

WORKING TOGETHER TO  
INSPIRE SUSTAINABLE  
SOLUTIONS



# **Training in Payments for Ecosystem Services**

## **Part III : case studies**

**Bucharest 4-6 November 2013**

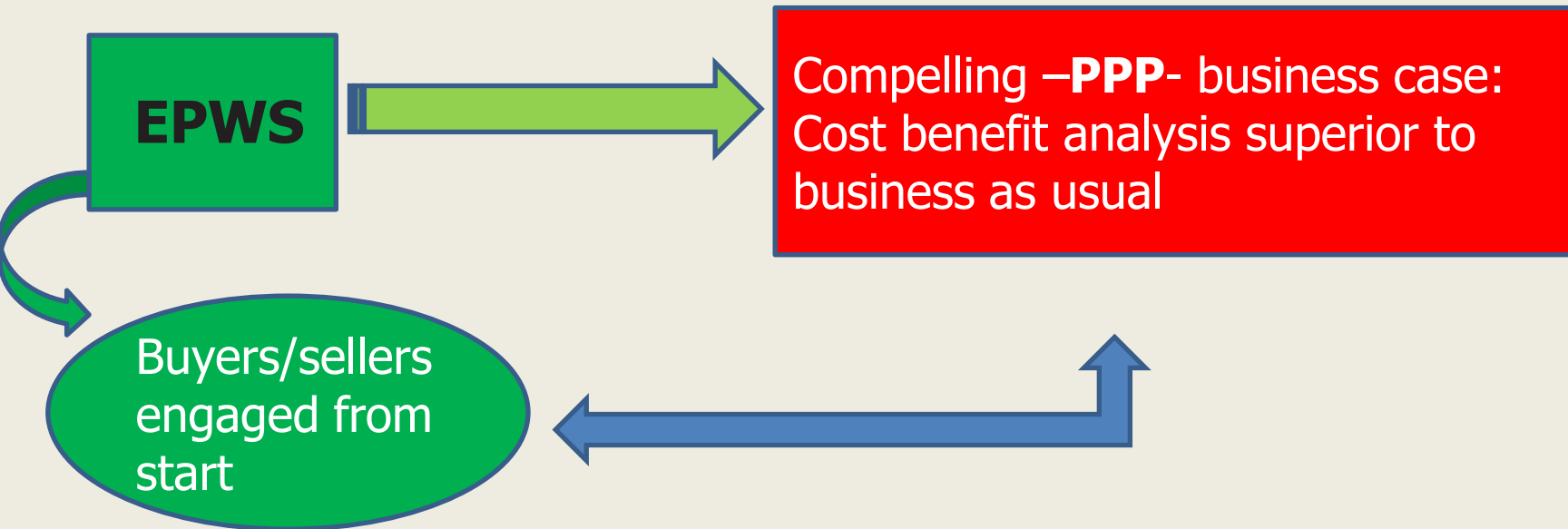
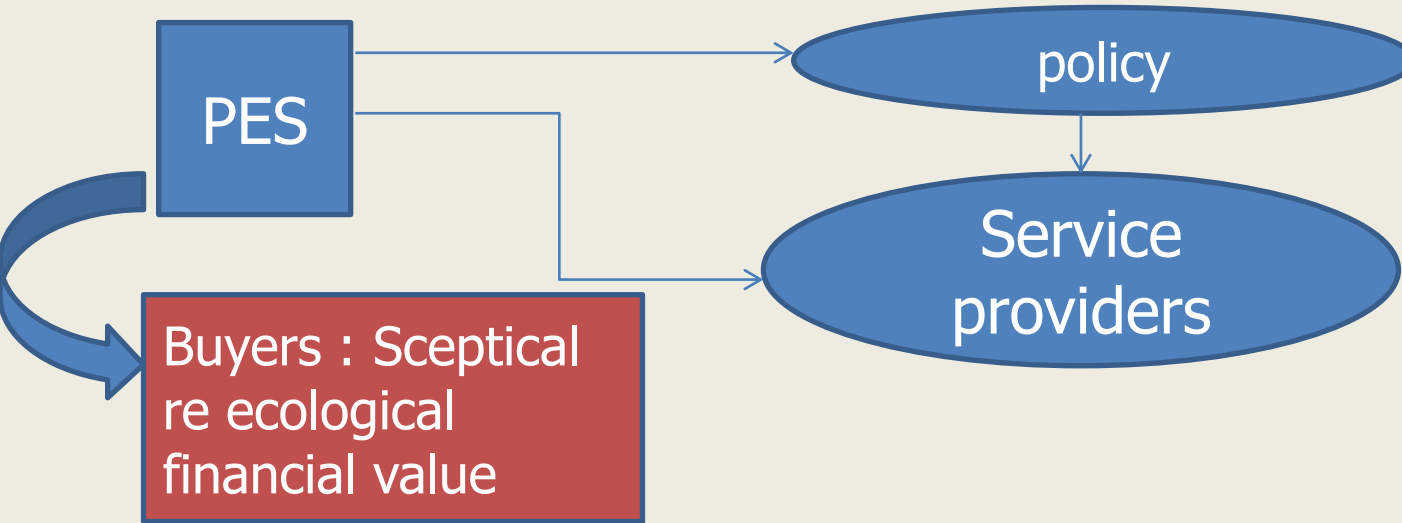
**Julio C. Tresierra  
Ph.d.**

# Water crisis

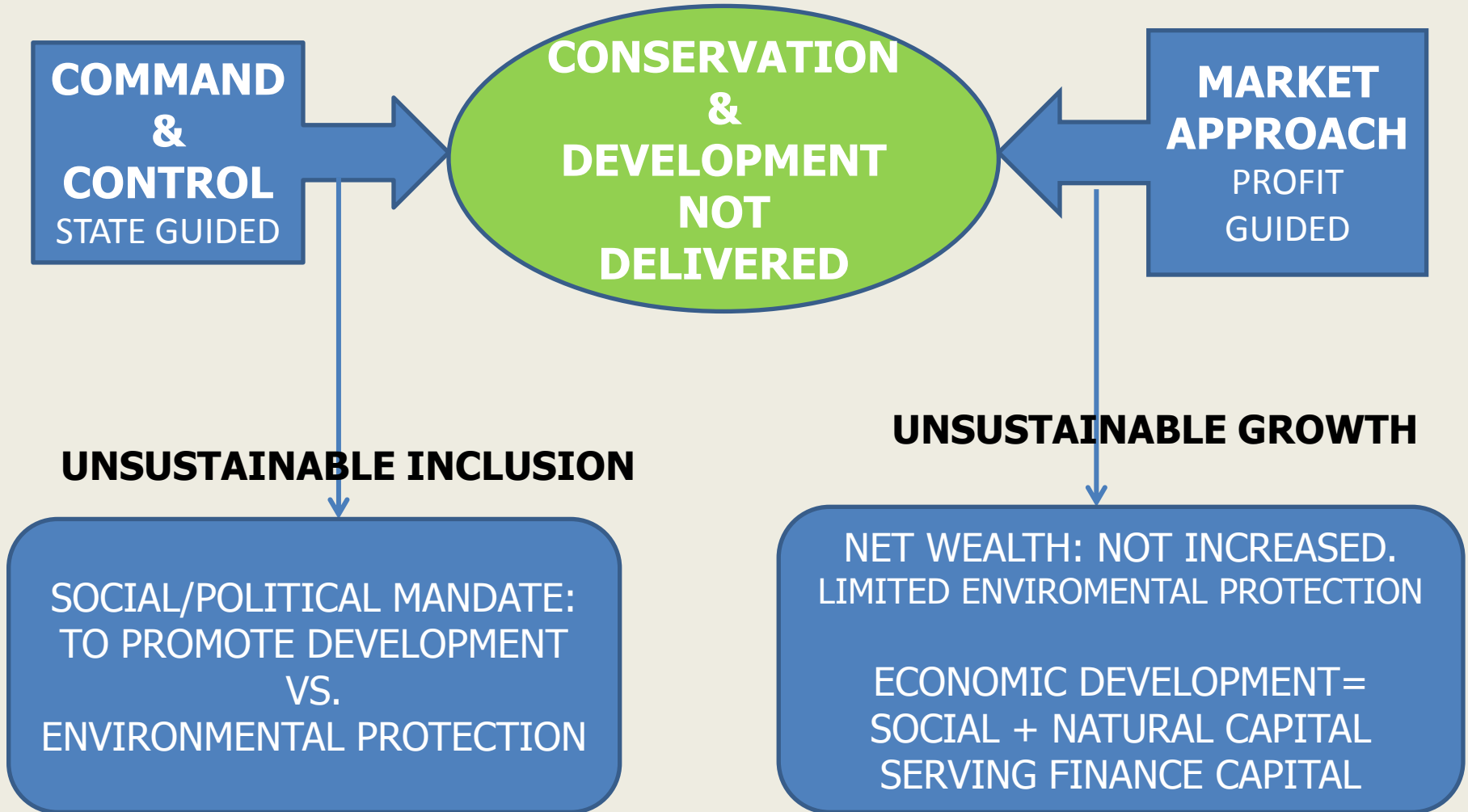
- 1/6 world's population: no access to fresh water
- Problem: uneven distribution and unsustainable management
- Roots of the crisis: poverty, and unequal power relationships



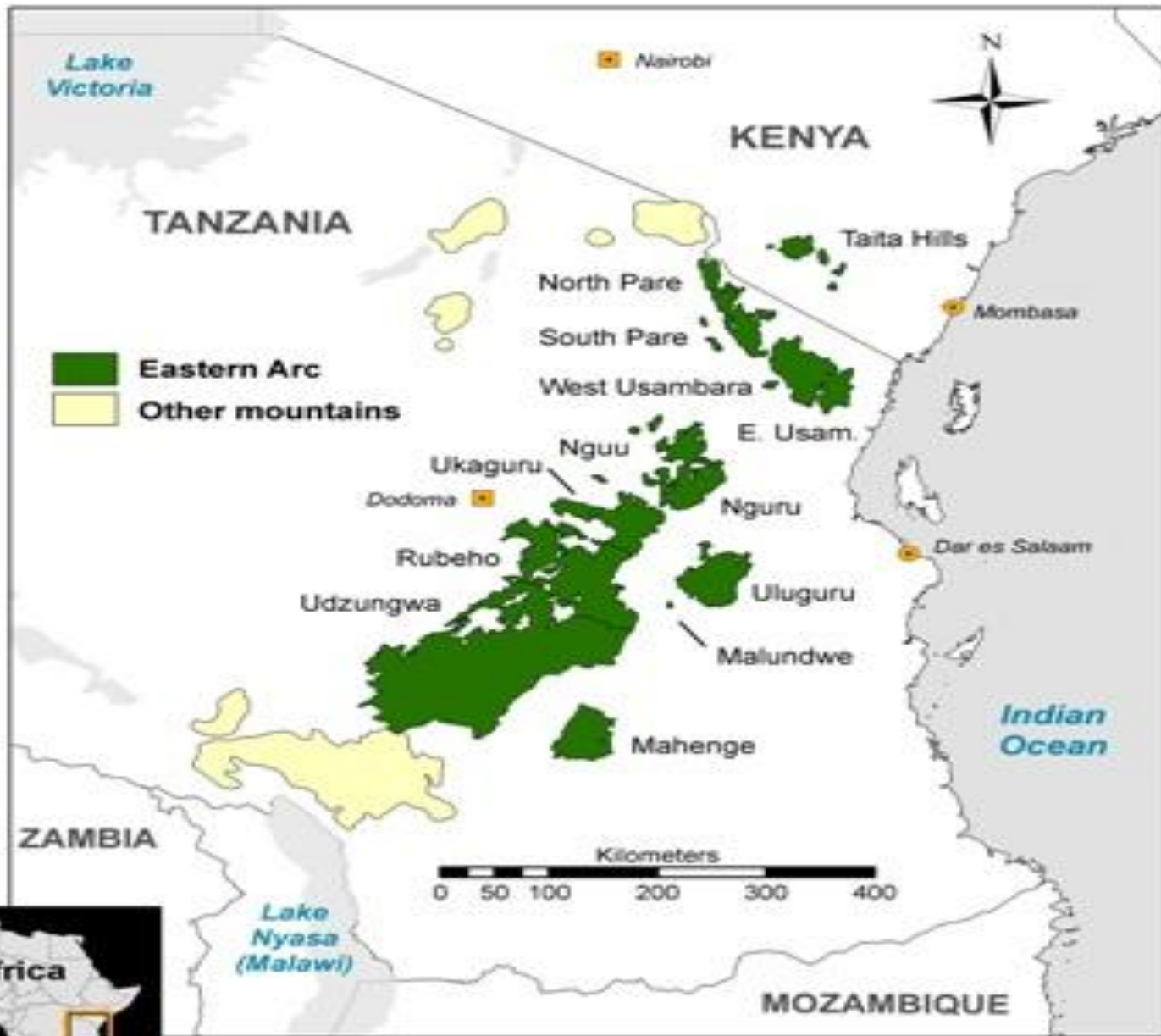
# EPWS: AN (*EQUITABLE*) BUSINESS CASE



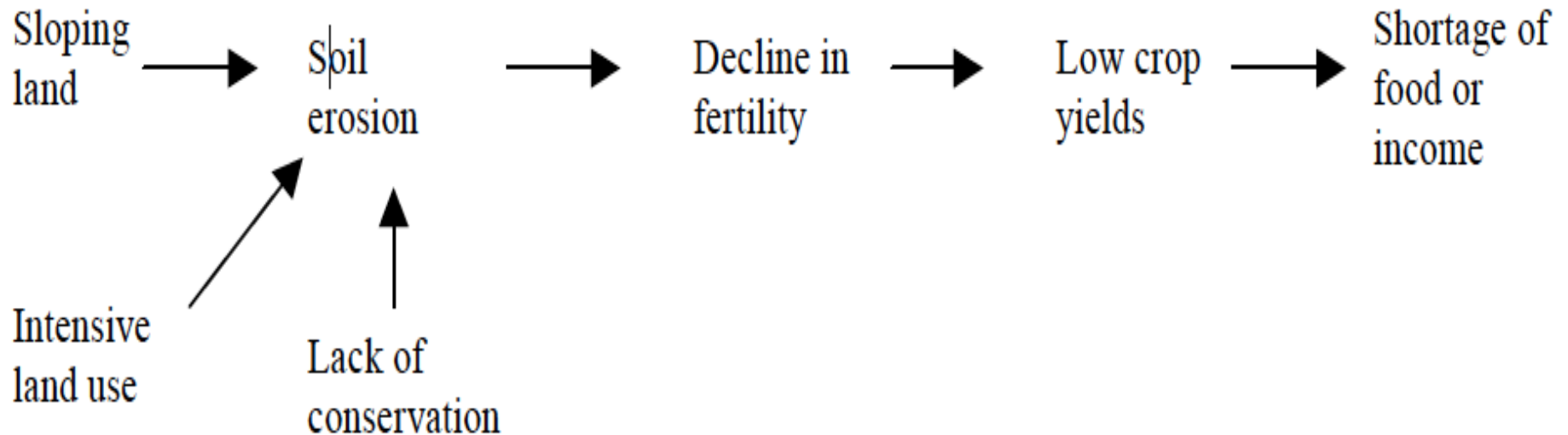
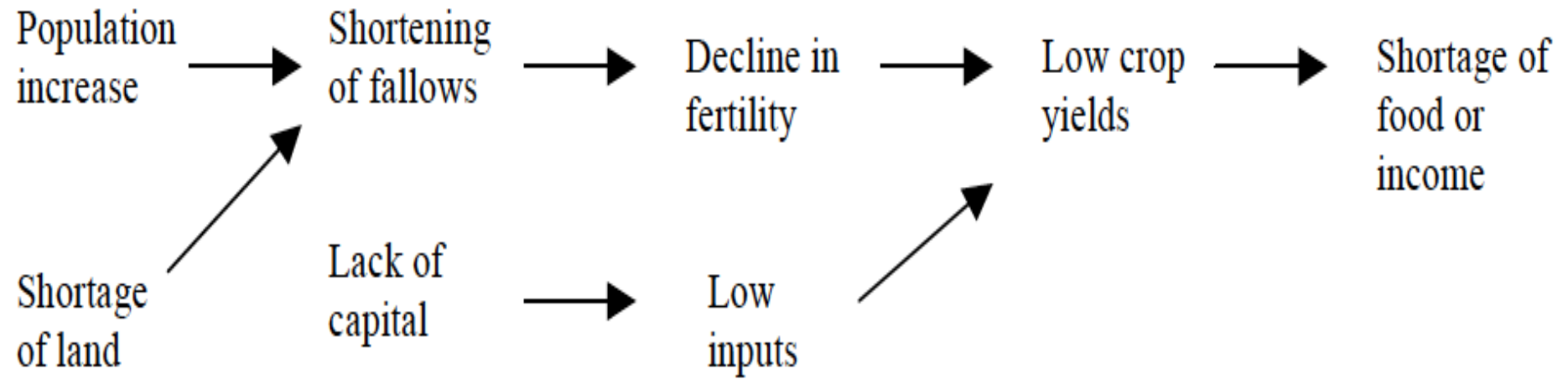
# MARKET AND COMMAND AND CONTROL APPROACH TO CONSERVATION



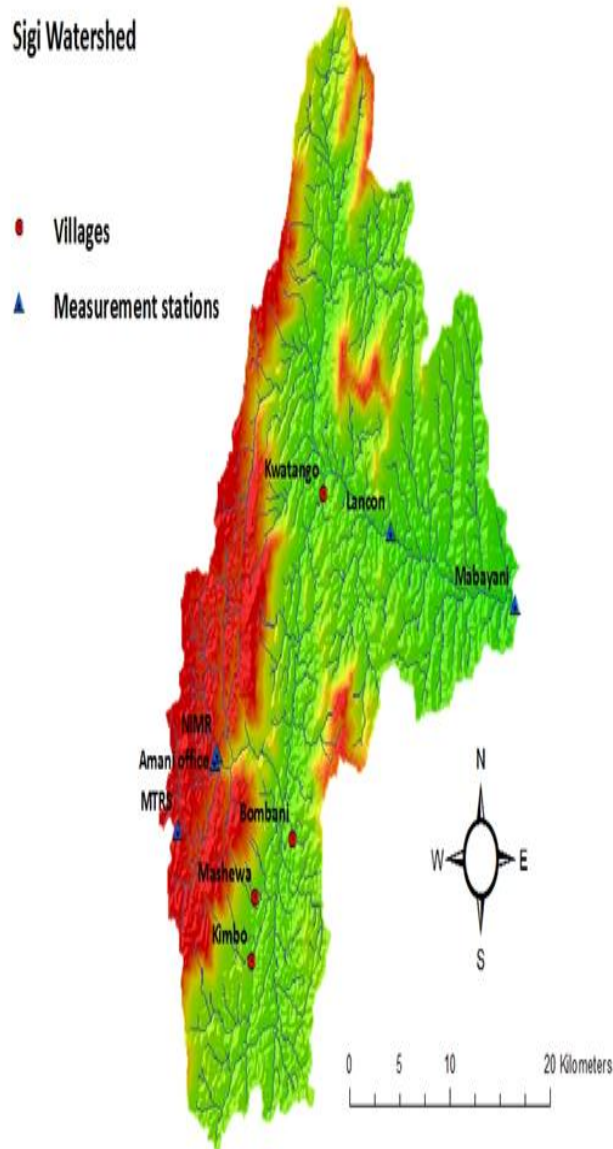
## Site location: East Usambaras







Sigi Watershed



## ZIGI WATERSHED AND "HOT-SPOTS"

The East Usambara Mountains are the source of Zigi River, which have 4 tributaries: Nanguruwe, Dondwe, Kwekuyu and Kihuhwi. The size of the Zigi River basin is estimated at 1,050km<sup>2</sup> (PBWO, 2008). The River (about 65 km long) is the principal source of water for the City of Tanga (population over 250,00). The hydrology study identified three "hot spot" areas along the Kihuhwi River sub catchment which contribute disproportionately to the water problems as it experiences more sediment loading as compared to the rest of the sub catchments. Along this sub watershed the selected communities included in the pilot test are: Kimbo, Shembekeza, Kwaisaka, Mashewa, and Bombani.

# Equitable Payments for Watershed Services

- **Public/private** business between sellers and buyers
- **Phased** approach: securing learning and sustainability
- **Participatory**. Local stakeholders: integral part of decision-making
- **Government** participation
- **Co-financing** since Phase I
- Intensive **monitoring**





# Problem Statement upstream..



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Good land cover at Upper Sigi Sub catchment  
(from [www.amaninature.org/about1.htm](http://www.amaninature.org/about1.htm))



Farming on hilly slopes at Middle Sigi  
sub catchment (photo by Mahay)



Good land cover Muzi Sub catchment  
(see the background) (photo by Mahay)



Cleared forest at Lunguza in Kihuhwi sub  
catchment (photo by Mahay)

# Problem Statement...downstream



Aquatic weeds at Mamba hotel along the shores of the reservoir (photo by Mahay)



Water hyacinths covering Sigi River at Miaseni village (photo by Mahav)

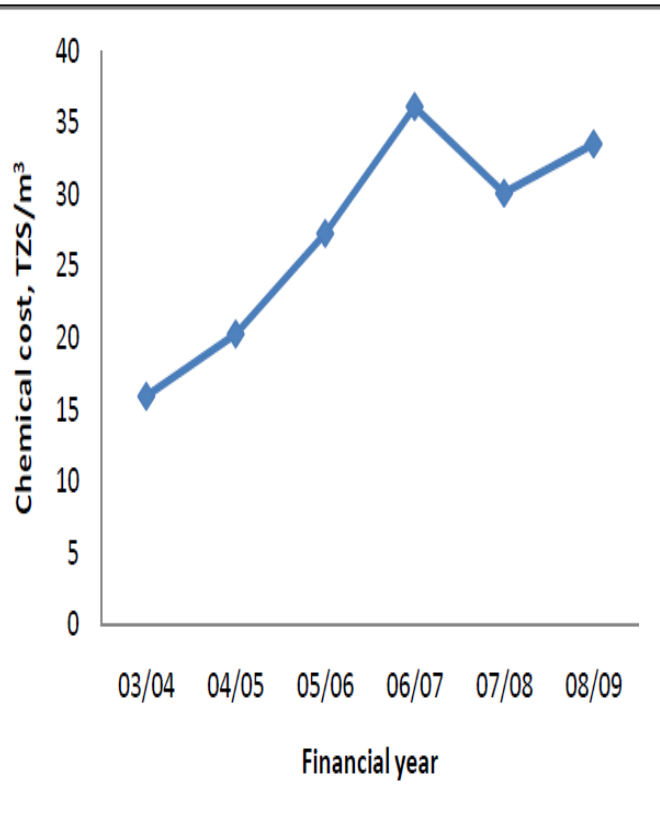
Mabayani Reservoir	Status just after filling the reservoir (1978)	Status in 2010
Average Depth (m)	8.7	5.4
<u><a href="#">Storage volume (million m3)</a></u>	8	5.9



WWF

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## COST BENEFIT ANALYSIS



Sedimentation problem is on increase.

The depth of the Mabayani reservoir reduced by 38%.

The reservoir storage capacity has been reduced by 25%

The turbidity is visibly increasing in the catchment, thereby decreasing overall water quality

Rising costs in treating and processing water at the Mowe Treatment Plant Between 2009 – 2011 water treatment costs per annum were escalating/in the tune TZS 400m (US\$ 258.000)

Tanga UWASA is compelled to regularly seek approval from the Energy & Water Utilities Regulatory Authority (EWURA) for tariff increase.

Business as usual will make matters worse

## **BUYERS AND SELLERS**

**Buyers:** Are the recipients of hydrological services.

**TANGA UWASA** Additional Buyers might be included as the programme progresses. The Buyer's financial commitments:

Current fiscal year: 12.500 USD

Fiscal year 14-15 : 25.000 USD

Fiscal year 15-16: 70.000 USD

Fiscal year 16-17: 85.000 USD

**Seller:** Executors of land use changes to facilitate delivery of hydrological services. Kimbo, Shembekeza, Kwaisaka, Mashewa, and Bombani villages organized into a Conservation farmers Union "**UWAMAKIZI**". The Number of sellers might be increased according to programme development.

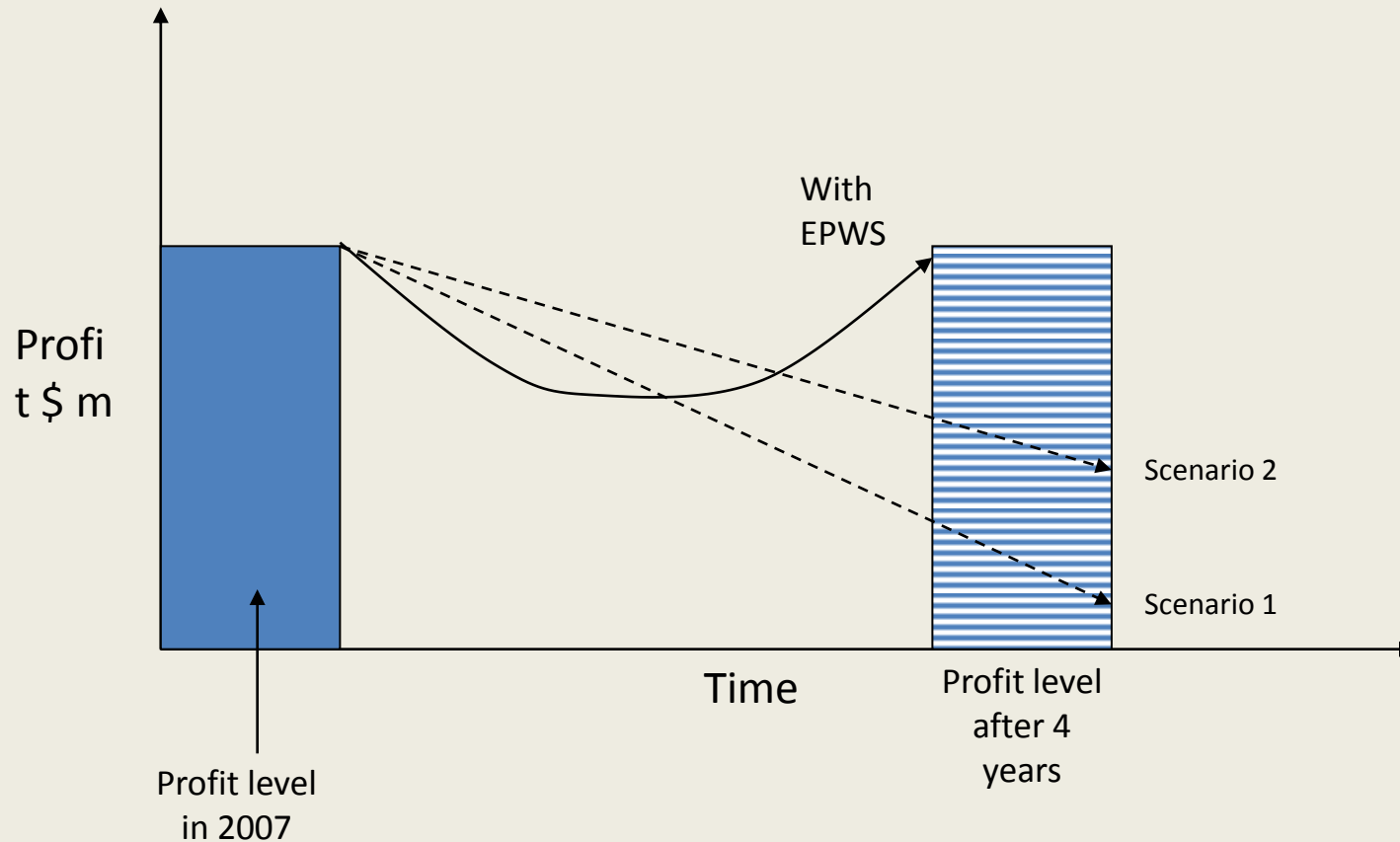
The sellers agree carry out land use changes as recommended by the project baseline studies. These may include, but not be restricted to the following: Terrace farming; Strip-cropping; Agro-forestry; Fanya juu terrace farming; Riparian zone restoration.



# EPWS as a potential Solution: land-use change

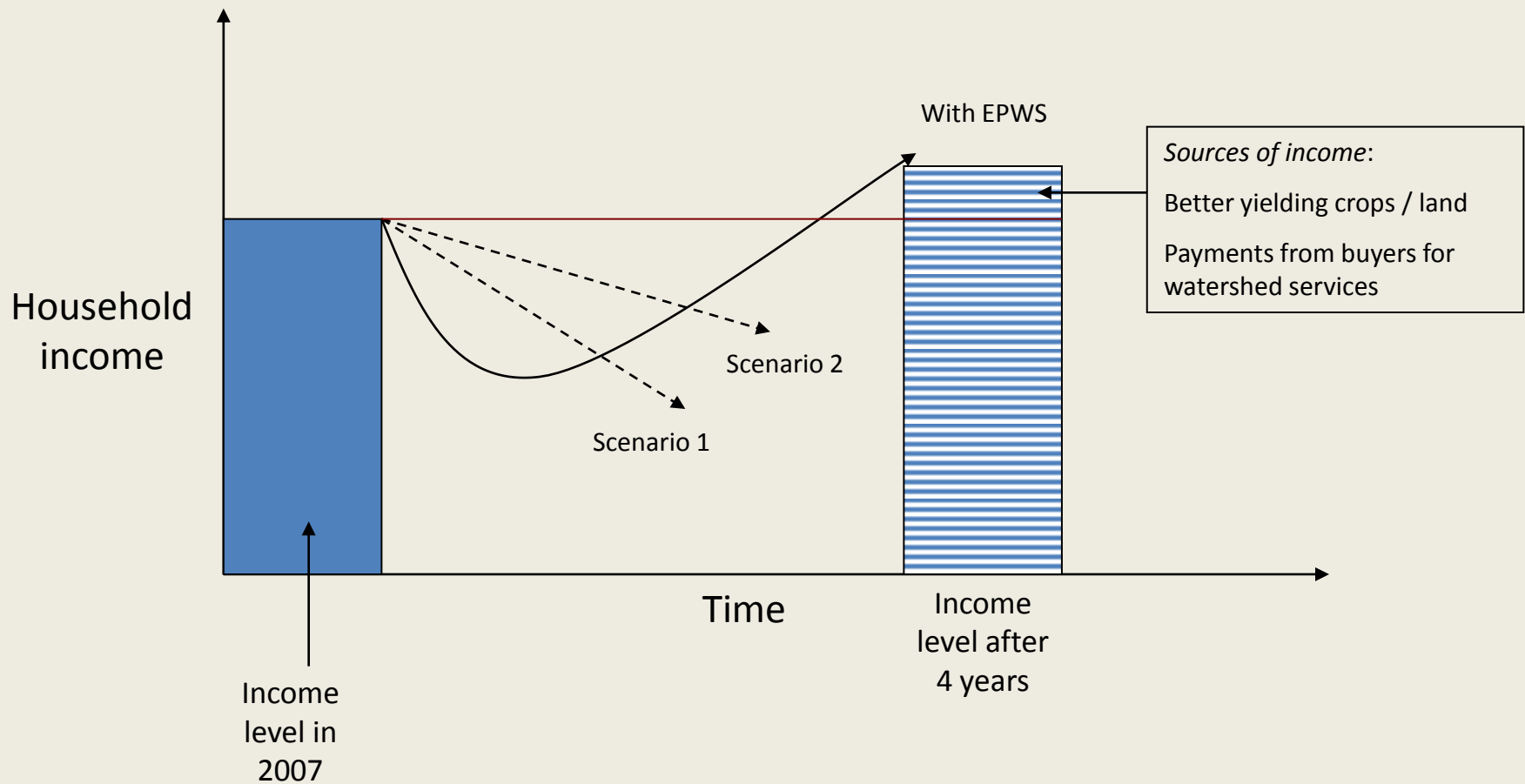
SN.	Proposed Interventions	Total Agr. Land size to intervene (acres) in the three hotspot villages	Intervention cost/acre (US\$)	Cost per month (US\$)	Per annum cost (US\$)	Total Cost in four years (US\$)
1	Bench Terrace	509	92	975	11,697	46,787
2	Fanya Juu/Fanya Chini	934	66	1,289	15,463	61,851
3	Agroforestry	149	335	1,040	12,481	49,924
4	Fruit Orchards	273	203	1,152	13,829	55,315
5	Grass Strip Farming	549	38	430	5,155	20,620
6	Woodlot establishment	87	158	287	3,440	13,758
7	Riparian Zone Restorations	600	186	2,323	27,873	111,490
	Grand Total	3101 (60%)		7,495	89,937	359,746
	<b>Exchange rate</b> <b>1\$=TZS 1550</b>					

# The buyer's perspective (1)



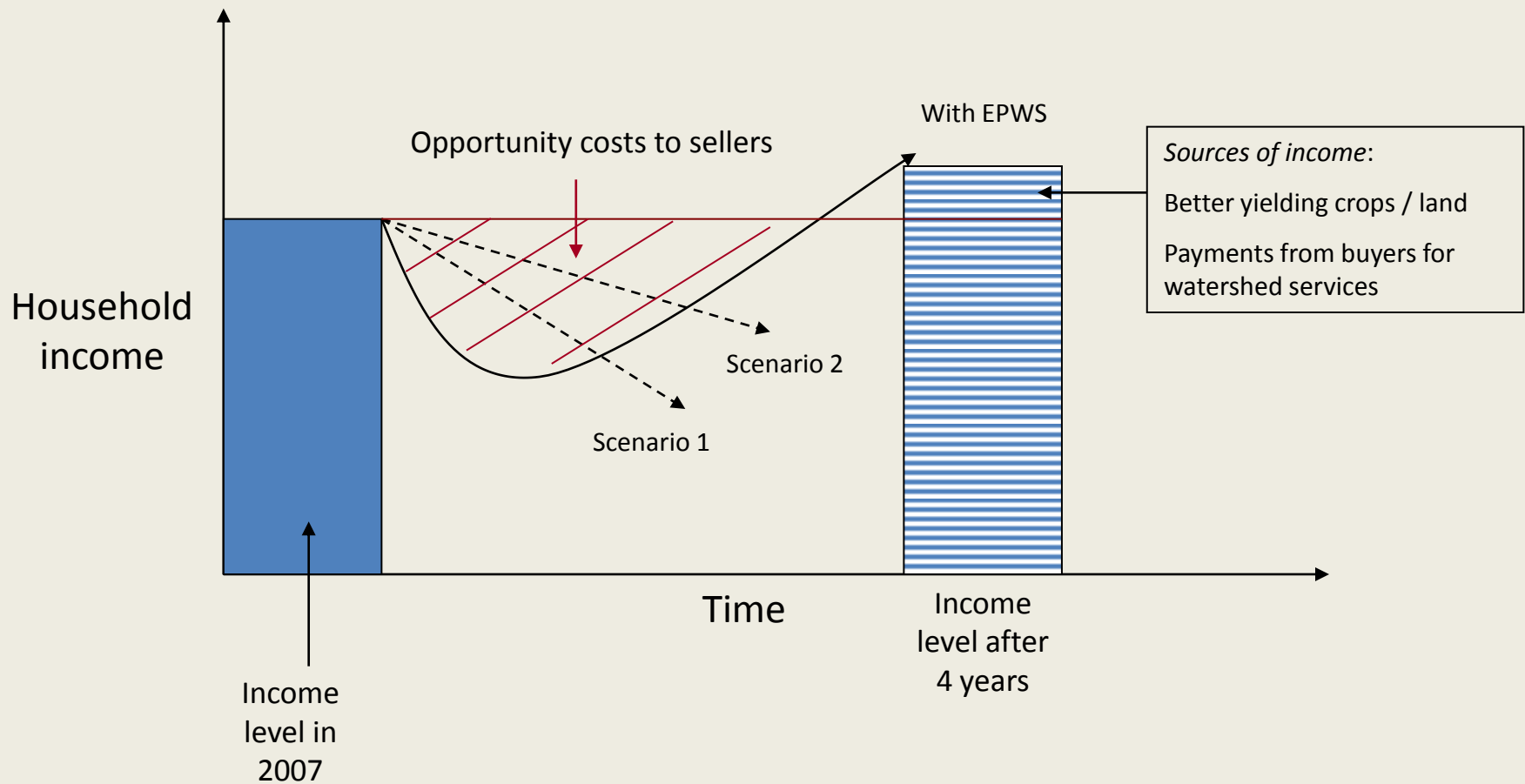
Buyer faces considerable loss of profitability without EPWS as consequence of water problem. EPWS mechanism aims to return buyer to today's level of profitability

# The seller's perspective (1)



Sellers face reduced income as consequence of water problem. EPWS delivers increased by the end of the intervention

# The seller's perspective (2)



The opportunity costs funded by the programme enable sellers to gain access to superior income streams