18. Bioenergy from marginal land

Marginal land, such as degraded tea garden or embankment strips alongside roads present a significant opportunity for biomass production without interfering with food security.

The last decade

A huge effort has been undertaken in the last decade to reverse deforestation in Bangladesh. Some of it has been successful, while some plantations have been deforested again or replaced by shrimp farms.

Assumptions of model

The model will plant Jatropha if the End Fuel Use lever is set to Liquid Fuels, otherwise woody biomass is planted. The yield for woody biomass appears very low but is based on reported results after harvesting in Bangladesh [1]

Levels

Level 1

Work already carried out by 2014: 73,000 ha marginal land as plantations, 45,000 ha Mangroves established

Level 2

294,000 ha marginal land converted to plantations, 110,000 ha Mangroves established.

Level 3

867,000 ha marginal land converted to plantations, 369,000 ha Mangroves established and 286,000 ha wetlands used for Water Hyacinth

Level 4

1786,000 ha marginal land converted to plantations, 436,000 ha Mangroves established and 952,000 ha wetlands used for Water Hyacinth. This represents the conversion of all identified, non-agricultural land, an area of the size of the Sunderbans being planted out along the coastline and the majority of still water area in Bangladesh.

Interaction with other levers

The End Fuel Use lever will decide whether woody biomass or Jatropha is planted. Dietary Protein can be set to fish farming, which also competes for the same still lakes and ponds as water hyacinth. Such aggressive planting of mangrove would probably extend the coastline, and marginally change the total area of the country. Onshore wind turbines and solar panels might compete for land area.

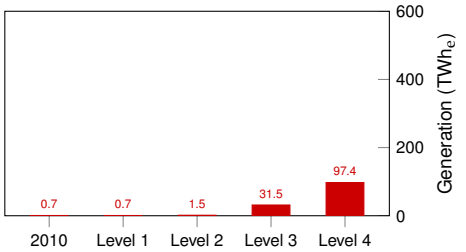

Figure 18.1: Projected in 2050, raw TWh before conversion

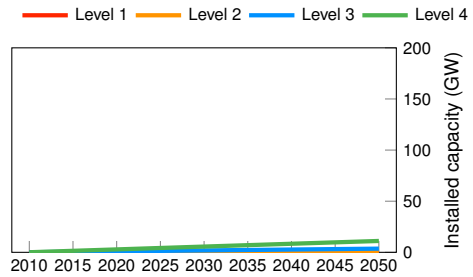

Figure 18.2: Development of capacity by scenario. Raw GWeq before conversion

Figure 18.3: Jatrohpa, a proposed bio-diesel tree

Figure 18.4: Water Hyacinth, here used for sewage treatment

[1] Nur Muhammed, et al. Reckoning social forestry in bangladesh: policy and plan versus implementation. Forestry, 78(4):373383, 2005. DOI : 10.1093/forestry/cpi045