

Doubling Ginger Crop Yield through Natural Farming in Tribal Areas

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ABSTRACT

The present study is extension activity aimed at Smart Tribal Farming with main objective of Digital Transformation of Agriculture in tribal Areas for doubling the tribal farmers Income which is a component of Dr. Ashok Dalwai committee report on Doubling the Farmers Income by 2022 (DFI-2022), And beyond. A Pilot Project Initiative in a Cluster of 10-15 Tribal villages in Bharat jointly by Cluster University Kurnool, Andhra Pradesh, and Shobhit Institute of Engineering and Technology, Meerut in association with Non-Governmental Organizations (NGOs) and Public and Private Research Institutions of Bharat. The present extension activity is the outcome of collaborative efforts of Cluster University Kurnool, Shobhit Institute of Engineering and Technology Meerut along with Participatory Rural Development Initiatives Society (PRDIS) Hyderabad by conducting weekly interactive sessions through online meetings with the stake holders of the selected cluster of tribal villages in Andhra Pradesh, Telangana and Chhattisgarh. Ginger Crop Yield through natural farming in tribal areas involves implementing sustainable organic practices. In India various Tribal communities are engaged in Ginger Cultivation. The major tribes involved in ginger cultivation are The Khasi, The Jaintia, The Garo tribes of Meghalaya, The Nyishi of Arunachal Pradesh, and The Kuki of Manipur, The Naga tribes such as Ao, Angami, and Lotha of Nagaland, Santal of Jharkhand, Bonda in Odisha and Mizo tribe of Mizoram. Meghalaya is one of the major ginger producing states in India. It is identified that Soil health management, Companion planting, Bio fertilizers, and organic pest control, genetic diversity, Encouraging natural predators, crop residue Management, training and Education, Market Diversification play key role in enhancing the ginger crop yield. As Potassium and phosphorus requirements are high, nitrogen requirement is very low, natural farming approaches like Fukuoka, Subash Palekar (ZBNF), and Cho Han Kyu are suitable for doubling ginger crop yield. It can be concluded that efficient production and effective promotion become imperative for the economic development of the tribal community.

Key words : Ginger Crop, Natural Farming, Smart Tribal Farming.

INTRODUCTION

Ginger is a tropical horticultural herb and an important spice crop with high commercial value and is known for its health benefits due to phytochemical diversity hence widely used in Ayurvedic formulations and Chinese medicine in addition to food preparations and beverage industry. Ginger is native to south-eastern Asia (Bijaya BB 2018) African ginger, Black ginger, Cochin ginger, Gan Jiang, Gegibre, Ingwer, Jamaican ginger, and Race ginger are all alternate names for ginger. Over 25 variants are produced worldwide (Bhatt *et al.* 2013). Ginger crop is widely cultivated in tropical and subtropical regions of the Asia and Africa. Ginger is cultivated in most of the Indian states, 30-40 per cent of world ginger

production is from India. However Karnataka, Orissa, Gujarat, Meghalaya, and Arunachal Pradesh together contribute 65 per cent of total production in India (Rahman.H.2009). In India various Tribal communities are engaged in Ginger Cultivation. The major tribes involved in ginger cultivation are The Khasi, The Jaintia, The Garo tribes of Meghalaya, The Nyishi of Arunachal Pradesh, and The Kuki of Manipur, The Naga tribes such as Ao, Angami, and Lotha of Nagaland, Santal of Jharkhand, Bonda in Odisha and Mizo tribe of Mizoram. Meghalaya is one of the major ginger producing states in India.(Jayashree *et al.*, 2015) Ginger is a cash crop that assists in the life and economic development of many ginger growers in the country.

Botany of Ginger:

The Ginger plant (*Zingiber officinale* Rosc.) belongs to the family Zingiberaceae. The consumed portion of the ginger is rhizome, often called as ginger root which is used as a spice and flavoring agent in the food preparation. The rhizome is horizontal stem modification that produces roots. The leafy stems of ginger grow about a meter high. The leaves are 6-12 inches long elongate alternate in two vertical rows with sheathing leaf base. The flowers are in dense spikes, each spikelet with a single small yellow green and purple flower with green bracts and yellow margins. Numerous studies have shown that ginger possesses nutritional components required for wellness and its cultivation could boost the economy of many countries.

Genetic resources:

There are many genetic resources which are collected and preserved in the world. Most of the varieties used in commercial production were reported from India and China. (Prasanth *et al.* 2018). Several cultivars of ginger are grown in different ginger growing areas in India and are generally named after localities where they are grown (Xizhen 2016) Himachal, Maran, Kuruppampady, Wayanad, Varada etc. Exotic cultivars are Rio de Janeiro have also become very popular among cultivars. Maran, Nadia, Karaikkal and Rigodi are suited for high dry ginger. Varieties like Ernadu, Charnad, China and Rio de Janeiro provide high oleoresin content.

Constraints faced by the tribal farmers in rising the ginger crop:

The main constraints the ginger crop tribal farmers facing are lack of quality planting material, Climate, soil borne pathogens, and nematodes, land degradation, loss of expertise due to attitude of farmers, unsatisfactory results of pre-planting hot water dip treatment etc.

Natural farming:

“Natural Farming” is a chemical-free traditional farming method. It is considered as an agro ecology based diversified farming system

which integrates crops, trees and livestock with functional biodiversity”- Niti Ayog. Government of India has also launched a special programme Bharatiya Prakritik Krishi Paddhati Programme (BPKP) as a centrally sponsored scheme – Paramparagat Krishi Vikas Yojana (PKVY) to promote natural farming. Natural farming is a system where the laws of nature are applied to agricultural practices. This method works along with the natural biodiversity of each farmed area, encouraging the complexity of living organisms, both plants, and animals that shape each particular ecosystem to thrive along with food plants. Natural Farming builds on natural or ecological processes that exist in or around farms.

There are several states practicing Natural Farming. Prominent among them are Andhra Pradesh, Chhattisgarh, Kerala, Gujarat, Himachal Pradesh, Jharkhand, Odisha, Madhya Pradesh, Rajasthan, Uttar Pradesh and Tamil Nadu. Till now 6.5 lakh ha. area is covered under natural farming in India. Different State governments are promoting natural farming through various schemes. Prime Minister of India Shri. Narendra Modi Ji has also highlighted “Need to take farming out of chemistry lab and connect it to nature's lab” in the National Conclave on Natural Farming at Gujarat on 16th December, 2021.

The Central Ministry of Tribal Affairs has pronounced its developmental initiative “Pradhan Mantri Adi Adarsh Gram Yojana” and initiated across India in multiple phases, to convert Tribal Villages into “Model Villages”, and moving towards “Atmanirbhar Tribal Villages”. The India Budget 2023-24 has tried to revolutionize this sector by encouraging Agri Start Ups, Natural Farming and a Digital Public Infrastructure for Agriculture (DPIA) – as an Open source, Open standard and Interoperable Public Good - to help develop farmer-centric solution for crop planning. The proposed ODOP (One District One Product) Informatics Network Value Chain is the key to unlocking India's potential of tribal agricultural produces substantially. In India various Tribal communities are engaged in Ginger Cultivation. The major tribes

involved in ginger cultivation are The Khasi, The Jaintia, The Garo tribes of Meghalaya, The Nyishi of Arunachal Pradesh, and The Kuki of Manipur, The Naga tribes such as Ao, Angami, and Lotha of Nagaland, Santal of Jharkhand, Bonda in Odisha and Mizo tribe of Mizoram. Meghalaya is one of the major ginger producing states in India.

Ginger Crop Yield through natural farming in tribal areas involves implementing sustainable organic practices. It is identified that Soil health management, Companion planting, Bio fertilizers, and organic pest control, genetic diversity, Encouraging natural predators, crop residue Management, training and Education, Market Diversification play key role in enhancing the ginger crop yield. Potassium is one of the most important limiting factors for ginger production. The main practices to obtain high rhizome yield with optimal nutrient use efficiency include fertilizer application based on soil testing, top dressing K fertilizer at growth stages with peak demand, and applying enough K to balance the appropriate N and P application rates. (Lujiu Li, *et al.* 2008) As Potassium and phosphorus requirements are high, nitrogen requirement is very low, natural farming approaches like Fukuoka, Subash Palekar (ZBNF), and Cho Han Kyu are suitable for doubling ginger crop yield.

Objectives:

The present study is an outreach program of Cluster university Kurnool aimed at Smart Tribal Farming with main objective of Digital Transformation of Agriculture in tribal Areas for doubling the tribal farmers Income which is a component of Dr. Ashok Dalwai committee report on Doubling the Farmers Income by 2022 (DFI-2022), And beyond.

METHODOLOGY

Interactive and inventory approach with stake holders, followed by a qualitative survey method using literature reviews, case studies, journals, and personal interviews were conducted to collect the required information which was used to gain an in depth understanding situate the research

in an existing body of work, within a research topic of “Doubling Ginger Crop Yield through Natural Farming in Tribal Area. As an extension activity weekly interactive sessions through online meetings were conducted with the stake holders of the selected cluster of tribal villages in Andhra Pradesh, Telangana and Chhattisgarh. The data collected were summarized and discussed using a descriptive approach.

RESULT

The present study is the proposed pilot project, 'The Smart Tribal Farming' and is the outcome of collaborative efforts of Cluster University Kurnool, Shobhit Institute of Engineering and Technology Meerut along with Participatory Rural Development Initiatives Society (PRDIS), Hyderabad, as community development programme.

Under the Out reach Programme, the University proposes to (i) provide a boost to Agriculture and help Tribal Farmers, and (ii) eliminate middleman in the Value Chains to procure items directly from Tribal Farmers, through SMART TRIBAL FARMING Initiative - A Digital Transformation of Agriculture in Tribal Areas for Mani folding Tribal Farmers Income, a Component of Dr. Ashok Dalwai Committee on DFI-2022 Mission 2018, as pilot project in a cluster of 10-15 Tribal Villages in various Districts of India, in association with NGOs working with Tribal Communities in various States.

DISCUSSION

The Government of India has announced, in its Budget 2023-24 - Pradhan Mantri PVTG (Particularly Vulnerable Tribal Group) Development Mission - as part of 'Reaching the Last Mile', one of the seven Saptrishi Priorities, to provide basic facilities such as safe housing, clean drinking water and sanitation, improved access to education, health and nutrition, road and telecom connectivity, and sustainable livelihood opportunities. Creation of a Digital Tribal Platform, under this Project, facilitates digitalization of Gram Panchayat, Tribal Village and Tribal Farmer into

SMART Tribal Gram Panchayat, SMART Tribal Village, SMART Tribal Farming, and SMART Tribal Farmer leading to “Total Development of Local Area” (Atmanirbhar Village).

Expected Benefits for Tribal Communities, among the Others, include (i) Operationalizing Agri Value System through an Agri Tech StartUp and Agri Community Service Centre (CSC), (ii) Forming Value Creation Networks (NGOs, FPOs, Research & Extension etc.) and Open Innovation in Tribal Agricultural Produces, and (iii) Promoting Village Level Entrepreneurs (VLEs) for marketing Tribal Agricultural produces in both the National and International markets through virtual aggregation – Integrating with Global Value Chain. Conserving nature supports the Sustainable Development Goals (SDGs) of the UN and its Agenda 2030. Adoption of SMART Tribal Farming leads to Nature's Based Solution, and facilitates achieving manySDGs : Economy – SDG #8, 9, 10 & 12; Society – SDG# 1, 11, 16, 7, 3, 4, 5, 2; and Biosphere – SDG#15, 14, 6 and 13. Pilot project will facilitate Digital Technology and Innovation in Agriculture through synergizing Digital India, Make in India, Skill India and Start Ups India Programmes for Transformational Reforms in Agricultural Sector – SMART Farming, SMART Village and SMART Gram Panchayat in Tribal Villages. It will also contribute towards establishing a Science,

Technology and Innovation (STI) Hub, for overall socio-economic development of Tribal Communities in the Cluster of Identified Villages and will emerge as Centre of Excellence (COE) on Smart Tribal Farming, on the Farm Field, in the selected cluster of villages in Andhra Pradesh, Telangana and Chhattisgarh.

CONCLUSION

“Doubling Ginger Crop Yield through Natural Farming in Tribal Areas in the selected cluster of villages in Andhra Pradesh, Telangana and Chhattisgarh tribal areas involves implementing sustainable organic practices through NGO collaboration. There is a need for increasing the awareness, collecting scientific evidence, Capacity building, Resource access (for example seed of diverse crops and knowledge about multi-cropping system should be available to farmers), Farmer led On-Farm research has to be done in collaboration public, Private, NGOs, Farmers Organizations, etc., in the farmers' fields. The environmental, socio cultural constraints can be overcome by adopting suitable practices involved in the natural farming. Application of biological bacteria could be very promising to increase rhizome production. (Paramguru *et al.* 2012).By using resistant or less susceptible cultivars of ginger, the disease can be managed to a great extent to minimize the crop loss there by enhancing the crop yield.

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