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RESEARCH ARTICLE

JACKFRUIT - FUTURE FOOD SECURITY: A CASE STUDY OF AYUR JACK FARM OF THRISSUR, KERALA

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Abstract

In the backdrop of climate change, jack fruit (*Artocarpus heterophyllus*) plays an important role in ensuring food security. The fruit belongs to the Moraceae family and the largest edible fruit in the world. It's a large ungainly fruit grown across India especially in every part of Kerala and by 2018 Government of Kerala designated Jackfruit as the state fruit. During rainy season jackfruit is a staple food for many communities especially in hilly areas where they can use as supplement food with rice to meet nutrition security especially in tribal areas. It's far more nutritious than mangoes, oranges and other tropical fruits and having all the common starch. It's community food and commonly used by different communities in India, specially communities in hilly areas during rainy season from June –November. The four dimensions of food security, (i.e., Food Availability+ Food Access+ Food Utility + Food Stability) also cope with Environmental influence (Food Consumption +Food Production +Food Distribution). It moves beyond the concept of food supply to provide a comprehensive package for individuals to reach a state of nutritional well-being in which all physiological needs are met. Jack fruit is commercially viable for farmers as an average farmer get 50 kg from each tree and earn Rs 3000 apart from wood for fuel and leaves for domestic animals. It ensures food security in terms of (Food Availability=10,000Kg/Acre; Food Access (Appropriate foods for a nutritious diet) =95 kcal; Food Utility=40,000 Families/Acre i.e. 4member/Kg and Food Stability= 6 months). A community food system is a food system in which food production, processing, distribution and consumption are integrated to enhance the environmental, economic, social and nutritional health of a particular place (Garrett and Feenstra, 1999) i.e. realizing a food secure community. A food secure community is a place where all community residents obtain a safe, culturally appropriate, nutritionally sound diet through an economically, socially and environmentally sustainable food system that promotes community self-reliance and social justice (Hamm & Bellows, 2002). There are many communities whose staple food is jackfruit. The Kaani tribal community, Kanyakumari forests, of the Western Ghats, were a nomadic tribe solely dependent on Jack fruit (*Artocarpus heterophyllus*), and is a major staple food apart from tapioca. Despite its versatility as a tree species for general afforestation and for agroforestry programs research attention should be given on to involve jack fruit trees under system which are yet to be evolved.

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Introduction:-

Ayur Jack Farm, set up at Kurumalkunnu, Thrissur, owned by Varghese Tharakan is a beautiful tranquil farm spread across five acres of land having thousand Jack fruit trees (Plavu) and one lakh sapling. Purchased in 2003 as rubber plantation; having no water and fluctuation in the price of rubber, seriously push him for change. In 2008 as a casual visit to his wife's house, he brought a jack fruit sapling and planted in the farm. After a few days of his own effort and research, he conceived an idea of plant propagation, with a focus on the process of budding jack fruit trees. From Ayur Jack Farm he wants to find solutions to the poor access to sustainable availability of adequate nutritious foods at micro level, i.e. village level.

By 2012, he found all bore wells dug inside the farm and all the 35 open wells in and around the farm were dry. As a born farmer he didn't leave up the project. He development a Scientific Water harvesting system (underground water balancing system) where we can find not a single drop of water loss. With a simple water harvesting technique in farmlands and residential plots, the damages caused by the deluge could have been considerably reduced and all 35 open well is recharged and now no shortage of water in the area.

The farm is maintained in an organic way and all the fertilizer and pesticides are prepared in a farm. He has developed many varieties of jack fruit trees whose average height is 5 to 6 ft when it starts to bear fruits. Trees normally begin to bear fruit within two years of time. In five-acre land, he planted 1000 jackfruit trees and one lack sapling. To achieve his objective, he is offering one sapling to each students of school who visited his farm. Through his farm he wants to take the mission of one jackfruit tree for each house.

Objectives:-

1. To analyses the status of local food systems and food security in Kerala.
2. To establish the linkages between local food habits and food security.
3. To identify the major challenges to ensure food security at village level.
4. To study and analyses the future role of Jackfruit as supplement food with staple food in hill areas especially tribal hamlets in ensuring food and nutrition security.
5. Maximizing utilization of indigenous foods helps to hidden hunger and nutrition problem in indigenous community.

Research Methodology: -

In order to conduct research systematically, the following Research Methodology has been proposed:

Sample Design:

Region of Study: Ayur Jack, Thrissur, Kerala

Sampling Techniques:

The Plot developed by Farmer, Ayur Jack

Sample Size:

5 Acre of Land with 1000 Jackfruit trees and one lakh sapling.

Research Methods & Tools for Data Collection:

Survey method wereused; data are collected through schedule/questionnaire and structured interview with farmers and employees in Farm.

Study procedures

In Ayur Jack Farm you get jackfruit 365 days in all-natural form. In one acre he planted around 200 Jack fruit trees approximately at a distance of 15 ft.He dug pits in his farm and filled them with cow and goat dung, neem and cocopeat to make compost, "For every tree, uses around 3-4 kilos of dried compost as a natural fertilizer." He has planted one turmeric plant below each tree and it protects the tree from many pests and used as pest repellents. By switching to organic methods, the farm's output shoots up. The fruit-bearing jackfruit trees, hardly seven to eight ft

high and even grown in small housing plots of two to three cents or even on the terrace in a big drum. The jackfruit variety bears fruits in one-and-a-half years of time.

Access to Nutritious Food

Jackfruit is quite versatile. It can be eaten raw, cooked, ripe or unripe and tastes great in a variety of sweet and savory dishes. "Peeling and cooking the jackfruit was an activity that brought the joint family together earlier." Every part of Jackfruit is useful and a single Jack fruit tree release 13.16 tons of oxygen per year. One jackfruit in every house releases enough oxygen for each family. To meet the nutritional deficiency in children jackfruit produces high levels of vitamins and minerals.

Farm Productivity:

Farm production increased to 20 percentage every year. In 2018 the production was 40000kg from 1000 trees and by 2019 it increased to 50000kg from 1000 trees. Every year farm productivity will increase and income also shoot up.

Adequate health Benefits

The main reasons for cancer were modern foods, especially the content of Gluten. But for people with celiac disease, gluten must be avoided in order to limit the risk of other devastating health effects, such as malnutrition, anemia, osteoporosis, neurological effects, alopecia (hair loss), skin rashes, and thyroid problems. Jackfruit which contains almost every vitamin, proteins and mineral that human body needed, as well as a decent amount of fiber and zero Gluten. The jackfruit seeds contain phytonutrients such as lignans, saponins, and isoflavones play a significant role in human health.

Commercial Benefits

Every year farmers get 100 kilos worth of jackfruit from each tree and able to sell hundred tons of jackfruits annually. Demands for sapling are high and each sapling he is selling for Rs 250 to 1000 Rs. It's going to be a major source of food security and fresh air as each tree releases 13.66 tons of oxygen per year.

Discussion:-

Calculation Of Eco-Efficiency Of Food Security At Micro Level

1. Eco-efficiency of food security at micro level= Food Security/Environmental influence
2. Food security refers to food security achievement which is measured by four indicators of Food Availability+ Food Access+ Food Utility + Food Stability.
3. Environmental influence refers to the environmental impact of food security achievement with production-consumption point-of-view. Where Food Production= Irrigation+ Fertilizer+ Seeds.
4. Environment Influence = Food Consumption +Food Production +Food Distribution Consider, for one Acre = (200 Trees) Average Yield =50Kg/Tree

Food Security

1. Food Availability=10,000Kg/Acre.
2. Food Access (Appropriate foods for a nutritious diet) =95 kcal (Table 3)
3. Food Utility=40,000 Families/Acre i.e. 4member/Kg
4. Food Stability= 6 months

Food Consumption (total amount of food available for consumption in the household) = 1kg/Household

1 Households= 4 people

Food Production= Irrigation+ Fertilizer+ Seeds

For Six months

Irrigation =8 litre/tree/day

Fertilizer= 5 Kg/Tree/Year

Seed= One

Food Distribution= 10,000 Kg/Day

Eco-efficiency of food security /Acre = Food Security/Environmental influence

=10000*95*40000*0.5/400000==47500

Result: -**Table 1:-** Profit of Jack Fruit Trees/Five Acres.

	Particulars	No of Trees	Quantity (KG) /year	Price /Kg	Total (RS)
Profit	Jack Fruit Tree	1000	50000	60	30,00000
				Price/Sapling	Total
Expense		1000		500	500000
	Net Profit				25,00000

Conclusion: -

The present study shows measurement for eco-efficiency for sustainable food security. Eco-efficiency of sustainable food security needs dynamic system (Food Availability+ Food Access+ Food Utility + Food Stability) combining to cope with Environmental influence (Food Consumption +Food Production +Food Distribution). Jackfruit is one tree that can play an important role in food security and in the purification of air. The production in India is still largely subsistence in nature despite farmers growing a variety of jackfruit types. Jack Fruit eco-efficiency is promoted as a means of increasing primary production and improving food security. The production of jackfruit needs to be improved because of its 'poor people food'. It's having many nutrition values and significantly contribute to household livelihoods of farmers and as well as contributing towards soil management for sustainable environments. The prospects of the jackfruit industry are huge in India in terms of ensuring food security and a sustainable environment. So, importance should be given to research and development (R&D) and also, adapting to appropriate postharvest practices may facilitate the exportation through extended shelf life. The R &D should concentrate more value-added products, nutrition, and medicinal values, seed production, water conservation, and air purification; a package of cultivation practices and finally on economics and marketing. As an integrated cropping system, in agroforestry Jackfruit enjoys a prominent position in tropical agroforestry primarily on account of its multiple benefits such as food, fodder, fuelwood and timber values. In agroforestry areas, especially in the area of mountainous eco system where most of tribal people lives plants more Jackfruit trees,they use it for food and nutrition.

Deceleration

I hereby declare that the above information is true to the best of my knowledge and have no conflict of interest (Remove)

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