HOW POPLAR (*Populus deltoides*) BASED AGROFORESTRY TRANSFORMED WEAK RURAL ECONOMY TO PROSPEROUS GREEN ECONOMY IN NORTH INDIA?

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Agroforestry practices

- AF is practiced by millions of farmers worldwide
- In India, it is practiced traditionally by farmers, planting few trees mostly in the farm border
  - However, with recent thrust on AF and the policy released by GOI in 2014, it is going to play an important role in NRM, Crop diversification, Supply of fodder, fruits, small timber
  - Besides, it’s role in Environmental Services especially in mitigating CC has been well accepted
Different Types of AF in India

• Generally 4 types of AF is practiced viz. Agri-Silvi, Agri-Horti, Silvi-Horti-Pastoral and Silvi-Pastoral-AH

• Although systematic research was going on in NRCA and Agric. Universities, AF models did not go from Lab to Land due to lack of markets and finance

• Presently, in the states of PB, UP, Uttarakhand and Haryana, AF has been commercially highly successful

• Of many Tree combinations with Agri. Crops, the most successful trees are: Poplar, Eucalyptus, Shisam, Melia, Ailanthus, Acacia, and Bamboo.

• For commercialization of AF, WIMCO, ITC and NABARD played a big role
1. FRI and UPFD started poplar trials in the 1950s, but could not succeed mainly due to non-matching climatic conditions except one clone each of *P. casale* and *P. deltoides* clone IC.

2. WIMCO in 1980s introduced *P. deltoides* clones G-3 and G-48, out of selections from Grafton, Australia and both became successful.

3. WIMCO started raising these clones on farmer’s fields in UP under AF since 1976.

4. Farmers started asking for loans, which was beyond their capacity, hence WIMCO approached NABARD, H.O. Mumbai in 1984 for finance.
THE BEGINNING-NABARD-WIMCO PROJECT

1. NABARD in association with WIMCO and 13 Banks promoted a big clonal poplar based agroforestry project in North Indian states of Punjab, Haryana, UP and Uttarakhand during 1984 to 1995.

2. 13 commercial banks funded the project with RA from NABARD

3. It was a huge success and established Poplar clonal plantations as a remunerative agroforestry system in these states.
First PPP under AF in India-T & C

1. Supply of high quality planting stocks i.e. ETPs after field testing to farmers by WIMCO

2. Technical guidance and extension services to farmers for raising and maintaining plantations by WIMCO

3. Providing long term finance by NABARD through 13 Commercial Banks with RA from NABARD

4. Buy back guarantee by WIMCO to the farmers to purchase poplar wood on maturity with assured support price

5. R & D support provided by NABARD for development of new Poplar clones and identification of suitable agricultural crops under Poplar AF
THE CASE STUDY AND MEETING THE FARMERS

1. To ascertain the clear picture about poplar plantings, availability of clonal ETPs, yield, income, bank loan and other aspects including marketing, a study was undertaken in Chahal village of Balachaur block in Nawasar district of Punjab state.

2. The author took the assistance of WIMCO and local NABARD officials in the study and held discussions with the farmers.

3. We met two progressive farmers named, Mr. Surjeet Singh and Gurmeet Singh and interacted with them and inspected their poplar plantations.

4. The farmers had 20 ha irrigated Agr. land and raised block plantations of Poplar in such a way that they could harvest a minimum 2 ha plantation every year.

5. Thus, they had 1, 2, 3, 4, 5 and 6 year old Plants.

6. Espacement was 5 x 4 M accommodating 500 ETPs per ha.
1. Planting stocks - ETPs were mostly G48 clones obtained from WSL. It was an introduced clone.

2. Intensive management viz. soil working, weeding, mulching, irrigation and fertilization were followed.

3. Harvesting - Farmers followed a rotation of 6 years when trees attained an average height of 18 m and a girth of 90 cm at dbh.

4. Higher timber productivity of 26.46 m³/ha/year was recorded on farm land compared to just 13.65 m³/ha/year on forest land.

5. Average yield of timber in MT - 180 MT per Ha.
Marketing

1. Marketing wood was not at all a problem

2. Because there are more than 1000 wood based plywood manufacturing units in Yamunanagar, Haryana; Sarasawa and Saharanpur in UP, Ludhiana in Punjab which are ready to purchase Poplar wood

3. There is an established system of marketing through thikadars (middlemen)

4. They regularly visit the plantations and purchase the trees, when mature

5. They themselves harvest the trees and carries to the plywood factories
INCOME

1. Income - INR 0.72 million per ha based on a 2010 price of INR 4000 per MT.

2. The highest yield ever recorded in Poplar under AF in Punjab was of Capt. Ratan Singh, when his trees attained average girth of 18cm/year/tree and fetched highest price of INR 7000 per MT in 2010, which touched to INR 13,000 per MT in 2012.

3. Current price is low and hovering around INR 8,000 per MT.

4. Agricultural crops - Wheat and Sugarcane cultivated up to 3rd year, income only around 10%.

5. It was also observed that although in NABARD’s model, harvesting was fixed at 8 years, the farmers followed 6 years rotation because of good growth and very high yield.

6. Poplar plantations are extremely viable. First larger plantation in 1966 and harvested in 1981 gave B/C ratio of 1:3.22 and IRR of 28% at 13% interest. Under AF it gives more returns.
How Poplar changed the rural economy?

1. Poplar wood is the backbone of vibrant plywood, matchwood and paper industry in India.
2. Poplar under AF provides huge cash returns to individual farmers and communities engaged in cultivation, management, harvesting, transporting etc.
3. It creates huge employment in rural areas in other wood products and subsidiary industries
4. Tax free income - Sale of Poplar wood and intercrops are considered Agricultural income, hence tax free
5. Many growers gainfully used it for diversifying their business activities and creating assets.
6. It contributes to Govt. revenue too.
How did it bring green economic prosperity?

1. Only Rice –wheat cultivation yield income of INR 70,000 p.a, while Poplar alone contributed INR 1 million per acre p.a. Of Course, crop yield decreased after three year period under Agroforestry.

2. This extra income in the hands of farmers allowed them to purchase tractors, motor cycles, cars, established wood based green factories and could provide better living, food, education to their children, bringing rural prosperity.

3. There is no report of suicide among Poplar growers although it occurs frequently among Bt cotton growers.

4. Reduces pressure on forests and entail massive ecological and environmental benefits including CCM.
Poplar changed the landscape of N. India

1. A recent study indicated that poplars under agroforestry had changed the landscape of many districts of Punjab, North-western Uttar Pradesh, Terai areas of Uttarakhand, Haryana, H.P and J& K.

2. Poplar is now totally integrated in social, agricultural, silvicultural, ecological, industrial, economical and financial applications of the region and therefore, transforming weak rural economy to prosperous green economy through it’s commercial cultivation as a cash crop under agroforestry system.

3. Today poplar is a household name in N. India and the world’s largest no. of poplar trees are now in India.
Thanks for kind attention