

Assessment of Cut-and-Burn
farming system on the
management of Songwe River: a
trans-boundary watershed
between Tanzania, Zambia and
Malawi.

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Presentation Content

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- Instability of the Songwe River Catchment
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Key Environmental Issues

- Songwe River is a trans-boundary River between Tanzania, Zambia and Malawi
- Main source of fish protein and household incomes for about 1.3million rural people in Tanzania and Malawi
- This ecosystem service is under threats by heavy sediment load to Lake Malawi estimated at 5000-7000t/year- the highest of all river systems of the lake

Instability of Songwe River Catchment

- Experience frequent Flooding leading to destruction of human and animal life, and property
- Magnitude and frequency of flooding has increased over past 10-20years
- Changes courses and creates problem of national identity: Tanzanians or Malawians
- Cause of these environmental problem linked to cut-and-burn farming systems in the upper catchments areas of the river

Knowledge gap

- Number of hectarage of cut-and-burn per year and for each of the three territories is not known
- Associated soil and landscape features that promotes cut-and-burn also not well understood
- Policy environment and social economic drivers not well understood

Cultural Homogeneity

- The Nyika people living in bordering areas of the three territories are the principal tribe that practices the cut-and-burn farming
- Observations indicates that there is more cut-and burn in Zambia and Malawi than in Tanzania
- No available quantitative data to support such assertions
- Effectiveness of environmental management policy assumed to be the main cause of differences in the magnitude of cut-and burn farming between these territories

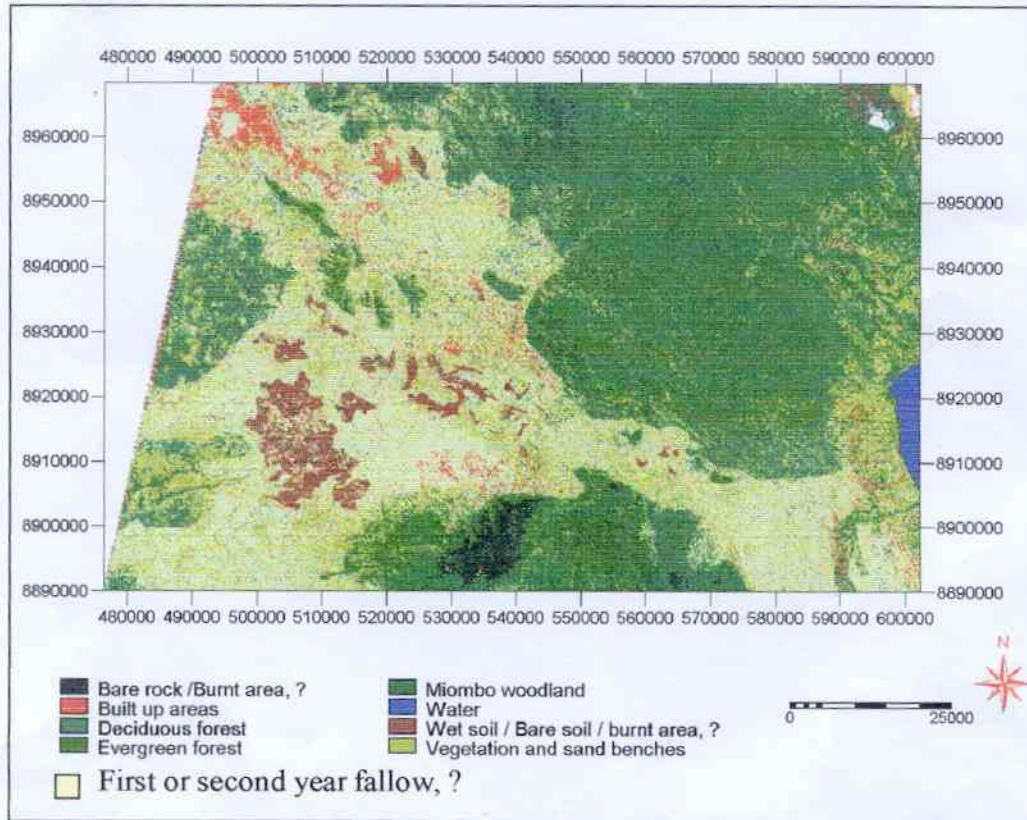
Government Strategy

- The governments of Tanzania, Zambia, and Malawi recognizes the problem
- Government of Malawi and Tanzania has sought support from Norway for Songwe River training project
- Project recommended river training to stabilize course and dams to absorb flooding
- River training option has been abandoned because it could destroy fish breeding grounds
- Both governments agreed for further studies

Methodology

- Global Positioning System could be used to locate the training sites
- Land cover described by PRA and Tree age indices White(1971)
- Supervised classification based on maximum likelihood & NDVI
- Applied on land sat7 imagery using ILWIS
- Matching of the land sat 7 cover map with:
- Shaxson's Vegetation Classification map
- Biotic Community Map of Malawi

CHITIPA AND KARONGA LAND COVER CLASSIFICATION



Results

- Large areas under Motane Evergreen Forest had disappeared in areas with intensive Cut-and burn
- Open canopy woodland of plateau substantially been reduced
- Area under Motane grassland increased
- Built-up areas had also substantially increased

Way Forward

- Carry out a comprehensive study to characterize cut-and-burn farming
- Produce chronological sequence of hectarage under cut-and burn farming for past 10-20 years
- Subject this past annual hectarage of cut-and-burn to multivariate correlation analysis with respect to annual rainfall, sediment load and incidence of flooding

Assessment of Drivers of Cut-and-burn Farming

- Quantify the intensity of cut and-burn in each of the three territories: Tanzania, Zambia and Malawi
- Express annual hectarge of cut-and-burn per km² for each of the territories
- Analysis of Variance(ANOVA) will be used to determine whether the differences in rate of cut-and-burn between the territories is significantly different
- Determine the drivers of Cut-and- burn farming

Summary

- Review the environmental management policies/strategies of the three territories
- Assessment of the household per capita income of the three territories
- Determine hectarage of cut-and-burn under: different soil type, land slope, and moiture regime
- Assessment association of cut-and-burn farming with soil type, land slope, moisture regime using ANOVA

Thank you for your attention