



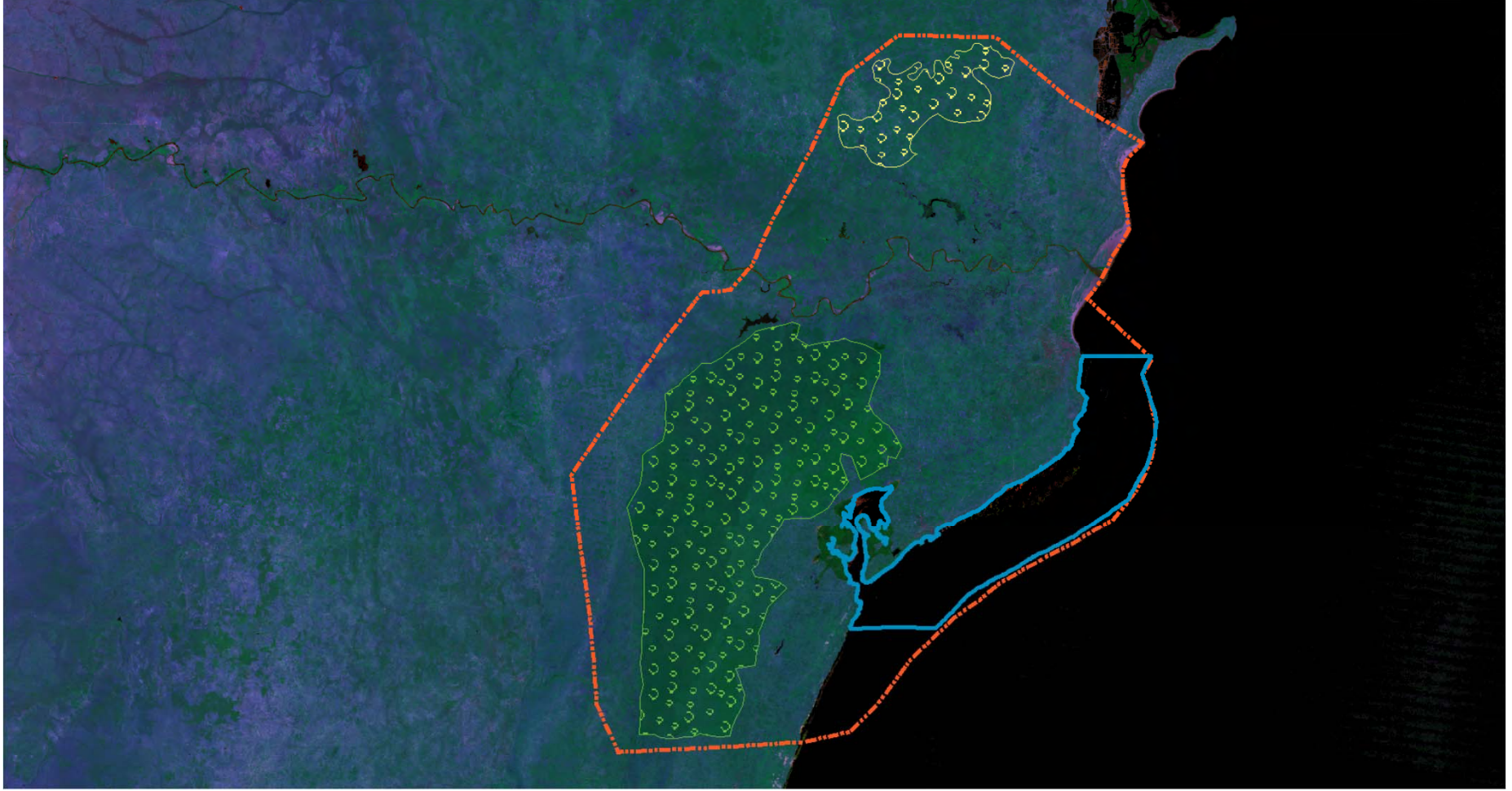
UNESCO MaB Climate Change Adaptation and Mitigation in Biosphere Reserves

A practitioners perspective

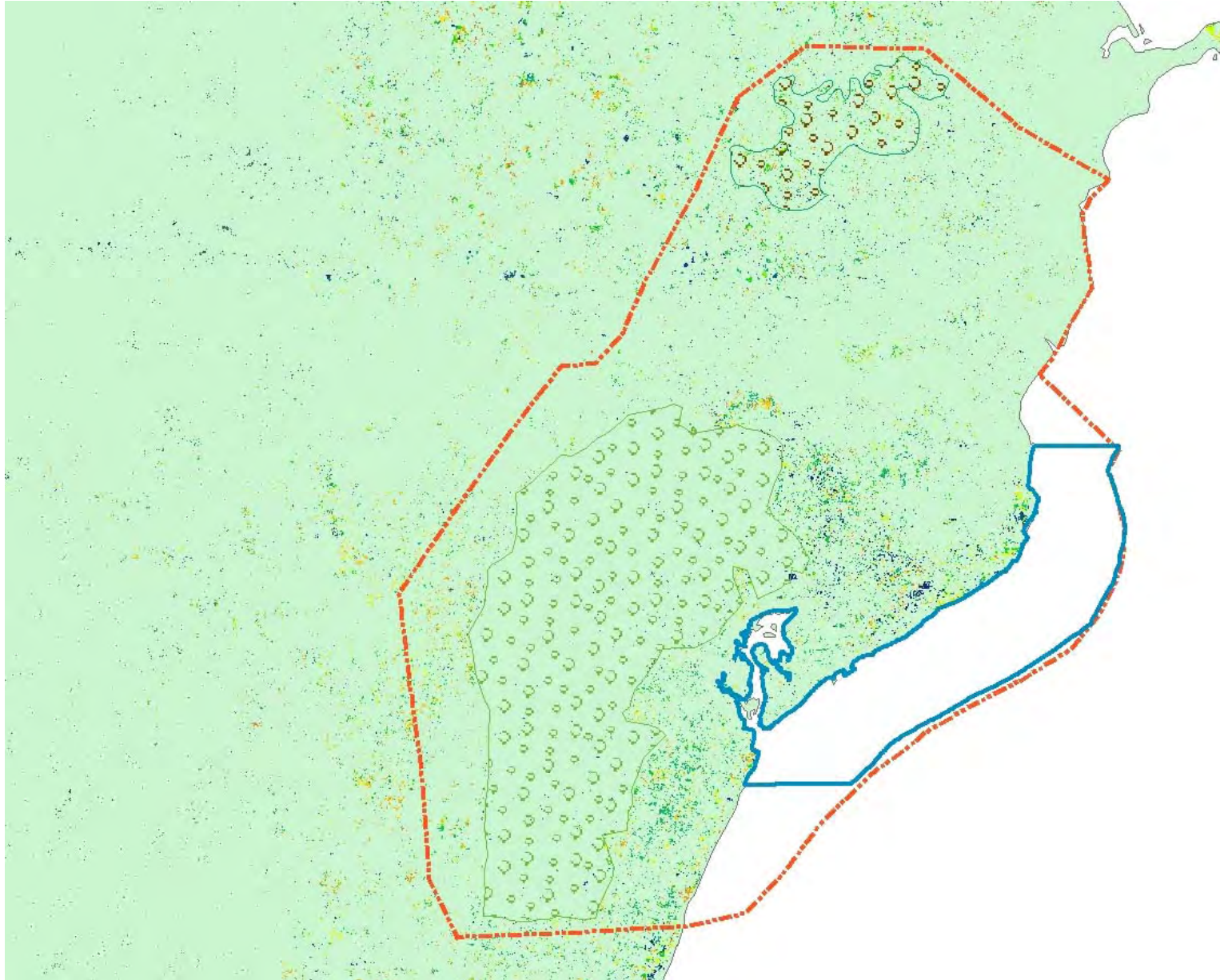
Andrew Bell

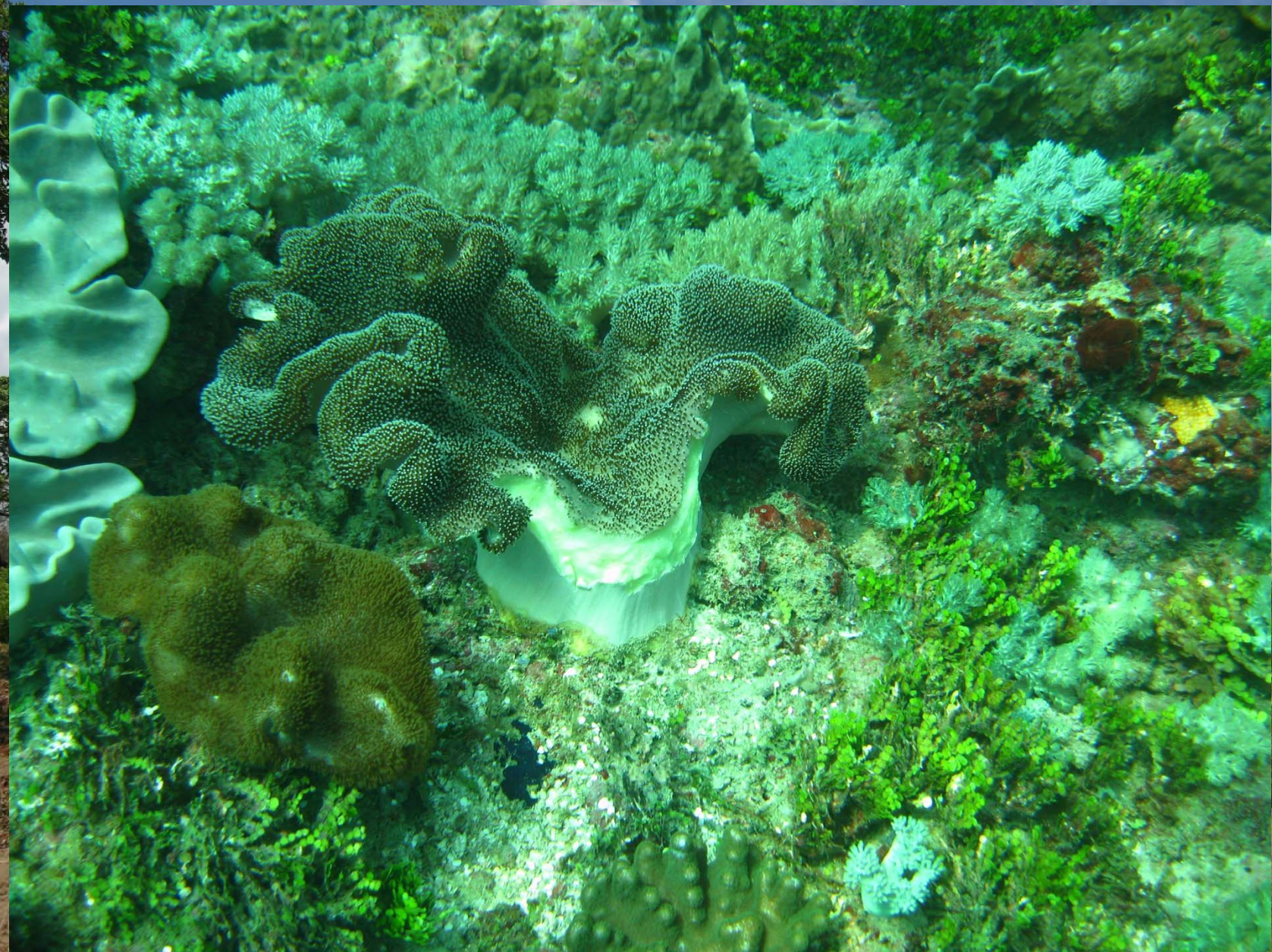
Overview

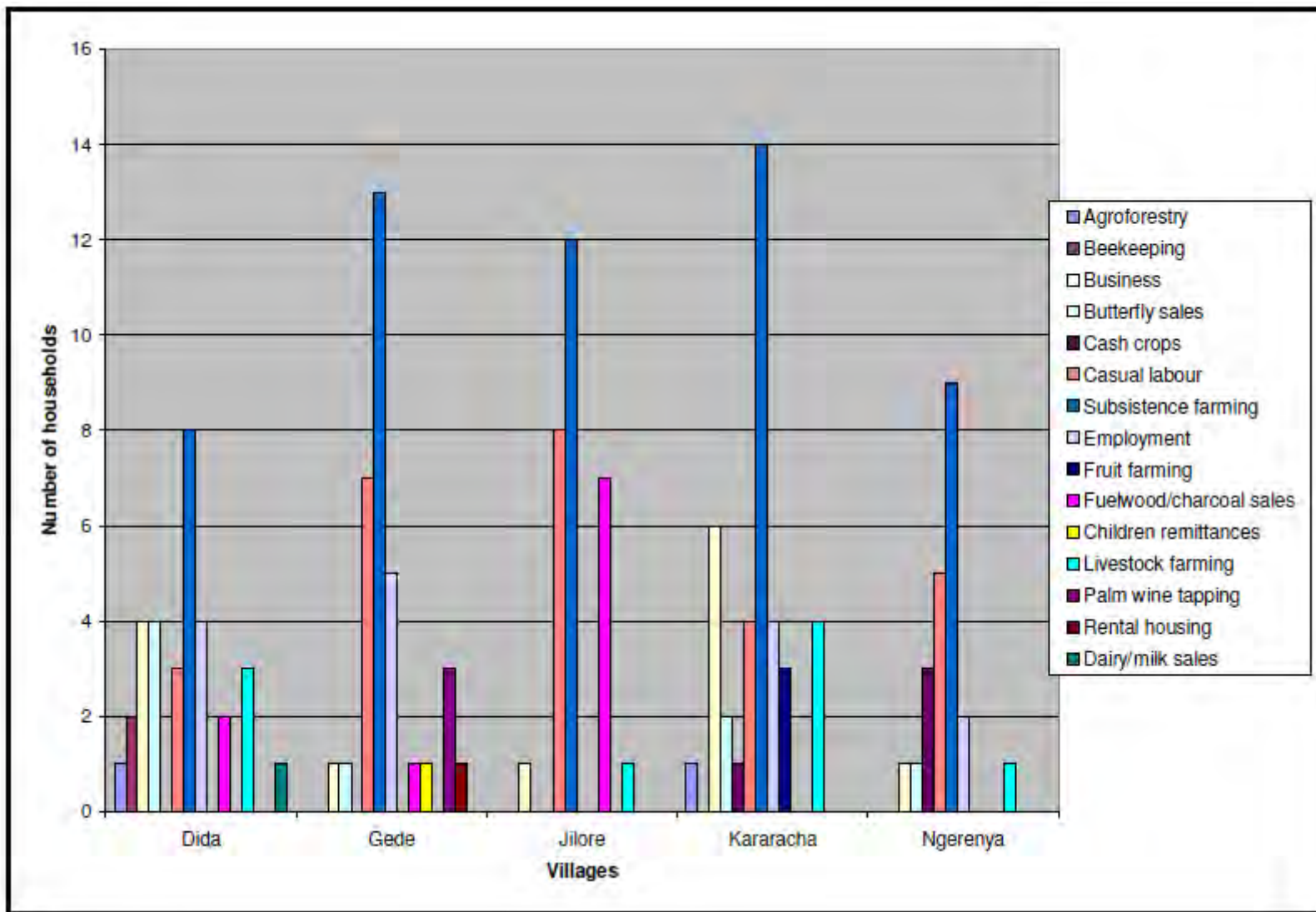
- Examples of 3 sites
 - Malindi Watamu, Kenya
 - East Usamabara, Tanzania
 - Cu Lao Cham Hoi An, Vietnam
- Recommendations



Forest loss 2000-2015 (Hansen)



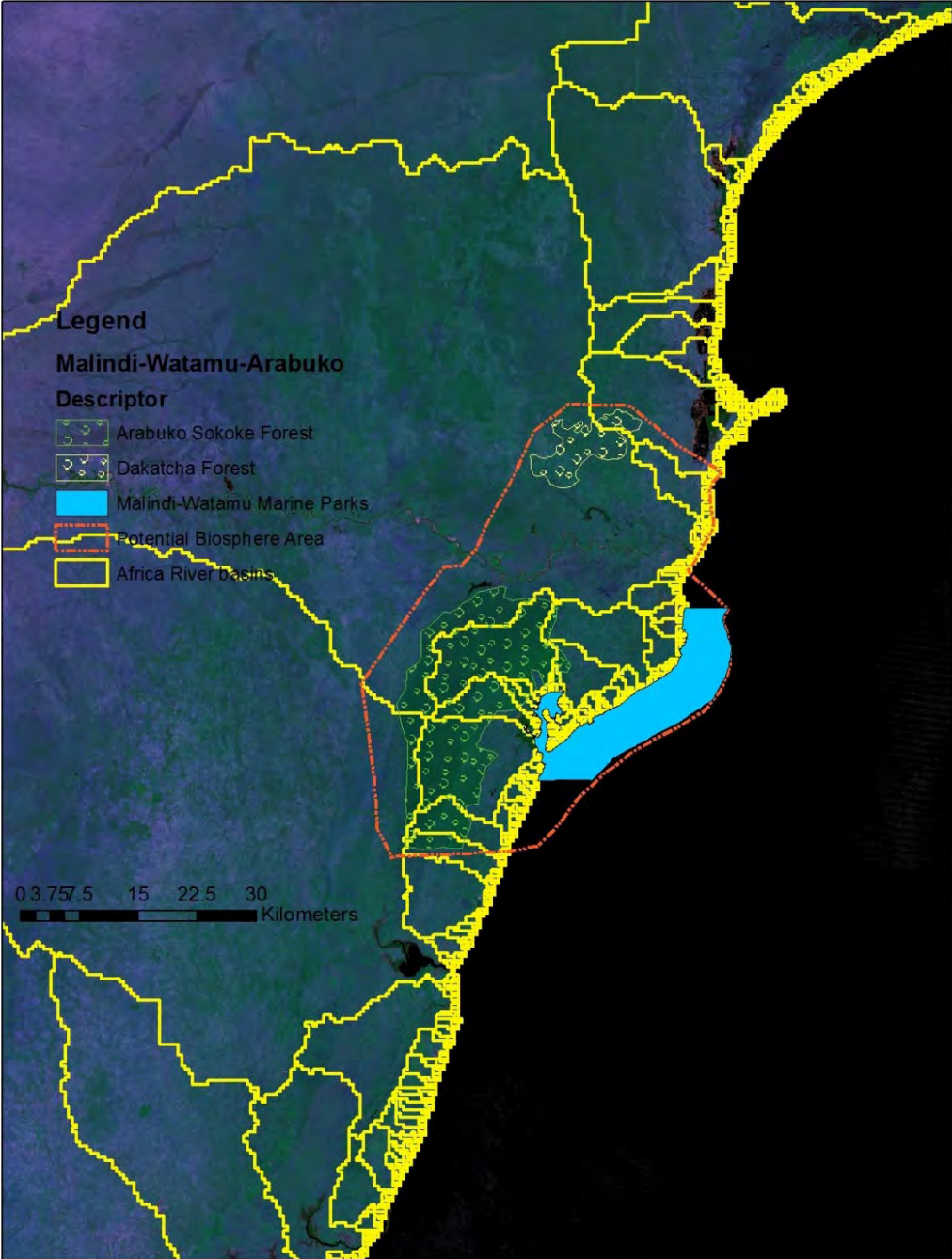




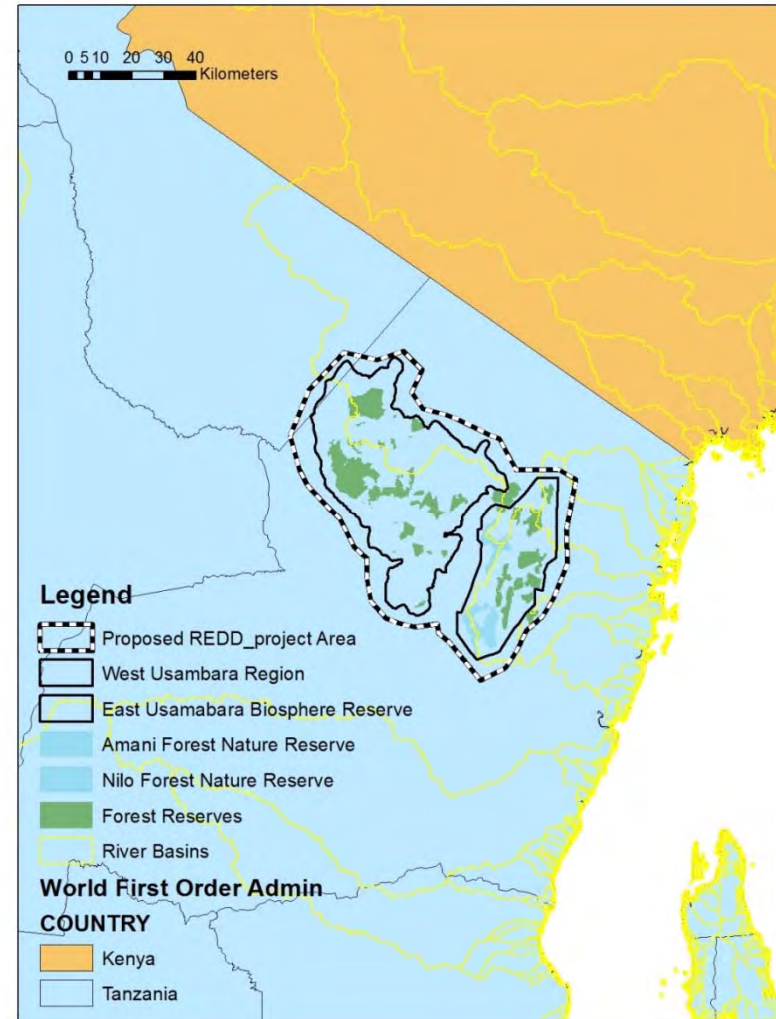
Mbuvi et al 2007

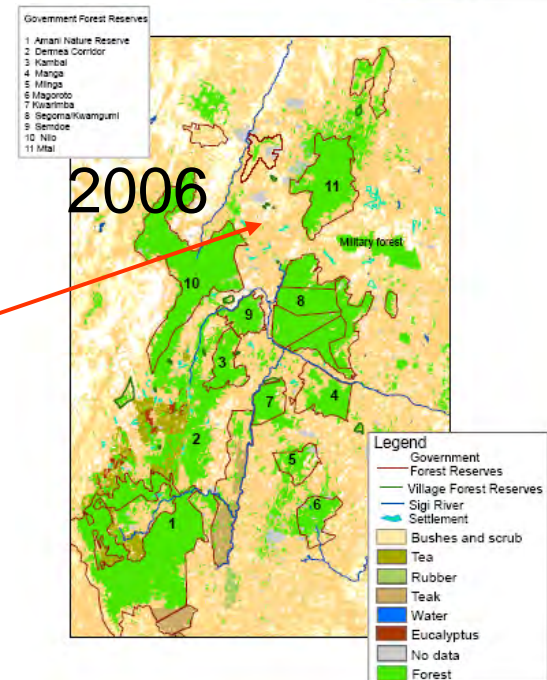
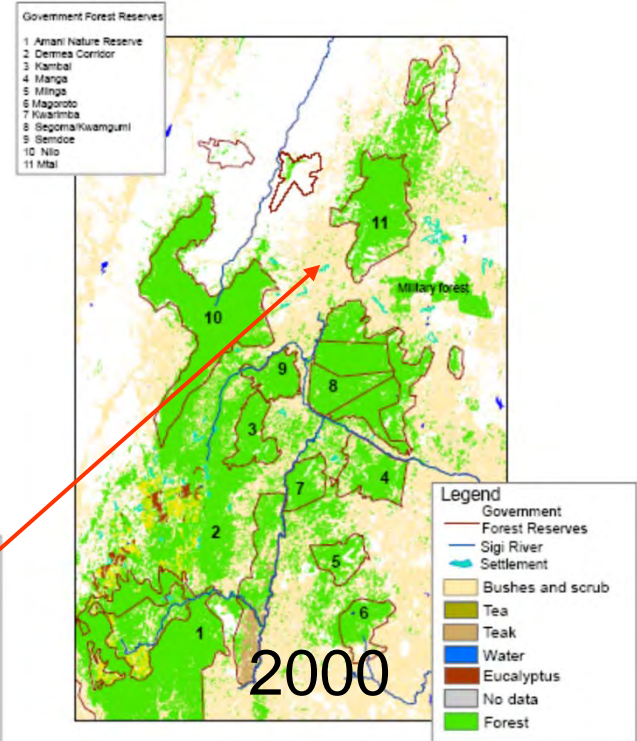
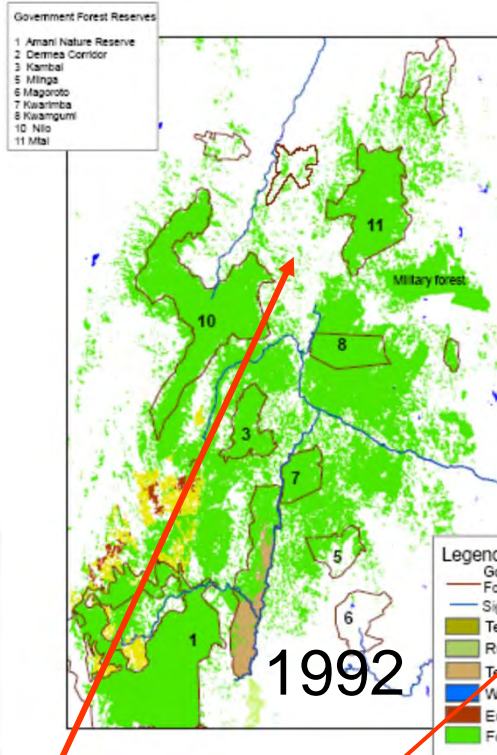
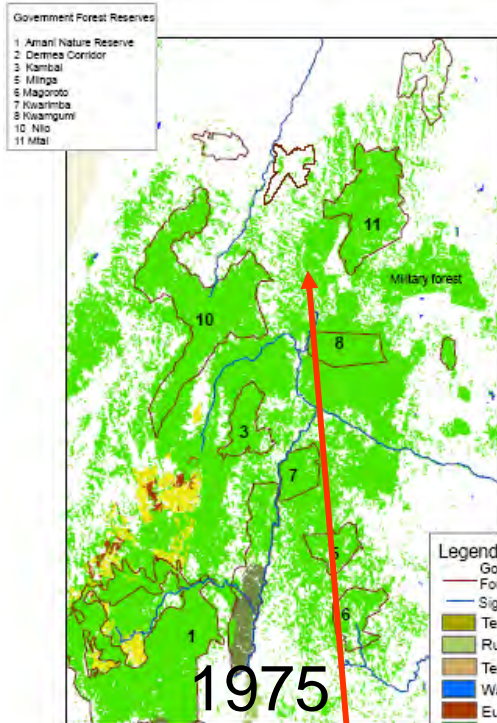
Social impacts/Issues

- Poverty
- Pressure from agri-business
- Jatropha cropping
- Over abstraction of water
- Saline intrusion into the groundwater
- Land grabbing
- Decline in tourism due to Al Shabaab

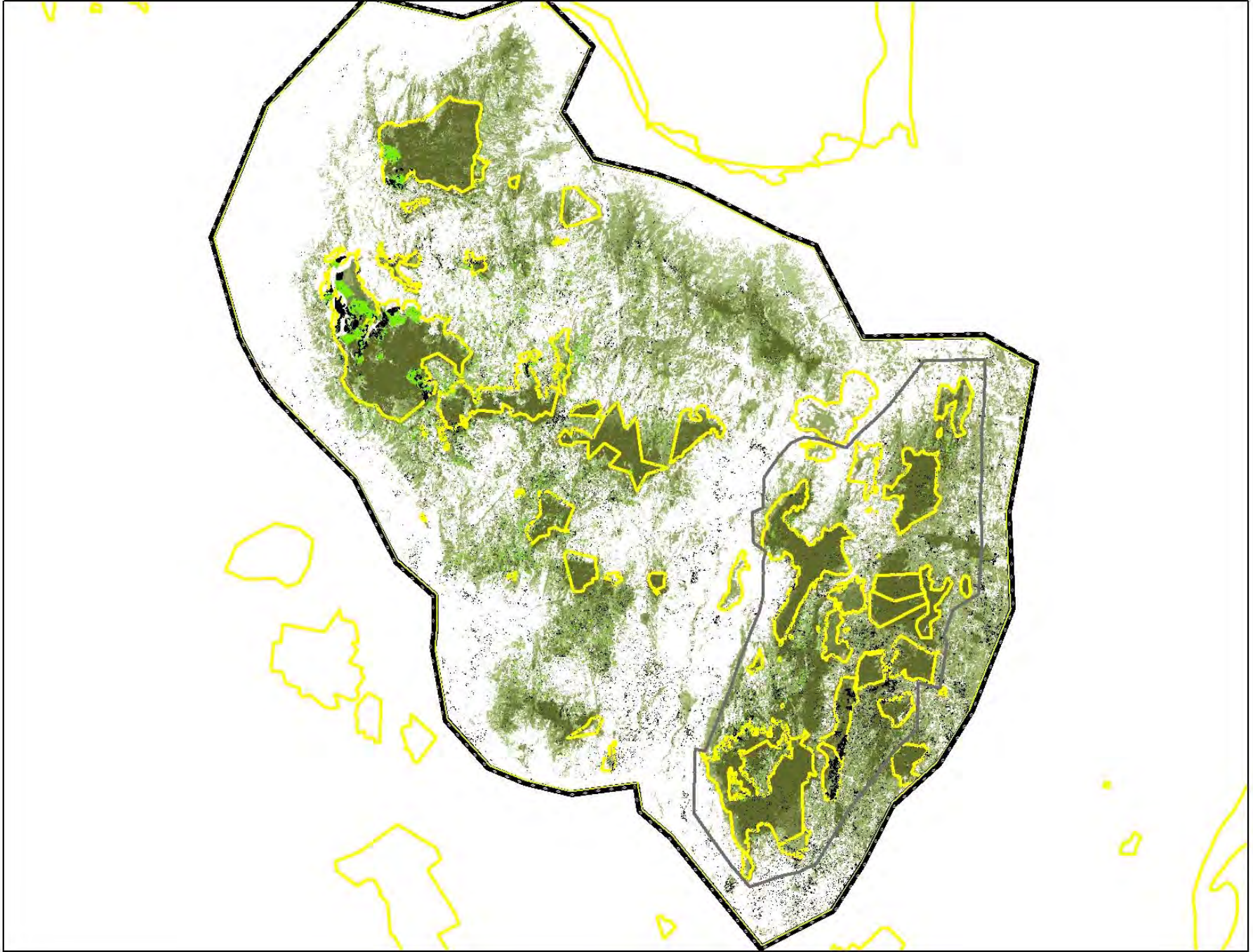


East Usambara, Tanzania





Forest cover change in East Usambara between 1975-2006 ca 16,680 ha lost!



Community forest reserves

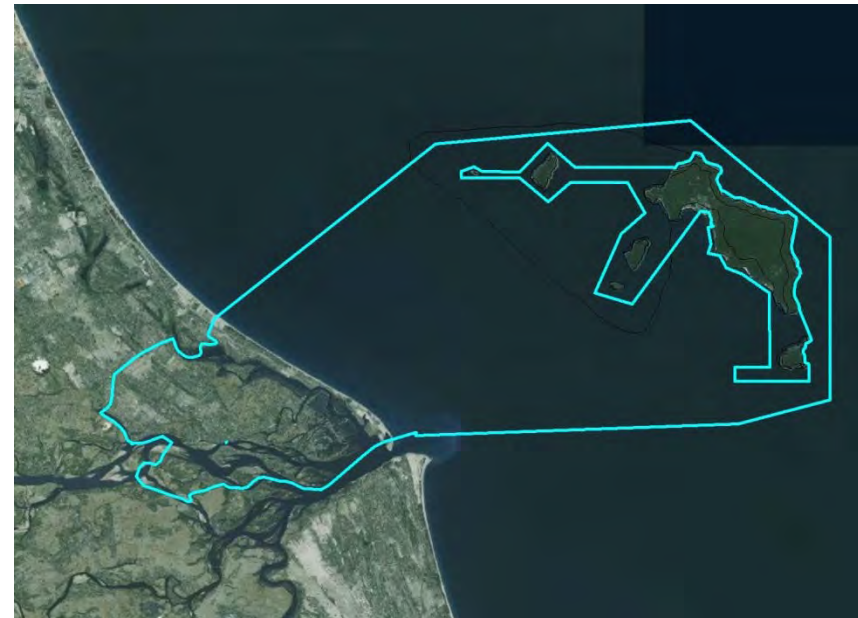
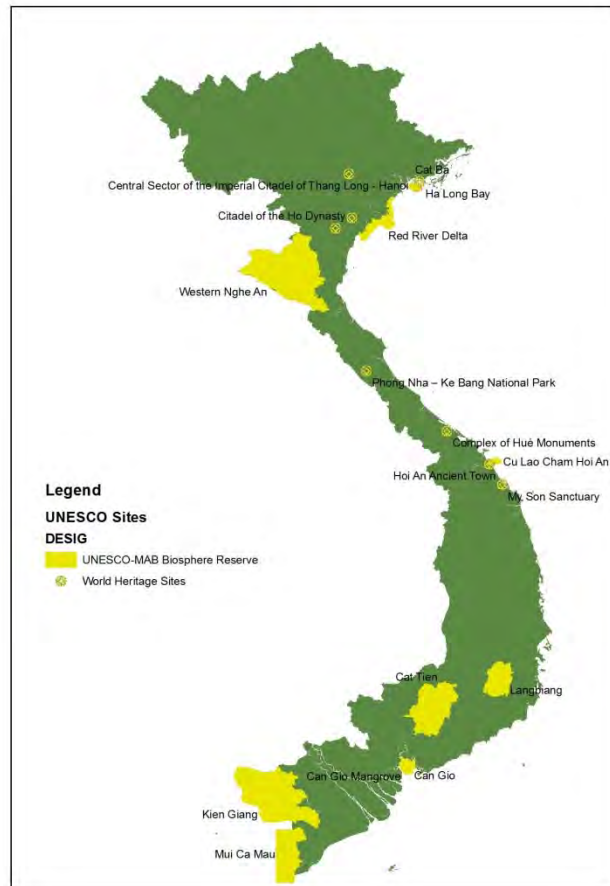
Agroforestry and bio-intensive gardens



Options in Usambara Mnts

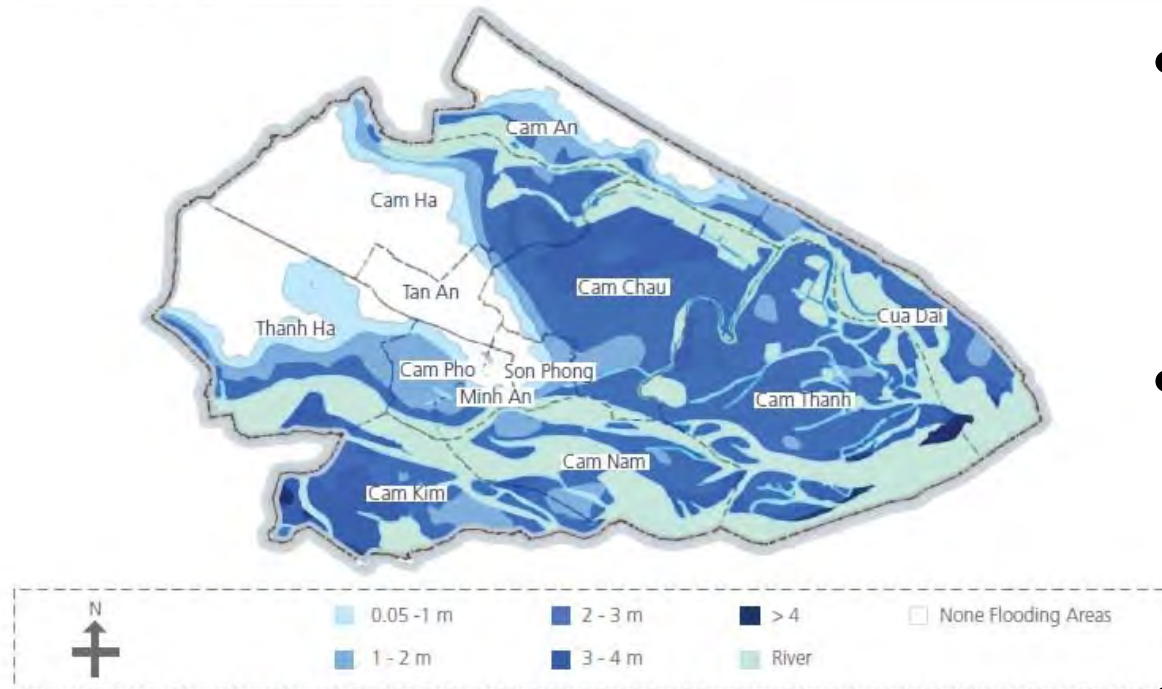
- Extended rotation in teak forests
- Improved agro forestry on village lands
- Improved management of tea estates and wood fuel
- Consider gains outside of the areas for critical mass

Cu Lao Cham-Hoi An, Vietnam



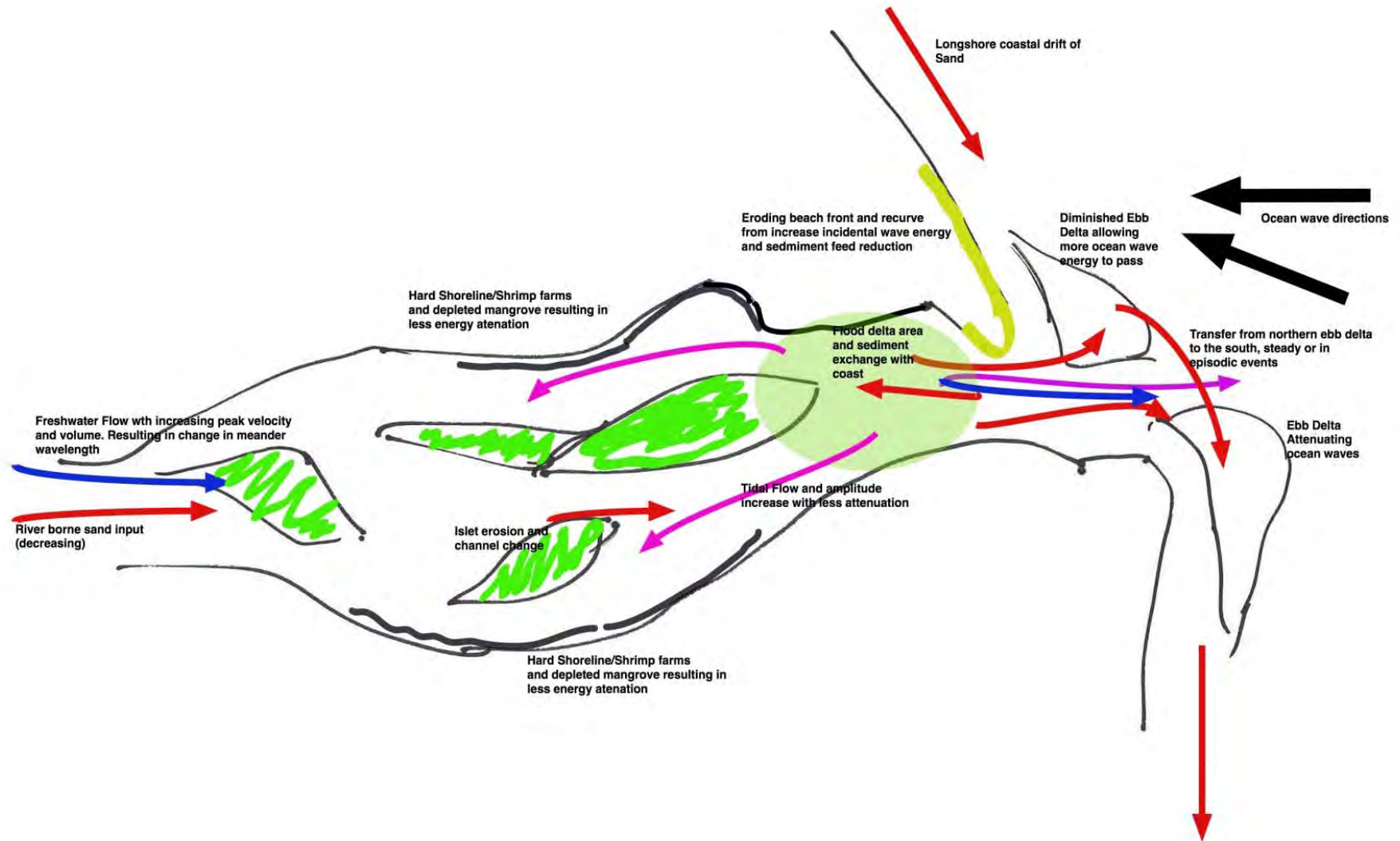
Hoi An City

Figure 7: Areas likely to be inundated by floods in 2020

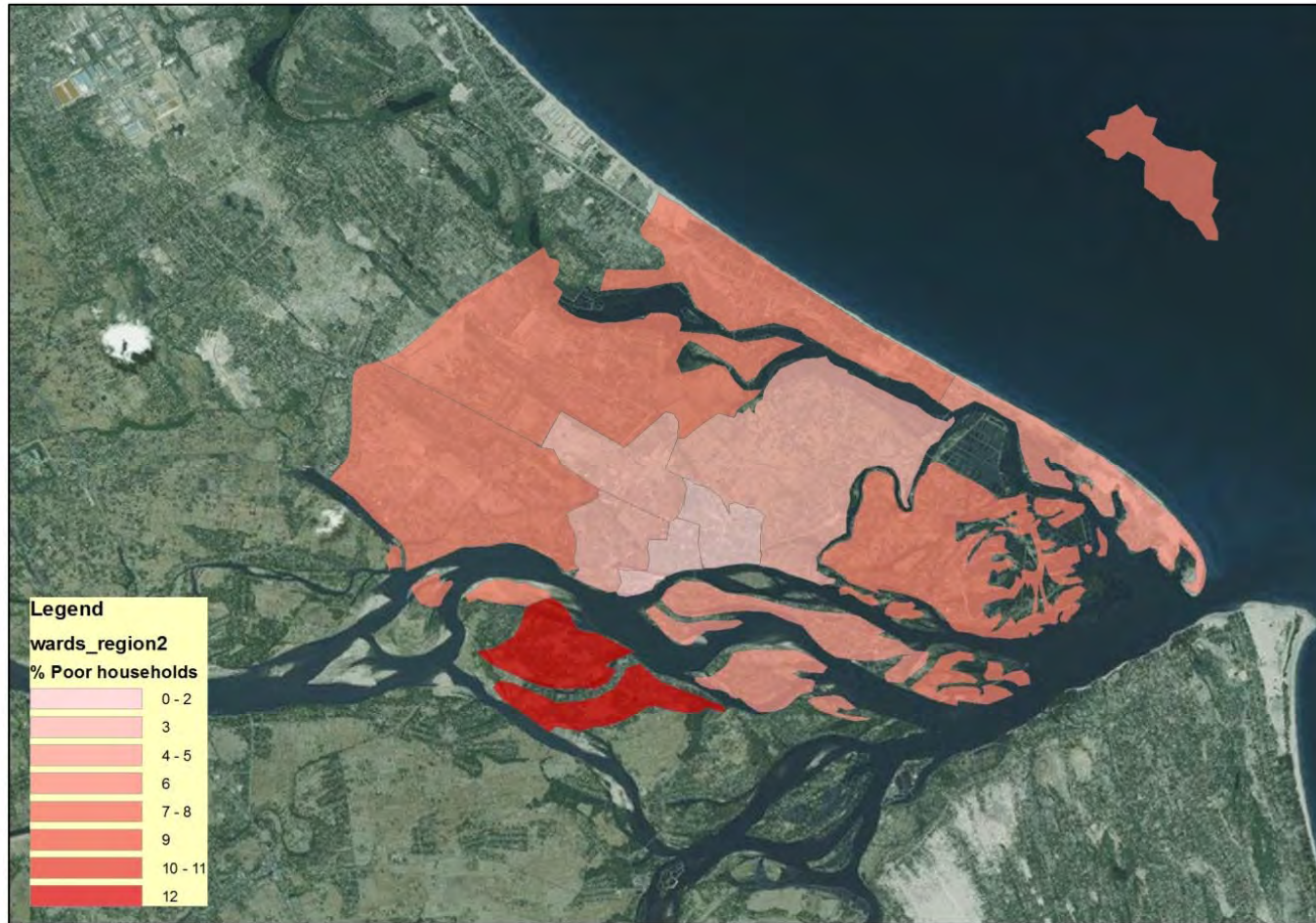


- Flooding from catchment and estuary.
 - Coastal Process work
- Opportunities for waste, anaerobic digestion and biochar/fertilisation
- Solar energy

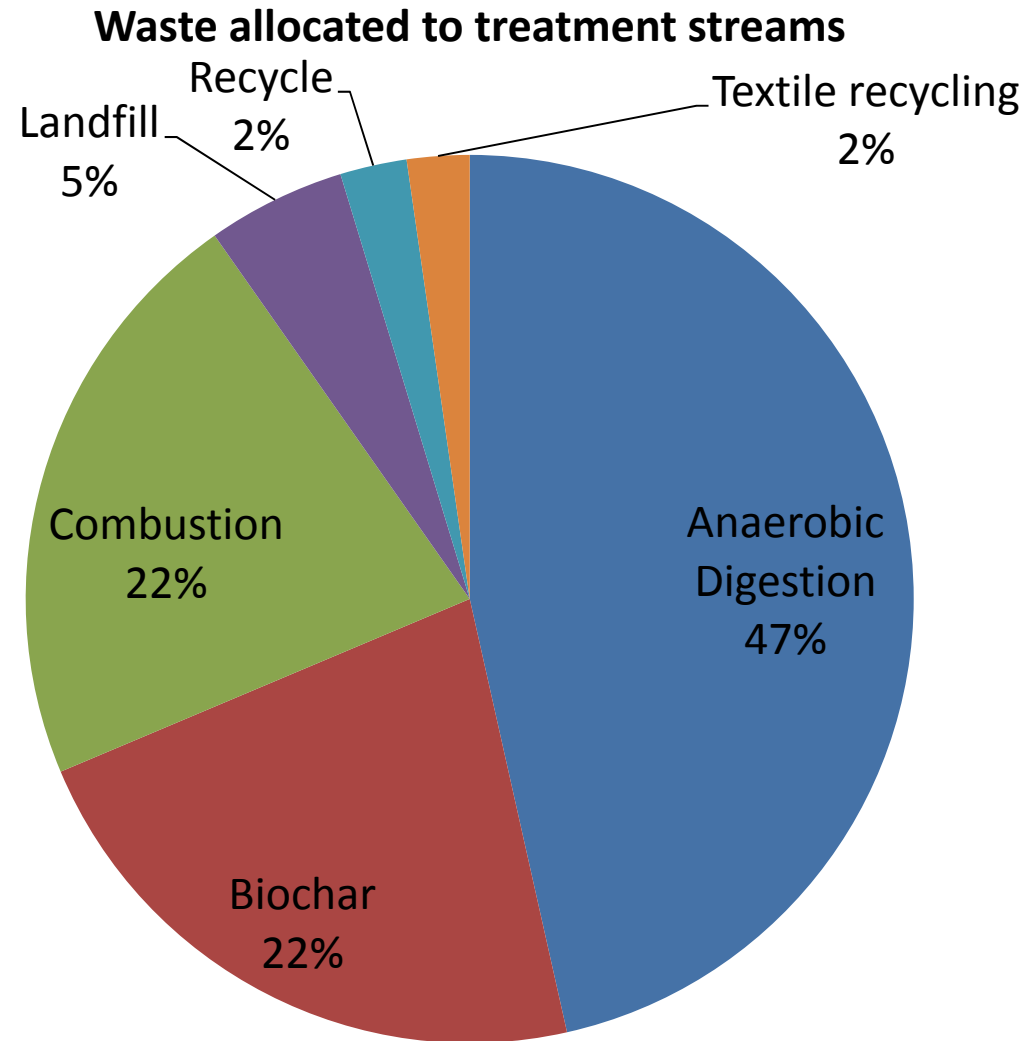
Conceptual coastal/estuarine process model



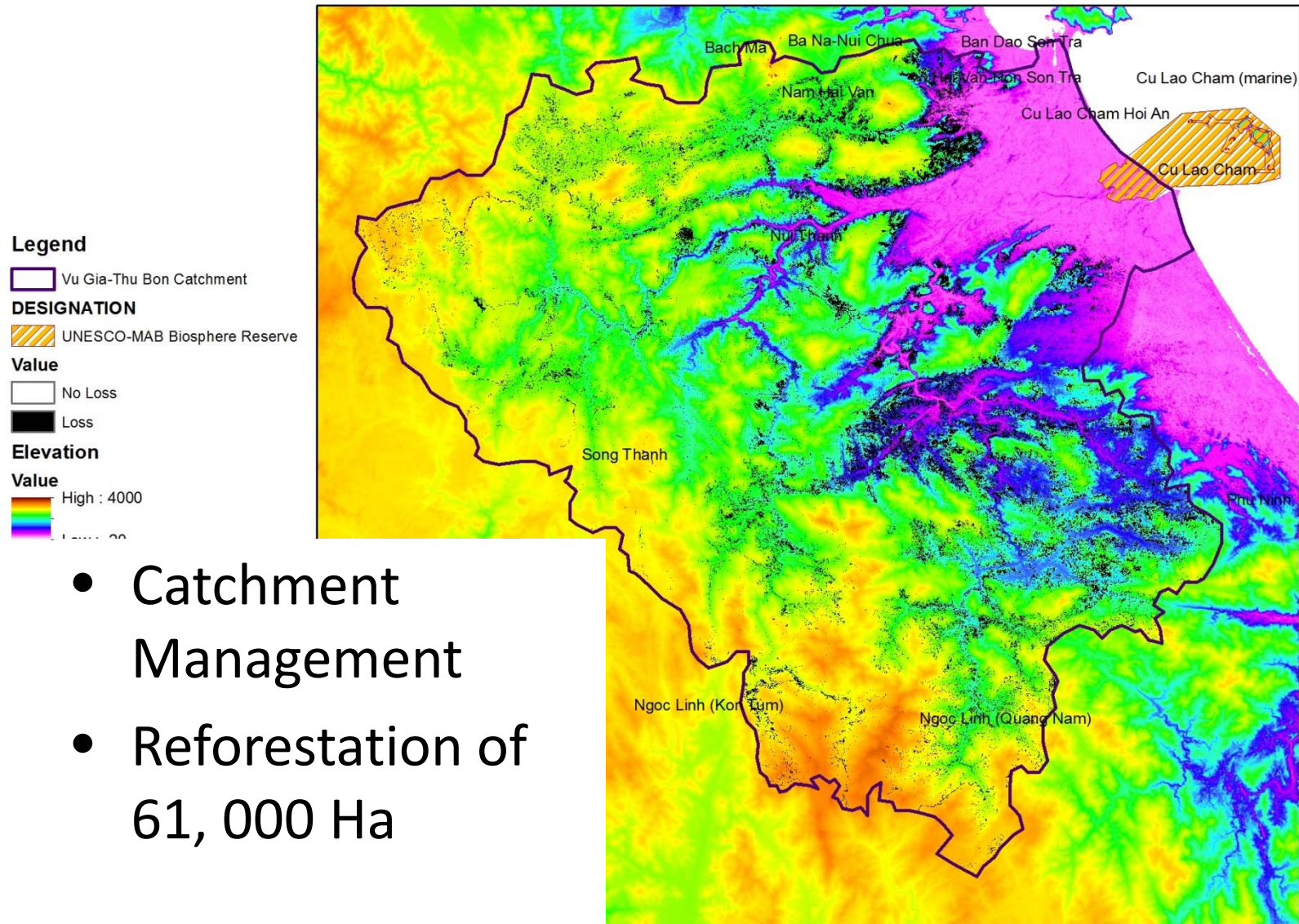
Solar deployed around the Hoi An City yield 413 MWh and 540 MWh/day



Waste to energy streams



Vu Gia-Thu Bon River



- Catchment Management
- Reforestation of 61, 000 Ha

Recommendations

- BRs are excellent sites to test integrated (synergistic) approaches to climate change adaptation and mitigation and green growth
- They should be promoted as such to bi-lateral, multilateral donors and national agencies.
- Don't be constrained to the Biosphere Reserves boundary but use it as a driver for a larger region.
- Private sector investment is important factor, but needs public sector support

Recommendations (2)

- Site based approaches permit the development of solutions with synergies between action strands. Biosphere Reserves should exploit and demonstrate these synergies.
- Smart metrics are needed to be shared to make reporting easy and support governance.

- Hansen et al, 2013, “High-Resolution Global Maps of 21st-Century Forest Cover Change.” *Science* 342 (15 November): 850–53.
- Fleitmann Et Al., 2007, Soil Erosion Recorded In A 300 Year Old Coral From Kenya
- Mbuvi, 2007, Costs And Benefits Of The Arabuko Sokoke Forest
- Mdodo, R.M. 1999 Reef Degradation Following Mass Coral Bleaching In Kenya