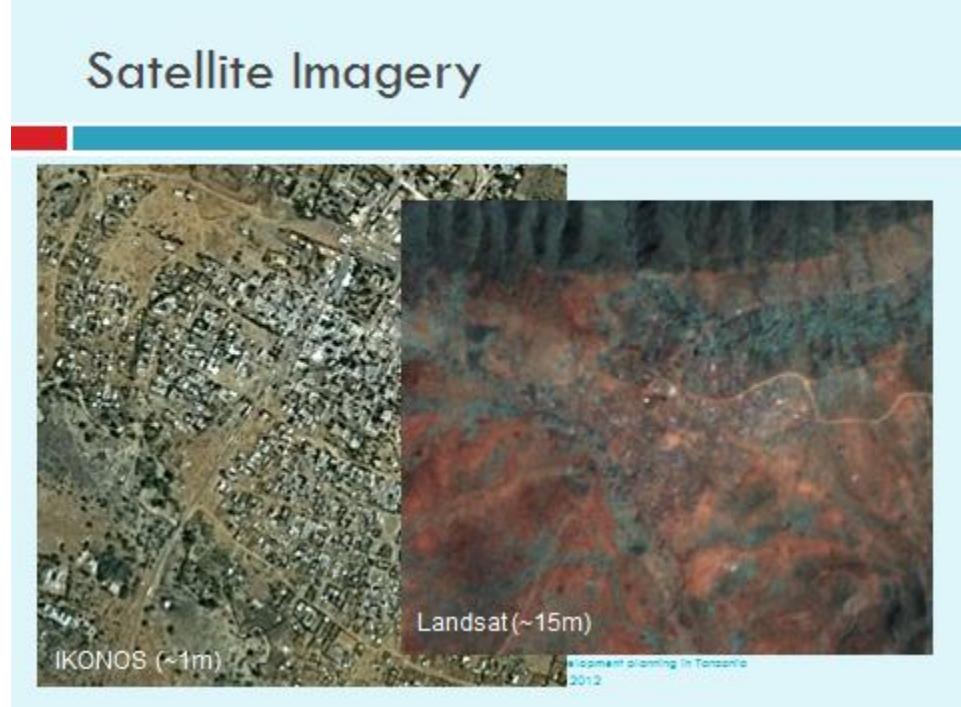
SMS based data

- SMS offers a simple and reliable means of communication
- Software like FrontlineSMS allow SMS communication to be organised using just a laptop and phone
- Used in Tanzania to give advice and weather reports to farmers in Karagwe

Remote Sensing Data

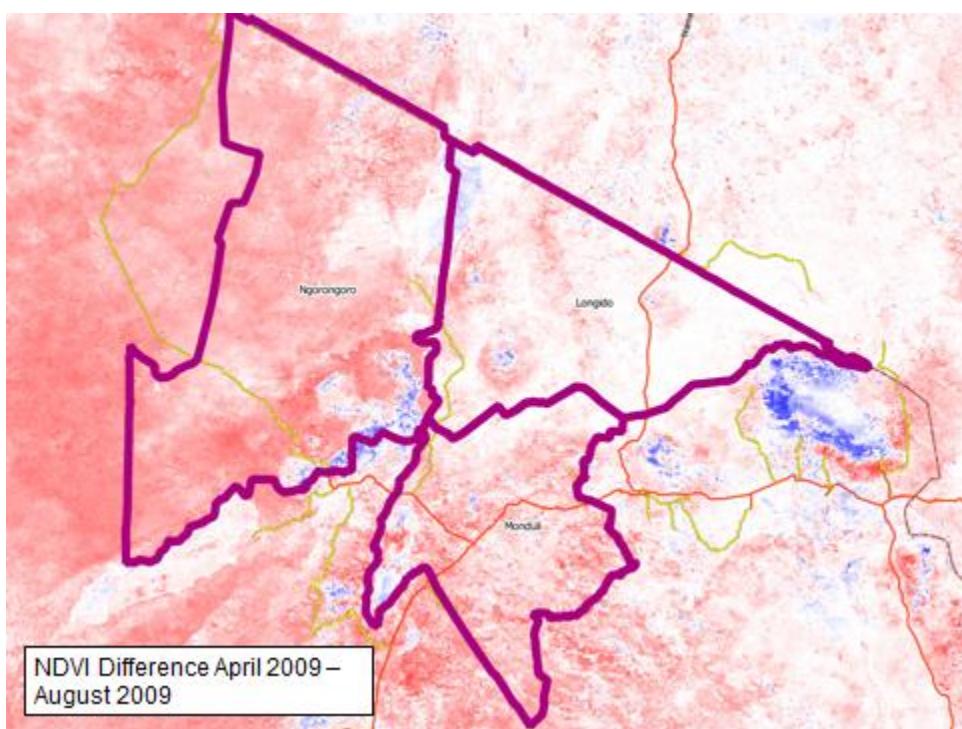
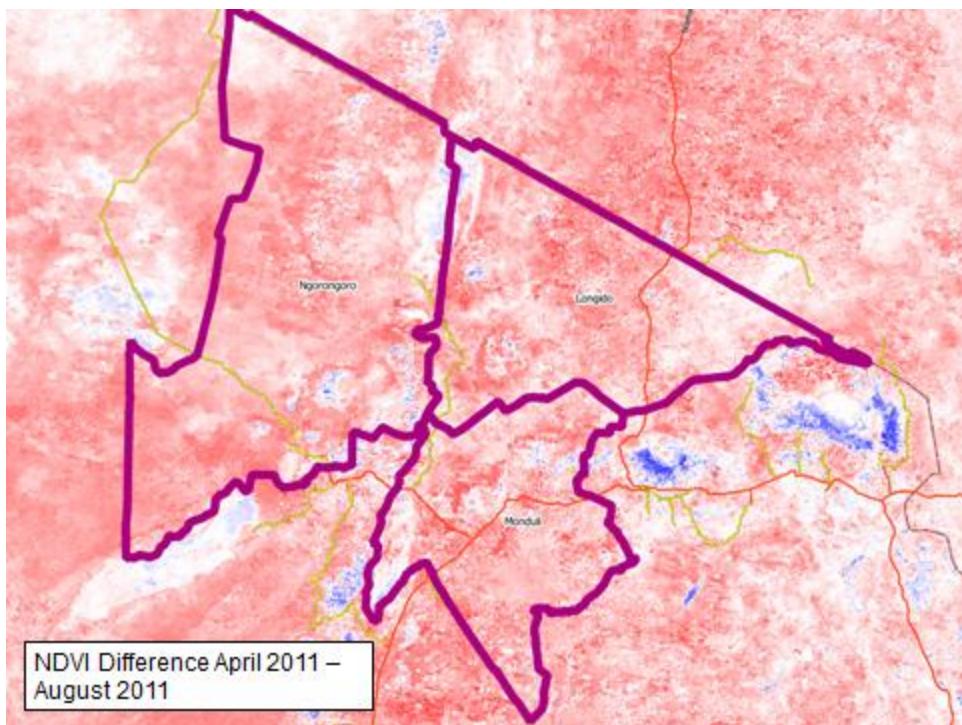
- Plane or satellite based sensors recording images of the Earth's surface
- A lot of images are freely available on the internet from organisations such as NASA
- Higher resolution images are available, but rarely freely
- Archives of past images allow changes to be observed over time, and trends to be calculated.

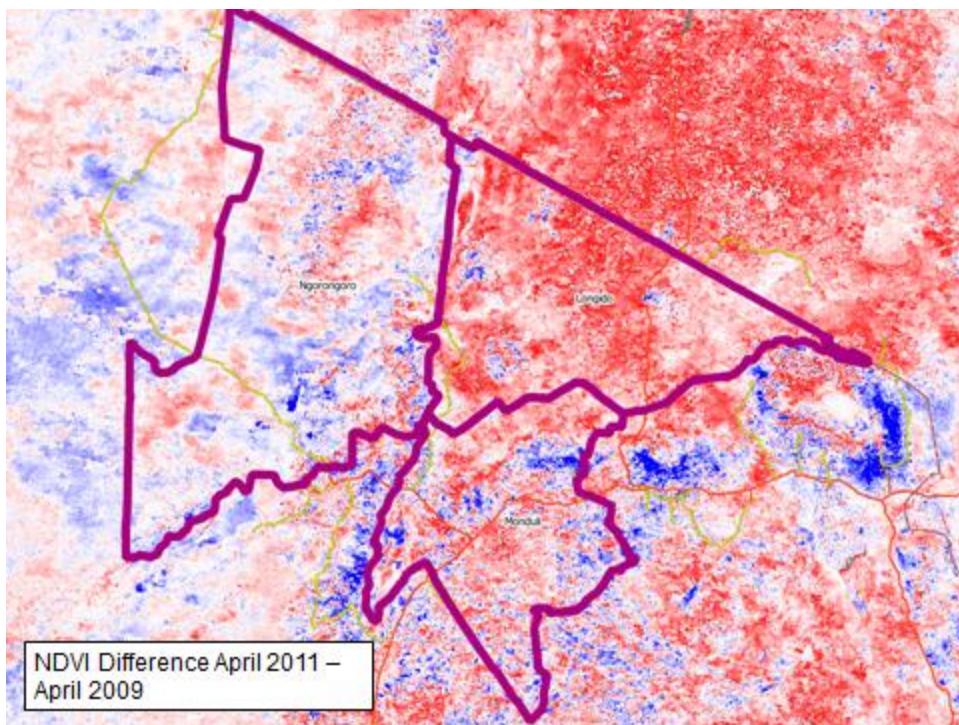
Satellite Imagery



Vegetation – visualising change

- NASA satellites carrying the MODIS sensor
- Data collected allows the calculation of a measure of vegetation cover – the Normalised Difference Vegetation Index
- Published twice monthly, archive dating back to 2000





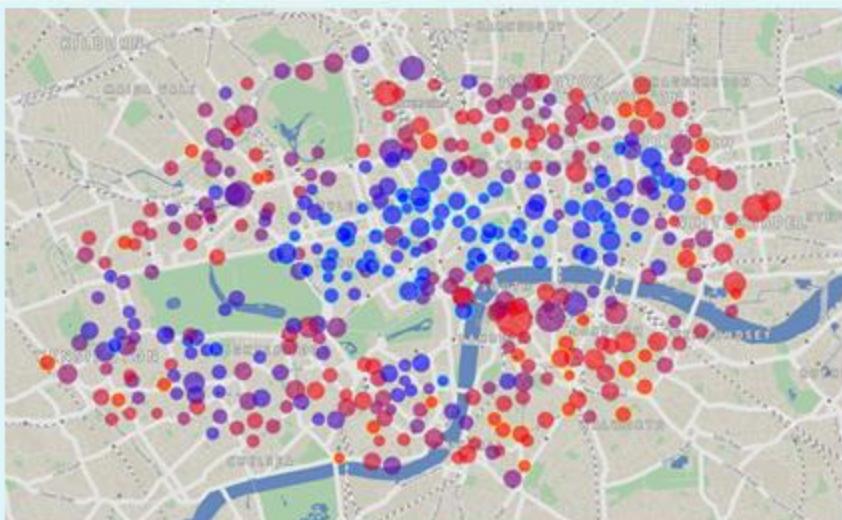
Managing Spatial Data – GIS

- Geographic Information System
- A specialised piece of software for working with all aspects of spatial data: Loading, storing, analysis and display
- More powerful and flexible than traditional paper based mapping
- Increasingly internet based, such as OpenStreetMap and Google Earth

Analysing Spatial Data

- Analysis is often a key part of the conversion of data into information
- GIS software provides a standard analysis toolkit, plus the ability to create tools yourself
- Multi-criteria analysis – assists in ranking options
- Scenario analysis – explores 'what if' situations

Visualisation



Stages in the argument

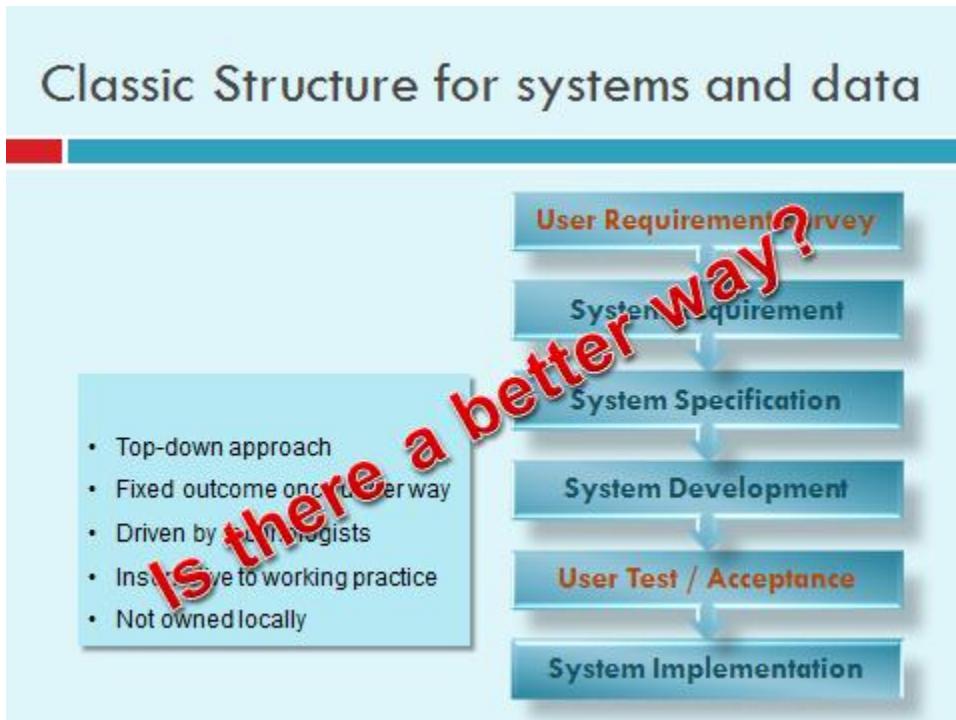
- 1 • Local knowledge & CC adaptation
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Mainstreaming climate change adaptation in drylands development planning in Tanzania
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Info Systems are only used if . . .

- There is a specific and recognised **management need and demand** for them (*present problems*)
- There is an identified position in an **existing management structure** or management workflow

- There are specific **Champions** in the stakeholder organisations with a real interest in the change (incentive)
- There is a highly structured **dissemination programme** in the language of the user



Linking with the stakeholders

- Seeking **convergence of interest** between users and providers of information at all levels – national, regional and community
- Achieving **mutual understanding** and respect (common targets and language)
- Managing expectations** on both sides, and synchronising timescales
- Achieving **practical targets** through consultation testing and review (adaptive management)
- Creating **local ownership** of sustainable land management through responsible practices

User-driven system development

Local management questions/tasks

- Collected and refined through consultation

Local knowledge/data

- Collected through consultation – local and national

Existing management structures

- Possibility to audit/adjust local structures later if desired

Existing skills and facilities

- Supported by comprehensive capacity building

There **is** a way forward, and you have already started on it
– system development informed and driven by local knowledge and local users



Mainstreaming climate change adaptation in drylands development planning in Tanzania
Arusha, Tanzania 25-27 January 2012

What are the aims of this work?

- Maximise the involvement of stakeholders at the planning stage so as to win their active support for implementation
- Hotspots for climate-change vulnerability? Where are the most at-risk places: what are the most at-risk sectors?
- A traffic-light system for state of grazing and status of water supply? Early warning and emergency response?
- Help to select priorities for policy development, management intervention and investment?
- Provide a focused structure for the monitoring that drives adaptive management and oversees project success?
- Audit and avoid conflicts between sectors (administrative and on-the-ground)?

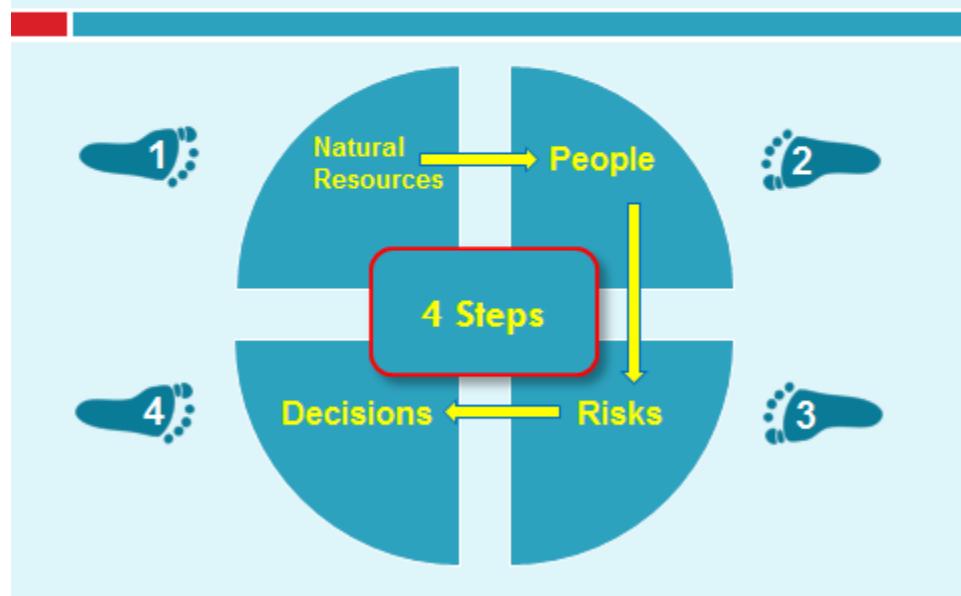
Advantages of user-driven approach

- Accepts that user requirements evolve through time so the system must evolve too
- Gives better development investment control by avoiding “blind alley” developments
- Builds an application-ready user community and avoids the implementation gap
- The product and project “champions” are users rather than external “experts”

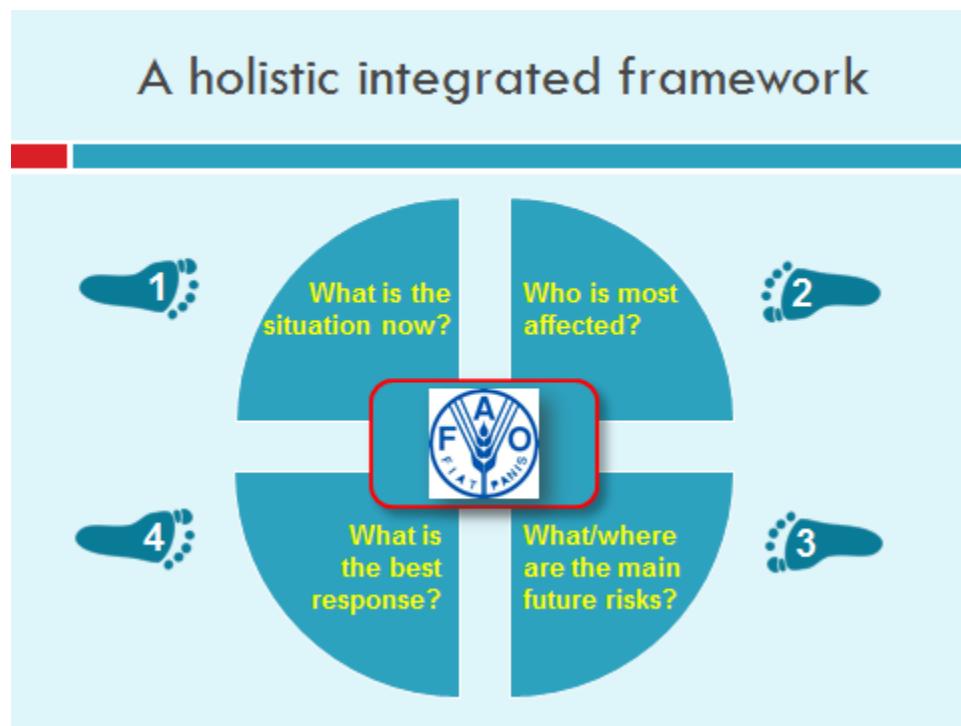
- The simultaneous development, testing and user readiness mean a shorter implementation cycle and accelerate return on investment

Building a data-to-policy structure

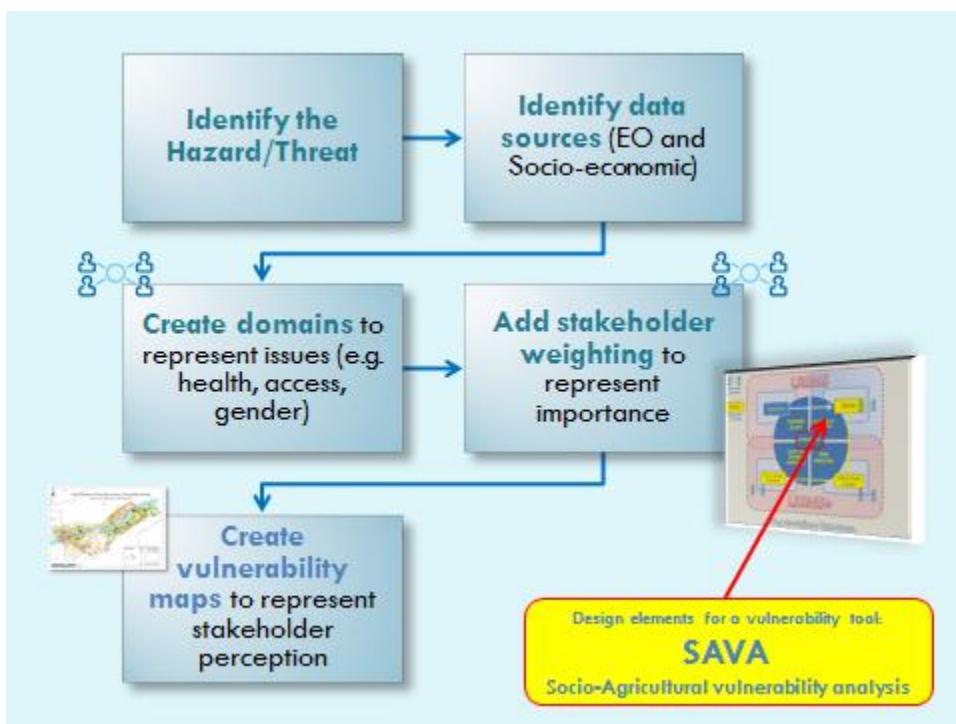
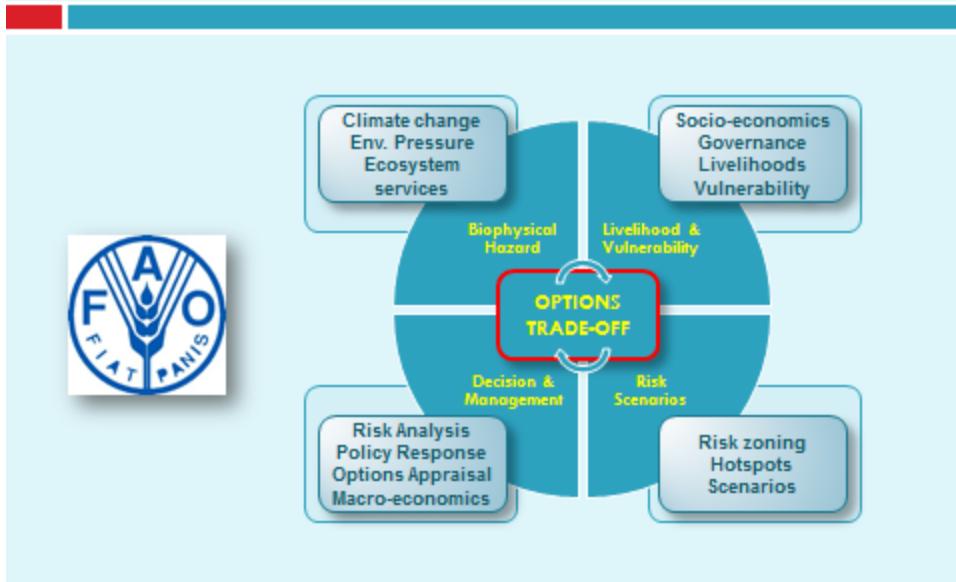
Building a data-to-policy structure



A holistic integrated framework



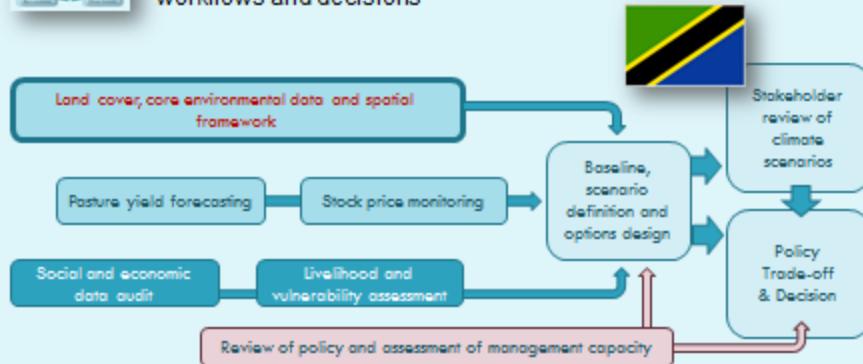
A resource management structure



From structure to local workflow



The generic resource management structure is customised by project and in-country teams to build locally-appropriate workflows and decisions



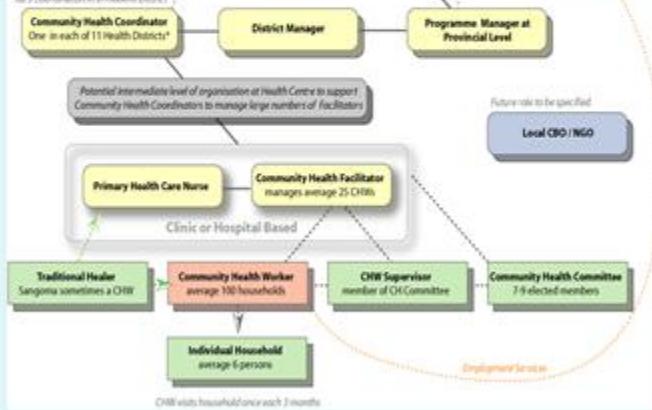
An example of a country-specific resource management workflow

Applying the model: CHW

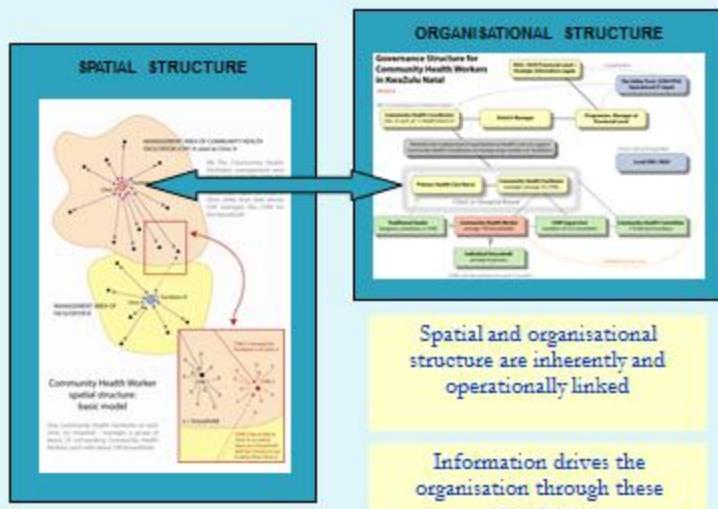
Governance Structure for Community Health Workers in KwaZulu Natal

Version 6

* NB 3 Coordinators in all Districts



Geography and governance



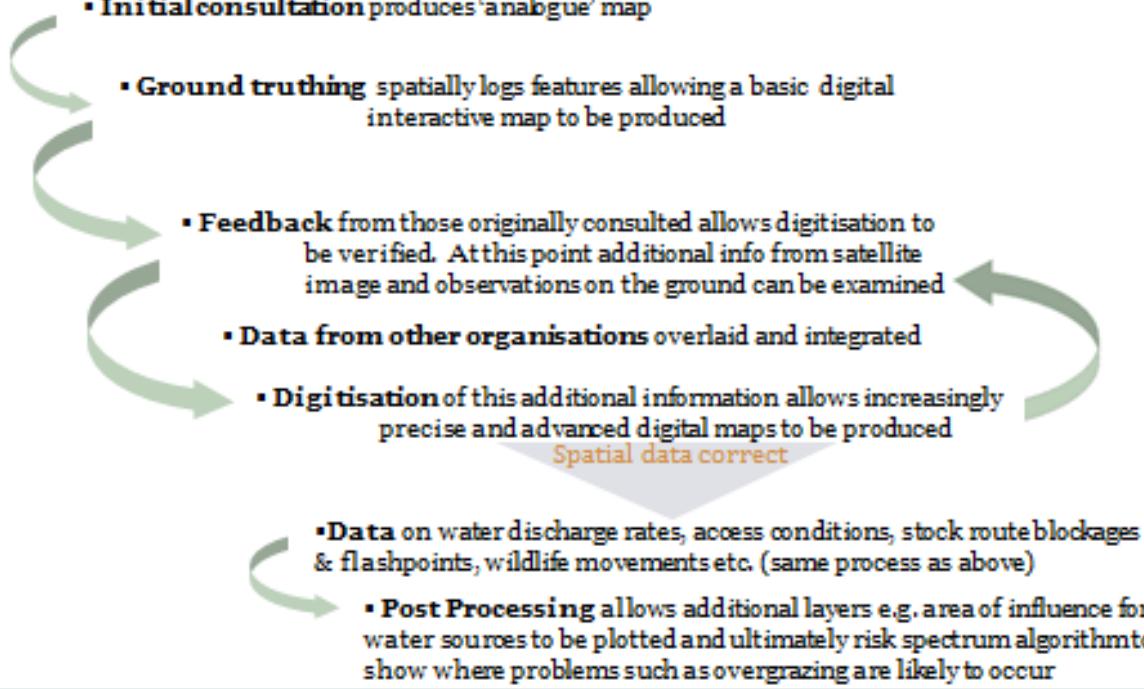
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Arusha, Tanzania 25-27 January 2012

Tom Rowley's Next Steps

Next Steps: Including and Processing Additional Data, Expanding Study Area and Ensuring Precision of Existing Data



IIED/TNRF

Tom Rowley

Adding a broader agenda

PROJECT STEERING GROUP WILL SPECIFY OPTIONS SUCH AS:

- Shortlist tools for info pilot to be user tested
- Build a "business case" / user aims & questions
- Develop a pilot information product / identify pilot users
- Consult on data, skills and resources of users
- Enhance user capacity as required
- Undertake brief pilot and review

Rising to the challenge



Annex 12: IUCN, CCIAM presentations

- **IUCN : Experience and Lessons Learned from Climate Change and Development Project 2008 – 2011, Presented by Abdalla Shah**

Background:

- The project was developed as result of the IUCN climate change preliminary work in Zambia funded by Ministry of Foreign Affairs of Finland
- Started with the Pilot Phase in Zambia , based on the lesson learned extended to three countries
- Coverage area - Tanzania, Mozambique and Zambia as a regional project
- In Tanzania the project covers Kikuletwa catchment in Pangani river basin and Lowe Rufiji.

Achievement

- Result 1: Policy Influence: Engage with the Government. Lessons learned from the implementation of adaptation activities shared through workshops and reports.
- Result 2: Capacity Building: Conducted number of trainings to Communities, professionals and policy makers. Vulnerability Assessments.
- **Result 3 supporting adaptation activities: Small scale irrigation** was both practiced in the project sites (Nyamwinywili village in Rufiji District and Shambarai Burka in Mbuguni village. **Water shed management** in Nyamwimbe village including the water shed management plans. **Rainwater Harvesting Feasibility study** in Arumeru and Simanjiaro districts. A sample of five villages were assessed (Shambarai Burka, Mbuguni, lake Tatu and Msitu wa Mbogo were villages from Arumeru district and Obil village was from Simanjiaro district). The study is adopted by Meru district council for the mainstreaming to the district development plans.
- Result 4: Policy linkages: Information sharing and simplifying national strategies e.g. NAPA.

Lessons learned from Tanzania

- Awareness creation before implementation created a good relationship among community, partners and project.
- Planning meeting with the village government to create feeling of ownership of the project(participatory approach)

- Lessons on undertaking vulnerability assessments
 - Use of more than one tool to capture baseline information on vulnerability. CRISTAL is useful in identifying sustainable coping strategies.
 - Important to capture multiple forms of vulnerability – the process of compiling results into CRISTAL analysis, gender specific elements were lost.
 - Integration of indigenous knowledge (important to link traditional knowledge with climate technical science).
 - Implementations of adaptation measures need time and investments.
 - Need for wider scope of observation and planning
 - Consider wider ecosystem, e.g. in watershed management to protect the water flow
 - Conflict management among resource users e.g. water users
 - Potential of technology to adapt e.g. Application of the rainwater harvesting technology to support irrigation as the alternative source of water
 - Linking income generating activities and cost sharing to cope with the impact of climate change
 - Potential of diversification of land use and varieties of crops
 - Linking practice to policy – field pilots to national level. Practice should inform policy
- **Climate Change Impacts, Adaptation and Mitigation in Tanzania (CCIAM) Programme, Jumanne Abdalla**
 1. A partnership: URT & Kingdom of Norway.
 2. Duration: 5 years (2009 – 2014).
 3. Collaboration
 - Tanzania: SUA, UDSM, ARU & TMA
 - Norway: UMB, UIO-Oslo, CICERO, NILF

Main Objective:

- To develop and sustain adequacy in national capacity to participate in climate change initiatives and address the effects and challenges of climate change with particular emphasis on REDD initiatives.

Focus Areas:

A: Research

- **Implementing 15 research projects**
- **Address three themes**
- ❖ **Development of appropriate strategies (climate change mitigation and adaptation in forestry, other land uses, ecosystems and biodiversity management)**
- ❖ **Assessment of climate change impacts (on and vulnerability of ecosystem services and livelihoods under REDD initiatives)**
- ❖ **Analysis of policy and legal framework (of climate change adaptation and mitigation with emphasis on economic efficiency, ecological effectiveness and wider political legitimacy)**

15 Research projects

15 Research projects

Project Title	Project Leader	Institution
Quantification, Modeling and mapping carbon stocks and plant diversity in different land cover types in Tanzania	Prof. P.K.T. Munishi	SUA
Development of biomass estimation models and carbon monitoring in selected vegetation types in Tanzania	Prof. R.E. Malimbwi	SUA
Climate change, non-timber forest products and livelihood of forest dependent communities: impacts, vulnerability and adaptation in selected parts of Tanzania	Dr. S. Augustino	SUA
Developing fire reduction strategy for Miombo woodlands as a potential tool for carbon storage and sequestration	Prof. S.S. Madoffe	SUA
Comparative study of incentive options for forest-based emissions reduction, biodiversity conservation and livelihood improvement; a case of Kilwa and Rufiji Districts	Prof. K. Kulindwa	UDSM



CCIAM

Project Title	Project Leader	Institution
Economic valuation of incremental biomass under PFM and its potential to serve as Management incentives under REDD	Dr. L.P. Lusambo	SUA
Establishment of harmonized modalities and mechanisms for community compensation and carbon markets; The case study of REDD Pilot Projects in Tanzania	Dr. R.S. Shemdoe	ARU
REDD Architecture in Tanzania: Assessment of REDD options for livelihood security and sustainable development	Dr. A.B.S. Mwakalobo	SUA
Governance, incentives and monitoring in REDD-GIM-REDD	Prof J.F. Kessy	SUA
Governance challenges in REDD Implementation in Tanzania: Experiences from participatory Forest Management in Manyara and Lindi Regions	Dr. F. Maganga	UDSM



CCIAM



Project Title	Project Leader	Institution
The role of local government in implementing REDD	Dr. J. Kingori	UDSM
The role of indigenous knowledge in community adaptation and mitigation response to the impacts of climate change in Tanzania	Dr. A.L. Kijazi	TMA
Implications of REDD on smallholders' livelihoods through access to land in Manyara region: mapping and assessment of challenges and opportunities	Dr. A.E. Majule	UDSM
Analysis of the impacts of urban land use and climate change on coastal forest ecosystems and management	Dr. J. Lupala	ARU
Impact of climate variability on fisheries and mangrove ecosystems based mariculture along the Tanzania Coast	Dr. B.V. Mnembuka	SUA



CCIAM

Second Call for Research Project

- The concept notes for the second call have been received and are under review.
- This call shall focus on thematic areas 1: *Development of appropriate climate change mitigation and adaptation strategies in forestry, other land uses, ecosystems and biodiversity management.*
- Covers areas that are not addressed in the on-going research activities. The areas include:
 - Modelling of impacts of climate change and management scenarios in forestry, land-use, ecosystem and biodiversity.
 - Assessment of innovative agricultural land use and farming systems for adaptation to and mitigation of climate change to support REDD initiatives.
 - Development and testing of various range land management strategies for the purpose of reducing pressure on forest resources for adaptation and mitigation to climate change.

B: Strategic Intervention

- Implementing five projects:
 - ❖ innovation to reduce C emissions from agricultural activities,
 - ❖ Vulnerability assessment and macroeconomic modelling studies
 - ❖ innovation to increase C sinks,
 - ❖ introduction of alternative energy sources,
 - ❖ Strengthening Documentation, Communication and Dissemination of CCIAM Information

C: Communication and Publicity

- Programme website uploaded (www.suanet.ac.tz/cciam)
- CCIAM Newsletter Vol. 1(1) published and distributed
- SUA VC interviewed on programme activities by TBC1 radio on 23rd May 2011

D: Capacity building:

Human Resource:

1. Training 50 Masters and 17 PhD scholarships
2. Special skills in modelling (for technicians and scientists)

3. Scholar exchange (senior and junior)
4. Planned to revise curricula to include climate change
5. Short courses and dissemination workshops

Infrastructure:

1. GIS laboratories strengthened (hardware & software procured)
2. Internet services strengthened (equipment procured)
3. Five vehicles procured

Linking Research Project with REDD Pilot Projects

- Workshop involving researchers and participants from NGOs implementing REDD pilot projects held in December 2010.
- TFCG, JGI, TaTEDO, WCS; WCST, Mpingo Conservation NGOs represented
- All 15 Research projects being carried out in REDD pilot project sites

Challenges

- Not all key collaborators were involved during preparation of CCIAM programme
- Late start of REDD+ pilot projects
- Demand for training and research is higher than the programme can absorb (345 Masters and 70 PhD applicants)
- Coordination of many institutions

Opportunities:

- Stronger inter-institutional collaboration
- Strong participation of key stakeholders in programme activities (Department of Environment, FBD, Agriculture, COSTEC, Livestock etc.)
- Fund is available to participate in meetings/workshops/conferences
- Collaboration with NGOs and communities
- Profile of CC issues among development partners increased
- Opportunities to publish in international journals enhanced by the programme

Sustainability

- Training scholarships were awarded to all collaborating institutions and environment line ministries
- Working closely with NGOs and communities in national pilot areas
- Strengthened communication in climate change in collaborating institutions (Documentation project)
- Involvement of junior and senior scholar in exchange programmes
- Participation in international meetings dealing with CC
- Infrastructure strengthened (GIS, Internet, Labs equip.)
- Metrological station networks strengthened

Annex 13: Expectations of the meeting (concerns/hopes)

- Identify what **role** various stakeholders/participants can play
- **Draft plan** for the activities which will be carried out now and up until the start of the project.
- Identify who will be performing what tasks/**responsibilities**.
- To be clear on HOW the funds will be spent- **budget and budget allocation**- given large amount of different stakeholders.
- Clarity on the **objectives** of the activities themselves.
- Very clear on the **target**. Beneficiaries. Who are we trying to reach? What do we want to achieve.
- **Structures And Roles:** Tentative structure for district teams and inter-district teams, Roles and responsibilities of the secretariat – terms of reference.
- **Timetable**

- **Outputs and indicators, M & E**
- **Strategies community sensitisation + bringing together districts**
- **Learning**— what documents produced and disseminated, simple formats that people can follow. Communicating- language? Swahili and English.
- **Reaching national level and community level**
- **Anticipated risks/challenges**
- **CC strategy**
- How do we link into the **new constitution**

→**Agenda** for the day (drawn up by all participants' expectations):

- **Presentation/overview of project activities**
 - Objectives/outputs (included M & E and the indicators)
 - Roles/responsibilities
 - Budget
 - Timetable
- **Structures:**
 - Approach
 - Principles
 - District teams
 - Inter-district teams
 - Inter-district + national
- **Links** across local-district-national (learning)
 - Constitution
 - CC strategy
- Preliminary ideas about how we go about **funding** for the next phase
- **Learning**
 - How do we capture
 - How do we communicate

