

and non timber forest products such as gum and seeds. By adopting the babul-paddy agroforestry system, farmers could obtain higher cash returns of Rupees seventy thousand on a short term (10 years) rotation period of trees and generate employment throughout the year as compared to paddy monoculture.

If babul is managed in such an agroforestry system, wood yield of 1640 q/ha can be expected at a reciprocal loss of 61 q/ha of paddy yield.

Advantages of Babul-paddy model :

1. The total net income from the system over a ten year period per hectare was computed to be Rs. 3 lakhs.
2. The yield of paddy obtained from short duration variety is 2.5t/ha as against 1.5t/ha from traditional varieties.
3. Babul trees pruned initially to promote the formation of clean straight bole it can fetch higher price in the market.
4. Farmers adopting scientific management of babul trees like pruning of root and tree canopy could get higher crop yield.
5. The leaves obtained from the lopping and pruning of babul trees serve as fodder for cattle during the summers.
6. Small branches obtained from the pruning of the tree canopy are used as fuel wood.
7. In addition, being a nitrogen fixing species, babul also improves the soil fertility and productivity.

8. The Babul - Paddy system serves as an insurance against failing monsoons or the vagaries of weather.

By-products of the system :

1. Timber
2. Cartwheels
3. Firewood
 - a) Small branches
 - b) Heartwood chips
4. Gum
5. Seed and dry pods
6. Bark
7. Charcoal



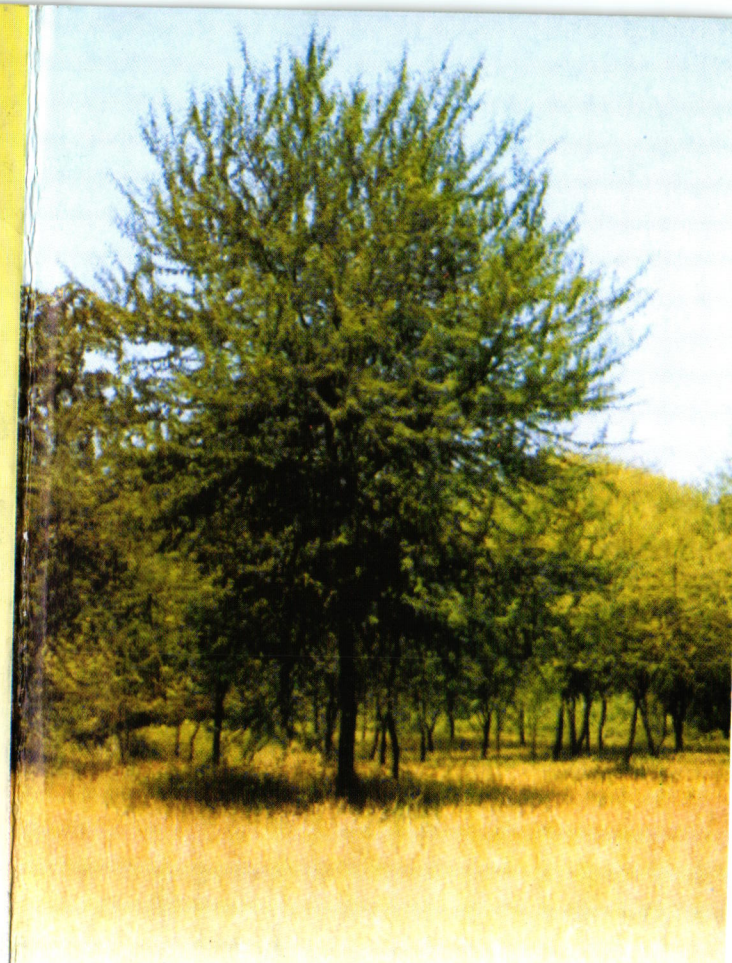
A view of Babul-Paddy system at OSR Barha (Jabalpur)

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BABUL-PADDY AGROFORESTRY SYSTEM



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2008

INTRODUCTION :

Babul (*Acacia nilotica*) is recognized as an important MPT (multipurpose tree). It is used as fuel, charcoal, timber for agricultural implements etc. Due to the paucity of availability of other valuable timbers, babul is commonly used as a substitute in furniture and carpentry works. Its bark is used for tanning and also in the fermentation of country liquor. Babul also yields an edible gum and its pods and leaves are a sources of fodder. Being a leguminous NFT (Nitrogen Fixer Tree), it helps in fixing atmospheric nitrogen in the soil.

IMPORTANCE / USES OF SYSTEM :

The system is consists of agriculture crop-paddy (*Oryza sativa*) inter-cropped with tree crop babul (*Acacia nilotica* wild ex. Del.). In Chhattisgarh, growing of Babul in paddy fields and on field bunds is a popular agroforestry practice.

Babul trees are retained or maintained by the farmers of Chhattisgarh in the paddy fields as a traditional practice. Farmers who resorted to root and canopy pruning of the babul trees could obtain higher crop yield. Biomass obtained from pruning (3rd year onwards) of *Acacia nilotica* var. *indica* (Telia) and *Acacia nilotica* var. *cupressiformis* (Ramkanta) is 1.60kg/tree and 0.80kg/tree respectively.

The trees are pruned initially to promote the formation of a clean straight bole that can fetch higher market returns. Telia babul is more useful to small farmers than the narrow crowned Ramkanta babul.

Tree/crop component for the system

Scientific Name of tree :

Acacia nilotica (Babul)

1. *A. nilotica* var. *indica* (Telia).
2. *A. nilotica* var. *cupressi formis* (Ramkanta).

Telia variety preferred by small farmers due to its higher fodder and fire wood value.

Family : Leguminosae

Occurrence : Widely distributed in the semi-arid regions of India.

Agriculture crop : Rice (paddy)

Scientific name : *Oryza sativa*

1. Short duration variety JR75 (78 days) and JR 353 (115 days) yielding 2.5t/ha

CULTIVATION TECHNIQUES

Soil : System prefers sodic and alkaline soil with pH greater than 8 and higher organic matter. Though it is a leguminous tree it can adapt well to all ranges of pH where rice is grown.

Nursery techniques of Babul

Raising of Babul seeding

- Seeds of babul can be raised in polythene bags with 1:1:2 ratio of Sand : Soil : FYM
- Seed treatment with sulphuric acid or soaking in water for 12 hours.
- Best season for sowing : 1st week of March to mid April.

Transplanting : Seedlings should be planted after ploughing but before broadcasting of rice seeds and transplanting of the paddy.

Spacing and Management of Babul

Spacing : 5 x 5 m (400 plants/ha) for first five years.

- 6 x 6m (200 plants/ha) in the 6th year.
- 10 x 10m (100 plants) in the 8th year.

Irrigation Management :

1. Bund - to store more water.
2. Reduce weeds.

Saucer around the babul tree to contain 2.5 to 5 cm water in the field.

Canopy Management :

1. Timely pruning of the canopy is essential to reduce the shade effect and for fire wood and fodder production.
2. Lateral root pruning enhances the crop yield.

Yield :

An average yield of 2.5 ton/ha of the short duration variety of Paddy as compared to 1.5t/ha for traditional variety.

ECONOMICS :

The Babul paddy system has a benefit/cost (B/C) ratio of 1.47 over a ten year period during which the trees provide a variety of products such as fodder and fuelwood (30 kg/tree), brushwood for fencing (4 kg/tree), small timber for farm implements and furniture (0.2cu.m.)