Towards Viksit Bharat@2047
Technological Innovations and Policy Options for Eastern Region

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Towards Viksit Bharat@2047: Technological Innovations and Policy Options for Eastern Region

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Flood Prone area Identified as Fruit Hub in Bihar: A Policy Framework

Period of development: 2020 - 2023

Developers:

RK Raman, Jyoti Kumar, Jaspreet Singh, DK Singh, Ujjwal Kumar, Abhay Kumar, Akram Ahmed, Rakesh Kumar, Anirban Mukherjee, Anup Das

Background:

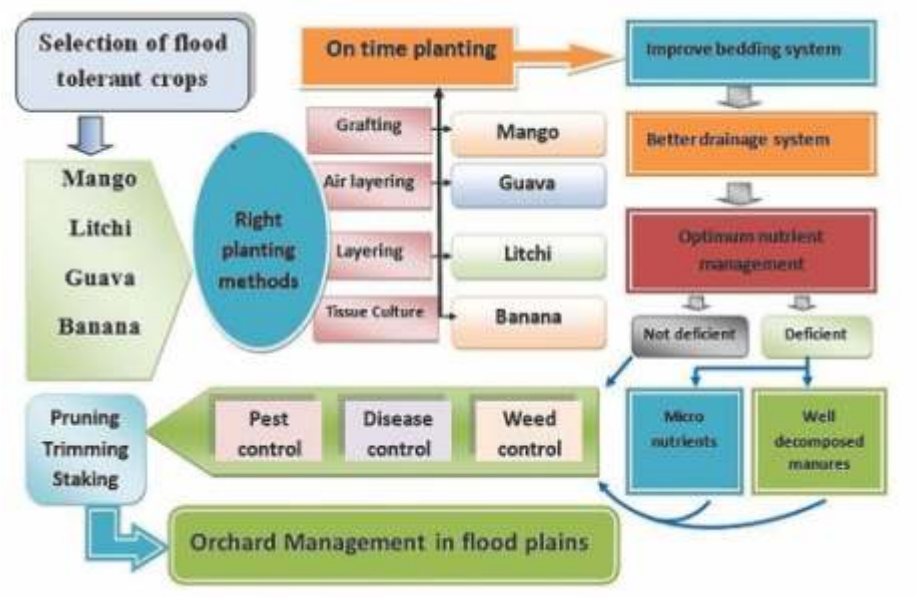
The study addresses recurrent flooding in Bihar, Eastern India, which causes significant crop losses, especially during the Kharif season, affecting farmers' livelihoods. To mitigate this, the study explores flood-tolerant fruit crops like banana, mango, litchi, and guava as alternatives. These crops provide stable income despite floods. Using advanced statistical and geostatistical tools, including the Structural Time Series Model (STSM), Kruskal-Wallis statistics, Principal Component Analysis (PCA), and GIS mapping, the study identifies productive areas for these fruit crops in Bihar. It finds the North West Alluvial Plain is ideal for banana, litchi, and mango, while South Bihar is best for guava. The STSM model forecasts an increase in banana production until 2025. The study also develops management strategies for orchards in floodplain wetlands, offering practical guidance for farmers and stakeholders on orchard management in flood-prone regions.

Description of the technology:

Flooding is a recurrent phenomenon in the state of Bihar of Eastern India. There is a massive loss of major food crops like rice and maize during *kharif* season. In this scenario flood-tolerant fruit crops like banana, mango, litchi and guava provide alternate source of income to farming communities. Keeping in view the importance of fruit production as a mitigating option of flood risks, a policy framework has been developed using structural time series model (STSM), Kruskal–Wallis statistics, principal component analysis (PCA) and GIS mapping for identification of productive area for fruit crops and its management strategies. The model identified North West alluvial plain of Bihar as highly productive zone for banana, litchi, and mango, while South Bihar alluvial plain zone was for Guava. Through the STSM forecasting model, it was predicted that the banana production in Bihar will increase continuously till 2025. The management strategies for orchards in floodplain wetland ecosystems was developed in the form of flow diagram which will be very useful to farmers and other stakeholders. Hence, this policy measure can be utilised for researchers and policy makers for devising effective strategies for production and management of fruit crops in flood plain ecology.

Commercial potential:

The technology can be offered through consultancy services, licensed, or outsourced to the State Agricultural Department, development agencies, National Horticulture Board, NGOs, and farmers' groups.



Orchard management in flood plain in Bihar

Impact:

Enhanced Resilience to Flooding, Informed Decision-Making, Improved Crop Management, Policy Development

Agro-ecoregions suitability:

Flood affected states of India

Reference:

Raman RK, Singh DK, Sarkar S, Singh J, Kumar A, Kumar U, Kumar R, Ahmed A, Mukharjee A, Mondal S, Upadhyaya A. 2023. Scenario of Major Fruit Crops in Flood-Prone Areas in Eastern India: Case Study of Bihar. *Erwerbs-Obstbau*, *65*(4), pp.1139-1151.