POLICY BRIEF

IMPACT OF CLIMATE CHANGE IN ORANGES AND SUCCESSFUL ADAPTATION STRATEGY OF ARECANUT PLANTATIONS

IN JAMPUII AND SAKHAN HILLS OF TRIPURA

Ministry of Environment, Forest and Climate Change
Government of India

GBPNIHESD

teri

Integrated Mountain Initiative

F-5, Ground Floor, Kailash Colony, New Delhi - 10048, India

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Author : Sariel Tuikhouti Reang, Young Researcher
Editor : Ms Neha Bharti, TERI
Reviewer and Advisor : Ms Suruchi Bhadwal, TERI

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BACKGROUND

Orange cultivation in Jampui and Sakhan is the economy backbone since 1960s. Due to sudden outbreak of disease and rapid yield decline in the last 10-16 years, a large area of orange cultivation is replaced by arecanut cultivation. In concern of the cause, a case was studied with the objective to understand the impact of changing climate and its role in orange mortality at the hilly area of Tripura. It also studies the alternate measures and adaptive strategies adopted by the same to combat climate change in two different locations i.e. Sakhan hills and Jampui hills. The field interviews, survey & group discussion were carried out among 100 respondents.

JAMPUI shares a boundary with Mizoram and Bangladesh. As per the census, 2011, Jampui has a total population of 12,311 (including institution and houseless population) living in a rural area of 343.74 sq. Km. Out of the total population, 11,391 ST (Schedule tribe) population, whereas negligible SC population of 26 person is recorded in the area of Jampui. The major communities of the area are Mizo and Reang. Four villages, namely Hmunpuii, Vanghmun, Phuldungsei and Sabual are selected for the study as most of the communities of the site were orange growers who turned into arecanut cultivators.

SAKHAN SERHMUN (S.K Serhmun) is located at latitude 23080" and longitude 92016" sharing a close boundary with Dhalai hills. As per the Habitation survey of Dasda Sub-Zone under North zone, TTAADC (Tripura Tribal Areas Autonomous District Council), Sakhan Serhmun hills has a total population of 3173 person in six villages out of which 50 cultivators are selected randomly from Serhmun-I, Serhmun-II, Soilung para and S.K Tlangsang for field interview and discussion. The main occupation of these hill communities is jhumming. Most of the farmers depend on the orange (Citrus reticulata Blanco) and arecanut (Areca catechu) cultivation for their livelihood.

FINDINGS

Reason Behind the decline of oranges:

The study indicates that the initial stages of disease are powdery mildew which is followed by little leaf disease, citrus greening and die back of citrus. The stem pitting like peeling of bark on orange trees is also observed on the standing few orange trees in *Sakhan hills*. It is found that the initial disease, (powdery mildew) occurred in the villages that has maximum deforesta tion activities *(Hmunpui, Vanghmun)* while the villages area that has less disturbance in the forest stands *(Tlangsang, Sabual, S.K Serhmun)* showed delayed occurring of the same disease by 2-5 year for the same disease. Therefore forest cover and deforestation plays a major role in alteration of the microclimate of the orange fruit trees in the hilly area of Tripura. Lack of biodiversity and cultivars of mandarin in the plantation site poses a threat against attack of pests and diseases. Therefore loss of biodiversity in the studied site is another cause of mass orange mortality. The study further found a large gap of technological, industrial and socio-economic development in the vision of sustainable development and climate resilient initiatives.

ARECANUT CULTIVATION

The horticulture department of the state has explored the possibility of arecanut cultivation in hill areas in the last few years. With the collective effort from Horticulture department and hill community, the orange growers shifted to arecanut cultivation as an adaptive strategy against the disease attack of orange plantations. Due to favorable climatic requirements in Jampui and S.K Serhmun, the arecanut cultivation is massively adopted in the studied site as a means of livelihood and stable farming. However, monocropping may lead to unsustainable practice in the long run, the example being mono-cropping of Orange in Jampui and Sakhan which led to widespread of disease at a faster rate.

As per survey, Beetle nut could be sold as high as 2-3 rupees per nut in the market. It is sold at a wholesale rate @ 1500-2000/sack. A sack full of beetlenut (arecanut) contains 2000-2500 nuts in fresh form. Most of the respondents have 5000-10,000 plant populations depending on their landholding. Although the standard spacing is suggested as 2.5-3 m X 2.5-3 metre, the spacing are not maintained by the growers. These communities are fetching good income from the cultivation earned upto 5-10 lakhs per year.

Range of Annual Income (in Rupees)	Number of Respondent (In respect to their Income) before the year 2010		Number of Respondent (In respect to their income) in the year 2017	
	Orange	Arecanut	Orange	Arecanut
10000-20000	5	10	58	14
20000-400000	8	NA	38	19
40,000-80000	40	NA	4	25
80000-1.5 lac	31	NA	NA	20
1.5-3 lac	7	NA	NA	16
› 3 lac	9	NA	NA	6
Total	100	100	100	100

Table : Annual Income of the Respondents (Prange & Arecanut growers)
Source: Sariel T Reang, Field interview, IMI-NMHS, 2018

The arecanut also hold many advantages over the fruit in terms of market demand, post harvest management and preservation. It can be sold in fresh form or dried form. The nut sizes are large compared to the nut obtained from lowland and plain area. The climatic requirements seem to be favorable in the hills of Jampui and Sakhan. As a result, arecanut growers have found their ultimate strategy to bring stable economy to their social life.

RECOMMENDATIONS

- In Tripura, SAPCC may include the **action plan focusing on the hill resident's development** particularly in terms of environment friendly agriculture and sustainable forest.

- In order to bridge the technological gaps, **establishment of a research hub** like Krishi Vigyan Kendra, Van Vigyan Kendra in the hills to impart sustainable development education and research in the hilly areas of Tripura is essential.

- Beside sole cultivation of orange and arecanut, **capacity building to maintain the ecological diversity** of many indigenous fruit trees growing naturally (such as Ber, Mango, Jackfruit, Papaya, wild Plum, Bael, Amla, Banana, Tamarind, Langsat (Lanisum parasiticum) locally known as Ksamai in S. K serhmum can be promoted, and provided market linkage.

- There is an urgent need to tap the genetic biodiversity of crops which is depleting in many places due to replacement of jhumming practice by stable economic practice such as arecanut, and orange plantations. This kind of practice must be re-evaluated by the policy makers for sustainable future in terms of seed storage and tapping indigenous landraces/ cultivars of many crop species. The **climate resilient steps and approach** is necessary in terms of planning for livelihood generation.

Integrated Mountain Initiative

F 5, Kailash Colony
New Delhi - 110048
: 011 - 40193747

: progcoordinator@inmi.in
: www.mountaininitiative.in
: IMI_Info