

Scientific Notes on Trees for Bangladesh

KAROCH (*Pongamia pinnata*) NB. Alternative common names: Koroch & Karanja.

1. **Rahman, M.Mahbubur et.al. Karoch (*Pongamia Pinnata*) – An alternative source of biofuel in Bangladesh. (2014).** Conf: 3rd Internat.Conf.on the Developments in Renewable Energy Technology. Dhaka, Bangladesh. DOI: 10.1109/ICDRET.2014.6861659.

Karoch is a strong tree, long-living with low mortality, requiring little maintenance and, can survive in water-logged area, even saline water and, in drought. It protects embankments from erosion. In Bangladesh land is very scarce and most land is used for cultivation. However, the Karoch tree is best planted on marginal land, such as roadside, embankments, railway track, homestead boundaries and in barren forest land. Planting in these locations can meet with the Government's national tree planting programme. Fossil fuel dependency is reduced, local employment can be expanded thus reducing poverty and the environment better protected. (IDE Note: article provides detailed cost/benefit analysis of karoch biofuel).

2. **Degani, Erika et.al. (2022) “A critical review of *Pongamia pinnata* multiple applications: From land remediation and carbon sequestration to socioeconomic benefits.** J. of Env.Management, v.324, Dec.2022,116297. (<https://doi.org/10.1016/j.jenvjman.116297>)

The tree is known for its valuable biofuel production; its tolerance of drought, salinity and heavy metals in soils; its ability to improve soils as a nitrogen-fixing tree; restoring degraded land, bringing socio-economic benefits to communities. In terms of its carbon sequestration potential, it has been shown to be higher than many other tree species, capable of sequestering 102-128kgCO₂/tree⁻¹/a⁻¹.

3. **Aminul Islam, A.K.M. et.al.(2021). Koroch (*Pongamia pinnata*): A Promising Unexploited Resources for the Tropics and Subtropics.** In bk: Forest Biomass – From Trees to Energy. Publisher: InTech. DOI:10.5772/interchopen.93075.

P.pinnata is a quick growing leguminous tree, which can survive on marginal land, which is a promising renewable source of biofuel feedstock as well as having multipurpose uses as traditional medicine to animal feed, bio-pesticides and bio-fertilizers. Biofuel has an increasingly important role to play in contributing to future sustainable energy demands. Unlike many current major vegetable oils used as biofuel, such as soybean, rapeseed and sunflower oil, the biofuel from *P.pinnata* is a non-edible oil and thus does not compete with agricultural land and therefore food security. (IDE Note: the multiple benefits are only very briefly touched upon above, for full benefits of this tree to the environment, society and economy the full text should be read).

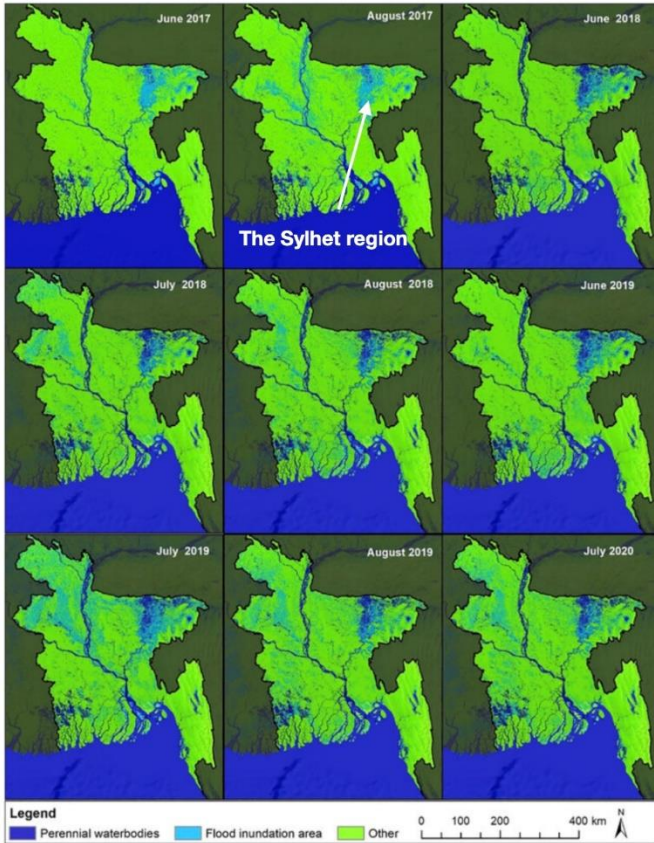
HIJOL (*Barrington acutangula*). Note: Alternative spelling: Hijal.

1. **Nath, S. et al. (2017) “Biomass stocks and carbon storage in *Barrington acutangula* floodplain forests in North East India”.** Biomass and Bioenergy. v.98, March 2017, pp. 37-42. (<https://doi.org/10.1016/j.biombioe.2017.01.04>)
Abstract: Floodplain forests serve a critical function in flood regulation and the global carbon (C) cycle due to their important role in C sink management. *Barringtonia acutangula*, a tree species adapted to floodplains has been managed traditionally over millennia as family and community forest in North East India. Prevailing traditional management of the *Barringtonia* forest restricts felling of trees while promoting uses of tree branches in fishery management and fuel wood production. Such management systems might have helped in sustaining floodplain family forests with a steady stock of biomass. However, our knowledge of their role in biomass stocks and C storage is still scanty. Therefore, the present study was undertaken to estimate the biomass and carbon stocks of *Barringtonia* forests and to understand their role in carbon sink management. The floodplain forest at the study site was stocked with 3204 trees ha⁻¹ of *Barringtonia*. Allometric models were developed using harvested tree, and these were used for estimation of biomass and vegetation carbon stocks. Among the various models tested the power model using diameter at breast height (DBH) as an independent variable fitted tree biomass in different tree components (bole, sprout, branch and leaves) adequately. Total dry above ground biomass (AGB) estimated at 552 ± 23 Mg ha⁻¹ in the *Barringtonia* floodplain forests was much larger than AGB reported for various forest types and agroforestry systems in North East India. Biomass allocation patterns revealed that out of the total biomass, the bole contributed the highest proportion (45%) followed by sprouts (27%), branches (24%) and leaves (4%). The above-ground carbon stock was estimated at 263 ± 11 Mg ha⁻¹. The quantity of biomass stock and the carbon storage in vegetation cover of *Barringtonia* forest suggest its direct influence on local, regional and even global climate.

See also: “*Shielding hijol, a floodplain tree, from climate impacts*”. Mongabay 24 Jan. 2023.

FLOOD REFERENCES.

1. **Uddin, Kabir & Mir Matin (2021). Potential flood hazard zonation and flood shelter suitability mapping for disaster risk mitigation in Bangladesh using geospatial technology.** Progress in Disaster Science 11:100185.
DOI: 10.1016/j.pdisas.2021.100185
A range of useful maps, diagrams and charts on the extent and risk of flooding.



THE VULNERABILITY OF BANGLADESH TO FLOODING

One of the lowest lying countries in the world with the highest rural population density, located in a major cyclone region of the world, Bangladesh must urgently adapt to increasing flood risk exacerbated by Global Warming.

The UNA Eastbourne's unique Hijol-Karoch tree planting programme, centred around the Sylhet region in the NE, supports the planting of the two tree species adapted well to the flood-prone regions and provides a wealth of environmental, social and economic benefits.

Figure to left: Shows extent of June, July and August floods between 2017 - 2019.

Source: Kabir Uddin:
DOI:10.1016j.pdisas.2021.10018