SPATE IRRIGATION LEADERSHIP COURSE

Protea Hotel Moshi

7th to 11th March 2016

Understanding the upstream – downstream institutional linkages and flood-water sharing

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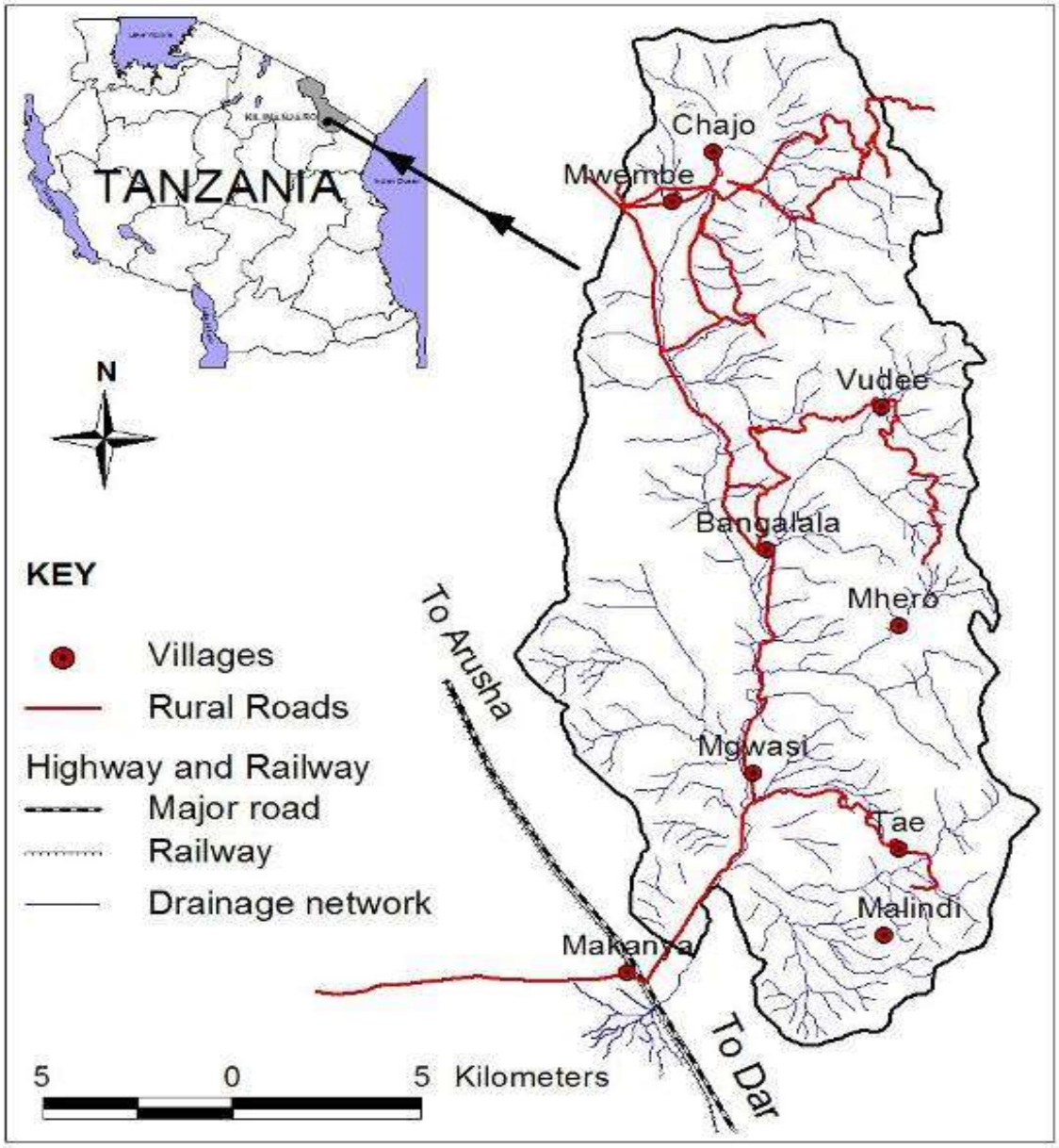
Makanya sub-catchment

Location, size and population

- **The watershed lies between latitudes 4º 15' to 4º 21' S and longitudes 37º 48' to 37º 53' E.**
- **The watershed covers an area of about 975 km^2.**
- **The population in the Makanya watershed is estimated to be 35,000 and is rapidly growing with an estimated growth rate of 1.6% per annum (URT, 2004).**
- **About 90% of the population in the catchment live in the highlands, of which, 80% depends directly or indirectly on agriculture**


TANZANIA
N
KEY
Villages
Rural Roads
Highway and Railway
Major road
Railway
Drainage network
5 0 5 Kilometers
Chajo
Mwembe
Vudee
Bangalala
Mhero
Mgwasi
Tae
Malindi
Makanya
To Arusha
To Dar

Source of conflicts and parties involved

- **The major problem and conflict between different user interests within the catchment is a result of the limited amount of water available against different high demands.**
- **Small scale conflicts occur among crop-farmers upstream against those downstream.**
- **Small scale conflicts occur among crop-farmers upstream against livestock keepers.**
- **At large scale the conflicts were between the sectors of agriculture (food production) and hydropower production.**

Conflicts cont.

- Conflicts over water are increasing in the **Makanya sub-catchment** in north-eastern Tanzania as farmers and herders jostle for dwindling water resources in the face of climate change.
- The conflicts involve: **Farmers vs farmers** [in upstream/middle and lowland farmers]; **Upland vs downstream farmers**; **Crop - Farmers vs livestock keepers**
- Over the past decade, Maasai pastoralists from the northern areas of Moshi and Arusha have been streaming towards the basin with tens of thousands of their cattle in search of water and grazing pasture.

Conflicts cont.

- **Tensions between farmers and herders have been ongoing and many residents feel that there is no end in sight.**
- **The most recent incident according to residents, was a scuffle involving farmers and pastoralists which ensued when 24 herders attempted to take over the village's central water source in order to feed their animals.**
- **The villagers managed to remove them and no deaths were reported.**

Who gets the water first?

- **Some farmers in Makanya village make sure the runoff touches their feet first to claim ownership as first user**
- **To achieve this they sleep with their feet in the river to be awakened by the flow**


EXPRESS

Introducing DIALOGUE in the Makanya sub catchment

- **Experience shows that conflict resolution and prevention (on water-related conflicts) can be achieved through dialogue processes.**
- **Dialogues forums strengthen local users associations and stimulate formation of new ones, and foster relationships between the government and communities.**
- **Dialogues have a better chance of success if they are initiated prior to a crisis situation. They should include an analysis of the conflict, relationship and trust building, negotiating solutions and action plans and joint implementation of the action plans.**
- **They also require time and resources and increase the transaction costs of resource management.**
- **People need to have a stake (ownership) in resources as an incentive to use the resource sustainably.**

Dialogue cont.

- The more inclusive the process is, the more sustainable and equitable the outcome will likely be.
- Traditional governance systems of dealing with water conflicts should be recognized and accommodated as much as possible.
- The co-existence of legal and illegal resource users hinders the willingness to negotiate equitable solutions, therefore all should be involved.
- It is necessary to involve and clarify the roles and responsibilities of all different institutional arrangements (national, regional, district, local).
- It is necessary to use a site specific approach, taking into account history, current politics and market forces, population demographics, and effects of climate change

Introducing the River Basin Game (RBG) as a dialogue tool

About the RBG

- The River Basin Game (RBG) is a large board placed on a slope with a 'catchment' at the top end and a 'wetland' at the bottom end.
- The river flows between these two, and has on it several intakes into irrigation systems of varying sizes.
- Being at the top of the river advantages some of the irrigation systems, while others are tail end systems.
- The river 'flows' when a large number of glass marbles are released down the river. The marbles are like water.
- Participants put small sticks (like weirs) across the river to capture these marbles and scoop them into the irrigation systems where they sit in small holes - thereby meeting the water requirement of that particular cropping pattern.
- The RBG is a powerful tool for creating awareness on various water issues and the need to address water problems in rational manner.

The RBG BEING PLAYED IN NIGERIA

THE RBG WORKSHOP results from MAKANYA VILLAGE, 24th-25th October 2005

- the RBG was used as a tool to engage stakeholders in analysing key water resources issues and problems in the Makanya sub catchment.
- 42 participants attended the workshops. selected from upstream, mid stream and downstream villages.
- They included local level water users, extension staff as well as representatives of NGOs dealing with water resources management.

Results of the deliberations

After lengthy and exhaustive deliberations during plenary sessions, the following issues emerged.

- **Individual strategies to obtain marbles (search for water)**
- **Destruction and vandalisation of upstream intakes**
- **Guarding of water abstraction structures to ensure that water is conveyed into fields without interruptions**
- **Diverting water from other users bunded basins by destroying the raised bunds**

cont.

- **Frequent cleaning of irrigation canals**
- **Reduction of the number of intakes**
- **Engaging upstream water users in dialogue so that they release more water to downstream areas**
- **Establishment and adherence to rotation irrigation schedules among intakes and within irrigation canals**

Strategies to increase productivity of water so as to save water

- **Improvement (modernisation) of existing intakes**
- **Regulation and control of water abstraction by upstream intakes**
- **Construction of water storage structures e.g. tanks, charco dams and surface ponds (*ndiva*)**
- **The use of small scale appropriate irrigation technologies such as drip irrigation**

cont.

- **Institution of rotational irrigation schedules**
- **Frequent cleaning and desilting of canals and *ndivas***
- **Introduction and intensification of in-situ rainwater harvesting technologies such as construction of ridges and terraces**
- **Engaging upstream water users in dialogue so that they release more water to downstream areas**

Local solutions to water sharing

- The rates of fines imposed to defaulters should be reviewed to match with the gravity of the offence, socio-economic set up of the area and the prevailing costs of living. This will act as a deterrent to habitual defaulters and will discourage people from breaching the by laws
- The enacted bylaws should be enforced and defaulters should be taken to task as soon as they commit the offence. In order to facilitate this, all villagers should feel responsible to safeguard the bylaws and expose those who try to undermine the bylaws.
- Undertaking proper catchment conservation
- Institution of rotational irrigation schedules

cont

- **Formation of sub catchment water users association to oversee water allocation and management**
- **Banning bathing, washing clothes and farming near or close to water sources**
- **Uprooting of alien ‘water-sucking’ trees and planting of indigenous trees around water sources**
- **Prohibiting grazing of livestock near water sources**
- **Banning wanton tree felling**
- **Construction of flow measurement devices in rivers and canals to control the amount of water being abstracted**

Water flowing in the Makanya river on 4th March 2016

Makanya river, Dry on 5th March 2016

Some group exercises

GROUP 1.

- **Develop the vision or scenarios for water sharing under different hydrological regimes Scenarios – what is balance of water? How to decide?**
- What is the past, current and future shares of water?
- What should be the future allocation of water?
- How do we know whether we have met the share of water? What indicators are necessary?
- Options: Equal ? According to area? According to population? According to historical precedent?
- What should be the principles to decide *changes* in allocation
- Wet years and dry years, wet seasons and dry seasons

GROUP 2

- **Review existing and new institutional & legal mechanisms, including monitoring and enforcement;**
- **Institutional/technical mechanisms to support decisions**
- Which institutions are required here? Do they already exist? What new institutions? What new agreements? What support can be obtained from the institutions?
- What new procedures are necessary for guiding negotiation over water?
- Monitoring/enforcement

GROUP 3.

- **Review adequacy of technical means to control, share, distribute and save water while maintaining productivity. Technical ways to save and spread water**

Notes:

- what means can be agreed to control and share water whilst maintaining productivity
- Dry season vs wet season
- What bye-laws and agreements already exist?
- What new agreements can be made to improve the spreading and control of water?

Group

1) **Develop the vision or scenarios for water sharing under different hydrological regimes Scenarios – what is balance of water? How to decide?**
2) **Review existing and new institutional & legal mechanisms, including monitoring and enforcement; Institutional/technical mechanisms to support decisions**
3) **Review adequacy of technical means to control, share, distribute and save water while maintaining productivity. Technical ways to save and spread water**

Thank you for your attention