

Presentation given the TransLinks workshop:

Modeling and Managing Watersheds

September 13-16, 2011

Kigali, Rwanda

Umubano Hotel, Boulevard de l'umuganda

This workshop was hosted by the Wildlife Conservation Society, the United States Forest Service (USFS) and the United States Agency for International Development (USAID)



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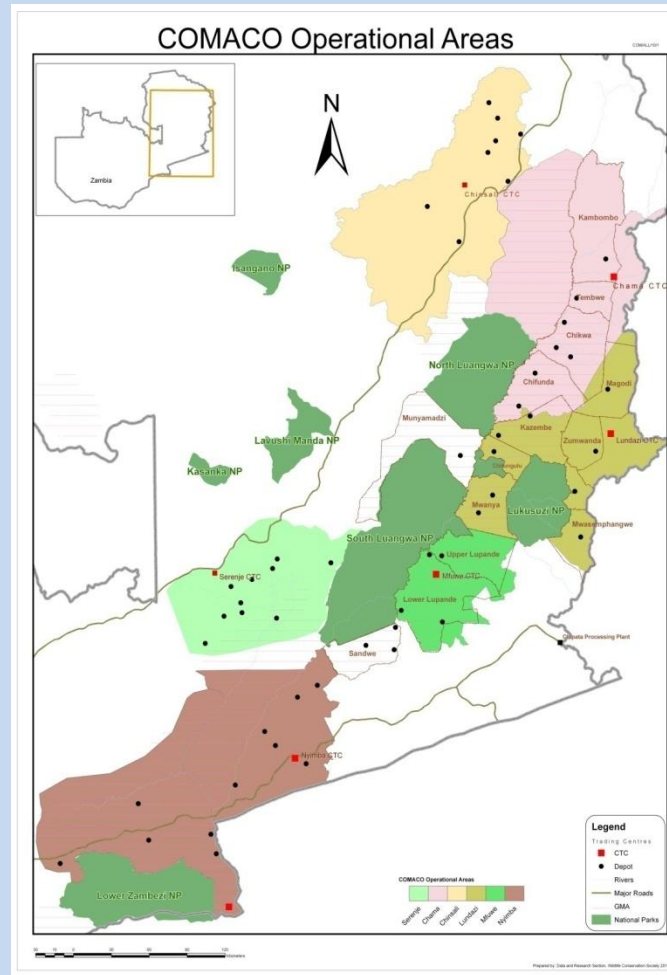


**Modeling and Managing Watersheds
Workshop Agenda
September 13-14, 2011**

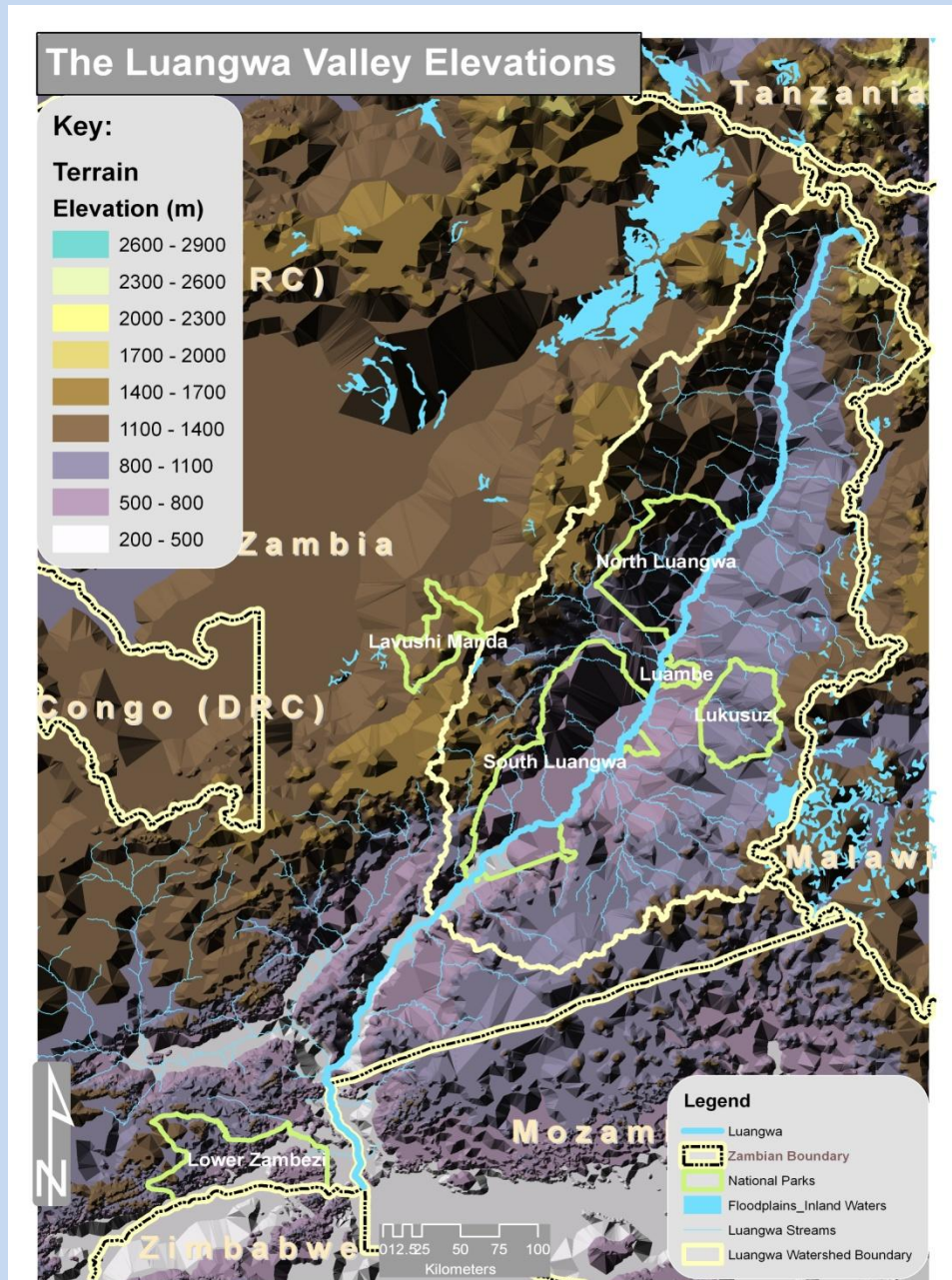
Outline

- Ecological Context of Site
- Climatological Context
- Hydrological Systems
- Socio-economic Conditions of the Landscape
- Water Resource Management Issues and Policies
 - National Scale
 - Landscape Scale
- Key Questions that this Project Aimed to Address at the Landscape

Luangwa Valley: The Greater Part of COMACO's Areas of Operations



The Luangwa Valley: greater part of COMACO's Areas of Operations



WCS' s History Working in the Landscape

- How long WCS has been there
 - WCS has been there for over 25 years now
 - WCS operates through an economic program called COMACO formed in 2003
- Major conservation activities
 - Poverty, deforestation, and loss of wildlife
 - COMACO provides sustainable sources of alternative incomes such as farming and other conservation incentives to families living around National parks in the Luangwa Valley

- COMACO links membership in the cooperative business with wildlife conservation by having new participants turn in their guns and snares
- The program has trained more than 40,000 farmers, who have voluntarily turned in 61,000 wire snares and 1,467 guns
- More than 1200 poachers have given up poaching voluntarily
- Surplus commodities grown by registered farmers under COMACO are sold under the brand It's Wild!

Ecological Context of Landscape

- **Habitat types**
- The major habit types are the;
 - Tropical and subtropical floodplain rivers and wetland complexes
 - Rivers –Luangwa River as the main River
 - Unregulated and relatively pristine
 - Dry Season: slow-flowing meandering river confined to main channel and winding its way between shallow sand banks
 - Rain Season: flows several kilometers wide and floods large areas of grassland.

Vegetation types:

- Plateau miombo woodland
- Valley miombo woodland
- Scrub miombo woodland
- Scrub and woodland mopane
- The most seasonal woodland is mopane where tree canopy closure ranges from about 15% at the end of the dry season to Over 60% during peak of rains.

Wildlife:

- Luangwa Valley is protected by national parks or GMAs comprising one of the world's greatest wildlife areas

- Luangwa Valley has one of the highest concentrations of game in Africa

- Most wildlife Species include Elephants, Hippos, Thornicroft's Giraffes, (inhabit only the Luangwa Valley), Rhinos, Lions, Hyenas, etc

Disturbances:

- Wildlife to Human conflicts

- Wildfires

Climatic Context

Three distinct seasons:

- A cool dry season from May to August,
- A hot dry season from September to November,
- A warm wet season from December to April.
- In the hot season, daytime maximum temperatures average 27° to 38° C
- Average rainfall ranges from 700 mm per year in the south along the Zambezi River, to approximately 1000 mm in the upper Luangwa Valley

Most of the precipitation falls between November and March

- **Concerns about climate change**

- Increasing Population

- High Dependence of upland communities on watershed resources

- Shifting Cultivation

- Charcoal Making

- Urbanization

Hydrological Context

Luangwa River as the main flow with Tropical and subtropical floodplain rivers and wetland complexes

- Importance of the rivers for wildlife:
 - A habitat for wildlife
 - Water for crops and farm animals
 - The Luangwa river is the life blood of parks

- Importance of the rivers for humans:

- Water for us to drink

- Water for Irrigation

- Transport

- Groundwater availability
 - Growing demand of available water resources in Zambia
 - 9% of Water usage is from ground water and groundwater provides 28% of domestic water supply
 - In Zambia water yields from aquifers are highest within 30m of the sediment strata
 - Typical borehole depths are around 50–70 m below ground level

Socio-Economic Context

- The Luangwa Valley has over 50, 000 households, and 1, 707, 000 people
- 49.4 percent are male and 50.6 percent are female
- Male Household income: Average = \$ 42
- Female Household income: Average = \$ 15
- Livelihood activities
 - Farming, Poaching, Charcoal Making, Fishing
- Natural resource/land tenure
 - Customary and Leasehold tenure

- Importance/uses of water to the communities
 - Drinking
 - Domestic Use
 - Irrigation
- Rules/regulations/policies determining how people use water in the landscape
 - The Water Resources Management bill enacted in 2010

Watershed Management Issues and Challenges

- Economic importance of water locally:
 - Transport
 - Tourism
- Threats to water resources Include;
 - Land use change
 - Severe Soil erosions leading to Sedimentation
 - Change in River flow behavior
 - Pollution from chemical fertilizers washed from farmlands
- Current initiatives aimed at water resource management
 - The 2010 Water Resources Management Bill was enacted to provide for the management, development, conservation , protection and prevention of water resources and its ecosystem

- Challenges to managing water resources effectively:
 - Lack of Policies on the Use and management of water resources
 - Lack of clear rules governing roles of various stakeholders
 - Fragmentation and overlap of mandates of various agencies
 - Lack of watershed research priorities and technology development

Questions this Project Addressed

- Luangwa Valley, Zambia
 - How do watersheds within the Luangwa Valley rank in terms of land degradation?
 - Which watersheds are the most critical in sustaining year-round water flow?
 - What are the impacts of landuse change on water quantity?

Thank you!