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Review: Exploring Current Status and Future Potential Organic Farming Practices in Fiji Islands.

[1*]Shifadjzic Khan, [2]Ouzani Youssouf,

[1]Master of Agriculture Candidate, Department of Food Security and Agricultural Development, Kyungpook National University

[2]Master of Agriculture Candidate, Department of Agricultural Civil engineering, Kyungpook National University

https://orcid.org/0009-0000-5994-5920

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ABSTRACT

Purpose: Organic farming in Fiji represents a sustainable approach to agriculture that aligns with the nation's rich biodiversity, cultural heritage, and commitment to environmental conservation. This study examines the potential of organic farming to enhance soil health, reduce dependence on chemical inputs, and promote ecological balance. By integrating traditional Fijian agricultural practices with modern organic techniques, farmers can increase crop yields while preserving natural resources.

Methodology: The research reviews the current status of organic farming in Fiji, key challenges, the importance of organic farming in Fiji, and future potential for capacity-building among local farmers. It also identifies opportunities, such as the growing global demand for organic products and Fiji's strategic position within the Pacific region. Organic farming in the Fiji Islands offers a sustainable approach to agriculture that aligns with the nation's ecological and cultural context. **Findings:** The findings of the review highlights that organic farming hold significant value to sustainability and production of safer food. The purpose of the review is to explore the current state of organic farming practices in Fiji.

Unique Contribution to Theory, Practice and Policy: This review contributed to policy formulations and, methods of adoption of organic principles, and their impact on environmental health, food security, and rural livelihoods. The literature also contributes that a transition to organic farming can support Fiji's goals of achieving food security, economic resilience, and environmental sustainability and the practice of traditional agricultural methods to contribute towards United Nations Sustainable Development Goals (SDGs) by relooking at agricultural practices and policies in place by stakeholders in Fiji Islands.

Keywords: *Organic Farming, Sustainable Agriculture, Biodiversity, Food Security, Traditional Practices, Ecological Balance, Sustainable Development Goals.*

INTRODUCTION

Natural cultivating alludes to it as a comprehensive perspective on horticulture that plans to mirror the smart relationship that exists between ranch living creatures, their creation, and the general environment(Young, 1997). In the 21st century, it has been noted that technological advancement has transformed the agricultural operation which aims to increase the production of commodities to satisfy the growing population at the expense of the environment. It is very evident that farm labors are substituted by farm machines, soil fertility is enhanced by chemical input and production of better yield through genetic engineering and biotechnology but there is less laser focus on the sustainability of the environment and organic means of food production. In a developing country like Fiji, the farmers are more reliant on chemicals, pesticides, and stimulants and the focus is to increase the yield and make a maximum profit without giving greater importance to the environment and the negative impact on biodiversity(Dabbert, Haring, & Zanoli, 2004). One simple solution that can mitigate the problems associated with soil degradation and the declining nutrient status of the soil is organic farming and sustainable production. Research shows that Pacific Island territories face more affliction of disease, with a high occurrence of food insecurity and food nutrition deficiencies complemented by an escalating rise in obesity, diabetes, and heart diseases(E Charlton, Russell, & Gorman, 2016).

The Green Revolution

Agriculture has been the backbone of Fiji's economy over the years. Due to the rise in demand for food and the economy, there has been a major shift from the traditional method of farming to modern where the soil health, soil biota, and environment as a whole are affected due to the selfish act of mankind in greed for wealth. Modern farming has brought many advantages but has grievous harm to the natural setting. The continuous use of synthetic fertilizers in the sugarcane belts, the use of weedicides and pesticides in vegetable farming, and various agricultural chemicals have deteriorated the environment and pose an environmental threat to future generations. There used to be a stage when individuals used to be independent with the economical creation of conventional harvests, supplements, and fiber through the utilization of native cultivating information. Be that as it may, the presentation of modernization and urbanization arranged the nourishing and dietary prosperity of the islanders (Shah, Moroca, & Bhat, 2018). The high susceptibility to climate change and natural catastrophes further impairs food security in Pacific Island Countries.

Impact of Green Revolution on the environment

To increase agricultural production and meet the demand of the growing population it was crucial to shift from traditional to modern farming. Modern farming mainly focuses on greater yield of varieties, higher doses of synthetic fertilizers, increased irrigated area, and converting larger areas of land into agricultural activities(Palaniappan & Annadurai, 2018). The manufacturers of chemicals produced damaging chemicals that greatly affected the environment and the beneficial organisms in trying to control the pest. The heavy use of fertilizers made the soil toxic and at the

same time influenced the soil microbes. The fate of the green revolution resulted in damaging the environment by destroying the soil structure, making soil vulnerable to erosion, polluting waterways, promoting and breeding pest and disease resistance species, poisoning food with heavy chemicals to achieve quick maturity of crops, irrigation projects which results in soil salinity and drainage issues and lastly, increasing the expenses of the farmer. (Palaniappan & Annadurai, 2018). The Green revolution altogether expanded food creation in non-industrial nations yet had serious natural results. It prompted soil corruption, groundwater consumption, and expanded pesticide use, influencing human and domesticated animals' well-being (Bhushan, 2017; Rahman, 2015).

Methodology

To complete this review paper, a systematic approach was employed. Relevant literature was identified using academic databases such as Google Scholar and Scopus. Keywords and Boolean operators (e.g., AND, OR) were used to refine the search. Inclusion criteria focused on peer-reviewed articles published in English, with relevance to the research objectives. Articles were screened thoroughly based on titles and abstracts, followed by a detailed review of selected full texts. Key information from each study, including objectives, methods, findings, and limitations was extracted and organized using citation management tools. A thematic analysis was conducted to synthesize findings, identify patterns, and highlight gaps in the existing literature. This methodology ensured a comprehensive and unbiased review process.

Current Status of Organic Farming in Fiji

Secretariat of the Pacific Community, which currently heads the advocacy and implementation of organic agriculture within Fiji as well as in the South Pacific more broadly (Hazelman, Bourdeix, & Tuivavalagi, 2021). The use of agrochemicals namely synthetic fertilizers and pesticides is swiftly being embraced at the semi-subsistence and subsistence level. Countries like Fiji, Tonga, and Samoa have formulations and ratios of fertilizers, specifically recommended to be used in root crops, fruits, and vegetables farming. Local food production and supply chains are greatly affected by the reckless use of herbicides. In Fiji, reports show that the use of herbicides has increased from 86 metric to 99.3 metric tons in a lapse of 3 years. An insightful customary way to deal with cultivating by defending the prized landraces and local area seed banks, substituting imports by empowering neighborhood food crops, practicing natural cultivating, and expanding coordinated efforts among cultivating and growing the travel industry area are key systems that might resuscitate the food security of the islanders (Shah et al., 2018). Below are some of the agrochemicals used in Fiji that are used to control pests and diseases and increase the productivity of agricultural commodities. However, these chemicals pose a threat to the environment and eventually harm the beneficial insects and affect human health. Organic farming in Fiji has shown potential, particularly in papaya production, with identified export markets in the USA and Japan (K. N. Stice, L. D. Tora, & A. McGregor, 2014). In Fiji, agricultural mechanization faces constraints such as the current land tenure system, poor economic conditions of farmers, and small holding sizes(Ullah & Anand, 2007). Conventional sugarcane farming, a significant contributor

to Fiji's economy, heavily relies on inorganic fertilizers and herbicides. Farmers are aware of the environmental and health effects of these chemicals, but their use remains widespread due to declining soil fertility from long-term intensive mono-cropping(Gunathilake, Prasad, & Singh, 2019).

FACT SHEET
INSECTICIDES RECOMMENDED FOR CROPS IN FIJI - A GUIDE

Insecticides are chemicals used for controlling insect pest.

Insecticide	Active ingredients	Control	Rates	Pesticide Suppliers
AgChem BT Biological Insecticide	Bacillus thuringiensis, Bt 23.7% w/v	A highly selective insecticide for use against caterpillars (larvae) of Lepidopterous insects i.e., DBM (Diamond back moth), armyworms, tomato fruit worm & pod worm.	8g/16L Water 10g/20L Water With-holding period - Nil	AgChem Ltd
Match Insecticide	Lufenuron 500g/L	An insect growth inhibitor for the control of DBM in cabbages	12ml/20L Water With-holding period -14 days	MH Ltd.
Prevathon	Rynaxypyr 5% (51.5g/L) chlorantraniliprole in the form of suspension concentrate	DBM, LCM (large cabbage moth), pod borer, armyworms, cluster caterpillar, semi looper, centre grubs, cut worm, leaf roller, leaf miners	10 - 15 mL /10L of water With-holding period 7 days	AgChem Ltd
Multi-Guard 1.8EC Insecticide	Abamectin (18g/L; 1.8%) EC	For control of whiteflies, DBM, leaf miner, citrus rust mites, two-spotted spider mites and beetle on a range of fruits, vegetables and ornamental plants.	8mL - 10mL/16L water With-holding Period - 7 days	Hop Tiy & Co. Ltd
Suncloprid 20 SL Farmers Cloprid Confidor Garden Insecticide Confidor	ImidaCloprid 20% w/v ImidaCloprid 20% w/v ImidaCloprid 20% w/v ImidaCloprid 20% w/v	A systemic insecticide for the control of sucking insects like aphids, leafhoppers, thrips, whitefly, mealy bugs and scale insects in vegetables, citrus ornamentals, rice, fruit tree and control taro beetle. For taro beetle treatment, apply once at planting and after 3 months later at 100mL/ plant.	Vegetables- 25-50mL/100L water With-holding Period- 10days Dalo - 25mL/10L water	AgChem Ltd Sigatoka Chemicals Supplies Ltd. MH Ltd.
Super-Guard 2.8EC Insecticide Farmthrin 2.5EC Suncis 25 EC	Deltamethrin 2.8% w/w (28g/L) Deltamethrin 2.5% w/w Deltamethrin 2.8% w/w	Pyrethroids, contact insecticides for the control of caterpillar, beetles, thrips, white butterfly, on a broad range of fruits and vegetables and ornamental plants. It is fast acting, stable and has moderate persistence on plants.	Knapsack: 8mL/16L 10mL / 20L With-holding period - 7 days	Hop Tiy & Co. Ltd. Sigatoka Chemicals Supplies Ltd. AgChem Ltd.
Diazinon 20 Hextar Mapa Diazinon 60	Diazinon 200g/L Diazinon 55%	For control of aphids, mites, leaf miners, leaf hoppers, flea beetles, leaf miners, earworm in rice, citrus, vegetables, tomatoes & watermelon.	Knapsack : 60mL/20L With-holding period - 14 days	MH Ltd. Hop Tiy & Co. Ltd.

Malathion 50 EC (Maldison). Malathion 840	500g/L w/v maldison Malathion 84% w/w	Organophosphate contact insecticide. For control of leaf hoppers, aphids, thrips, whitefly, mealy bugs and spider mites.	Knapsack : 40mL/14L 17mL/10L water With-holding period - 7 days	Hop Tiy & Co. Ltd & MH Hop Tiy & Co. Ltd
Chlorpyrifos 500 EC	500g/L Chlorpyrifos (anti-cholinesterase compound)	For control of wide range of insects pests include wireworm, white fly, mealy bugs, crickets, cutworm on fruits, vegetables, cereals, pasture and turf.	1mL/ L of water With-holding period - 7 days	Sigatoka Chemicals Supplies Ltd.
Steward 150 SC	Indoxacarb 150g/L	For control of caterpillars in cabbage, DBM, LCM, cluster caterpillar, semi looper, centre grubs, leaf miners, cut worms and web worms.	Knapsack: 5mL/10L water. Mist-blower: 2.5mL/L water With-holding period - 7 days	AgChem Ltd.
Bifenthrin 8 SC	Bifenthrin 80g/L	A systemic pyrethroid insecticide with a broad spectrum activity which has a rapid knockdown and a long residual action. Controls caterpillar, aphids, leaf miners, whitefly, thrips, mites and taro beetle. For taro beetle, start treatment once at planting and after 3 months later at 100mL/ plant.	Knapsack: 15-20mL/16L 20-25mL/20L With-holding period - 3 days Taro beetle 40mL /16L 50mL /20L	AgChem Ltd.
Sundothrin 25 EC	Permethrin 250g/L (25%) as Emulsifiable concentrate	A synthetic contact pyrethroid insecticide. For control of cluster caterpillar, cabbage aphids, armyworms and bean pod borer.	Knapsack : 17-22mL/16L 21-26mL/20L Spray when insects first appear and repeat when necessary. With-holding period 3 - 7 days	AgChem Ltd.

Fig 1: Some Common Insecticides used on Fiji Farms by farmers.

SOURCE: ("FUNGICIDES RECOMMENDED FOR FUNGAL DISEASES IN FIJI," 2018)

Fungicides are chemicals used for controlling fungal diseases in vegetables and crops

Fungicide	Active Ingredients	Control	
Sundomil	Mancozeb 8% Metalaxyl 64%	Systemic and Protectant Fungicide to control early and late blights, Downy mildews, moulds, brown spots and many other diseases.	
Mancozeb 80 Fungicidea	Mancozeb 80% w/w	For the control of fungal diseases in agricultural and horticultural crops.	
Manzate	Mancozeb 750g/kg	Early and late blight of potato, peanut rust, cercospora leaf spot on peanuts, early and late blights, grey and leaf mold and anthracnose on tomato, gummy stem blight, anthracnose and cercospora leaf spots in curcubits, rust in beans and anthracnose on avocado and mango.	
Dupont Kocide	Copper Hydroxide 35%	Control of various diseases of fruit and vegetable crops including anthracnose and downy mildew	
Benomyl	Benomyl 50%	Control of certain fungi like Anthracnose and Powdery mildew infesting fruit vegetables and ornamentals.	
Copper Oxychloride	Copper Oxycloride- 84.0% w/w.	For the control of Long bean- anthracnose, Black pepper and cocoa-black rot, starfruit and tobacco-leaf spot, Rubber tree- pink diseases fungus and Tea- blight leaf disease.	
Farmerthane 500sc	Carbendazim 50g/l	Phytophthora crown rot in ginger, downey mildew in brassicas seedbed, early and late blights of potatoes and tomatoes, blue mould in seedbed of tobacco.	20g/5L Water 35-40g/10L Water 50-75g/15L Water Withholding period for potatoes and tomatoes- 14 days.

Fig 2: Fungicides used on Fiji Farms.

Source: ("INSECTICIDES RECOMMENDED FOR CROPS IN FIJI - A GUIDE," 2018)

The data above from the literature demonstrates the common agrochemicals that are authorized by the Ministry of Agriculture and widely used by farmers of Fiji. However, the Fijian Government in 2019 took a positive step into minimizing the use of chemicals and fertilizers and reverted to organic farming. While holding sessions with farmers in the Western Division, Agriculture Minister Mahendra Reddy said they would advocate for farmers on new strategies and substitutes for the use of chemicals and fertilizers. There was a quick need by farmers to minimize their dependence on the use of fertilizer and chemicals(Vakasukawaqa, 2019). The former Minister for Agriculture and Waterways Dr Mahendra Reddy claimed that herbicide for case in point paraquat will never be used again in Fiji. It is also reported that the use of paraquat has been precisely proven to extant grave health risks(Daucakacaka, 2022). The above choice depended on examinations done by the Fiji Sugar Company. Fiji Sugar Company restricted paraquat quite some time ago because they found filtrates of paraquat in the sugar that was processing plant made. The farmers in the US are presently saying that paraquat ought to be restricted because it's a potential reason for Alzheimer's sickness. There are a ton of well-being worries by the utilization of paraquat

(Daucakacaka, 2022). The former Minister of Agriculture, Dr Mahendra Reddy guaranteed that options to paraquat, local farmers could expand the utilization of accessible synthetic compounds, for example, Glufosinate Ammonium, Quizalofop-P-ethyl and a lower measurements pace of Glyphosate(Daucakacaka, 2022). Contact with paraquat causes momentary well-being impacts like injury to the eyes, hemorrhages, aggravation, and consumption of the skin and different pieces of the body. Furthermore, paraquat was the second most regularly utilized method for self-destruction, including 117 cases in Fiji from 2014 to 2018. The pesticide additionally poses serious harmfulness to plants, creatures, and the marine climate(Daucakacaka, 2022).

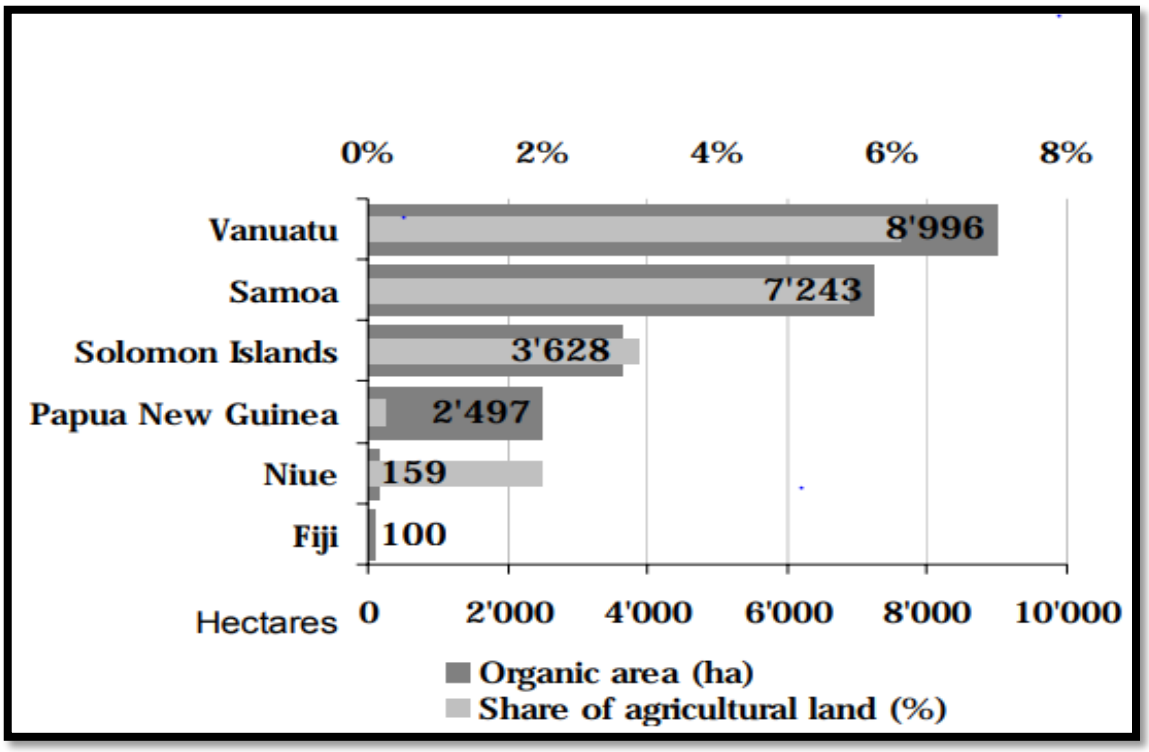

FIG3: Pacific Region Land area under Organic Agriculture in the Pacific Islands

SOURCE: (MAPUSUA, 2009)

According to the data above, there is very little area of land under organic cultivation for Fiji when compared to the rest of the Pacific Island countries. This data may be influenced due to many factors such as adaptability by farmers, awareness by the Ministry of Agriculture, knowledge and skills by farmers, and also availability of resources.

Food Category	Near organic practice (only herbicides may be used to control weeds or clear land before planting	Fully conventional (Pesticides and fertilizers used)
Fruits	Lemons, Papaya, Guava, Mangoes	Watermelon ,Oranges (orchards produced), Pineapple
Staples	Coconut, Breadfruit, Banana Yams, Swamp taro, Pandanus fruit	Taro, Rice, Sweet potato, Maize, Peanut, Cassava
Vegetables	Taro leaf , Edible ferns ,Duruka (*Saccharum edule*)	Tomato, Lettuce, English Cabbage, Chinese cabbage, Beans, Egg plants (Aubergine), Cucumber, Okra, Bele (Aibika,), Chilli, Pumpkin, Cauliflower, Broccoli, French Bean (*Phaseolus Vulgaris)*
Food Category Live stock Products	Near organic practice	Food additive and medication used
Meat	Duck, Goat, Beef	Chicken, Pork
Dairy	-	Milk
Poultry	-	Egg

Fig 4: Organic status of Food Products in Pacific Islands

Source: (Kumar, Hazelman, Tafuna'i, & Fuatai)

A Study was conducted at Sigatoka Valley, Koronivia, and cane coastal areas of Vasilev where it reveals that fertilizer use such as NPK and urea in vegetable and crop production is high.it is essentially important to use compost and manure to increase productivity. Nearly all farmers used more than one synthetic pesticide to tackle issues with pest infestation. Studies show that farmers do not have sufficient knowledge of the particular pest affecting the crop which enables them to use more than one pesticide eventually overusing pesticide(Fink, Neave, Hickes, Wang, & Nand, 2013).

Importance of Organic Farming

The ecological impacts of organic farming give off an impression of being to a great extent hopeful as opposed to traditional cultivating on a for every hectare all classifications, albeit other cultivating frameworks could perform better regarding single markers or when results are connected with how many results delivered(Haering, Dabbert, Offermann, & Nieberg, 2001). Natural cultivating is advantageous for normal assets and the climate.

Organic farming is a framework that favors the greatest utilization of natural materials and microbial manures to further develop soil well-being and to increment yield(Behera, Alam, Vats, Sharma, & Sharma, 2012). In agricultural nations, natural cultivating rehearses upswing crop yields with the least external data sources. Organic farming likewise brings down factor expenses and premium costs implying that natural cultivating frameworks are productive. Energy utilization

and contamination are by and large decreased in natural cultivating frameworks. They have bigger and more shifted greenery, bug, and bird occupants, brought about by changes in both living space construction and field the board(Stockdale et al., 2001).

Root illnesses are by and large less serious and attributable to more prominent soil wellbeing, while some foliar sicknesses can be tried in natural agribusiness. The dirt microbial local area and nitrogen accessibility assume a significant part in sickness improvement and yield. As of late, the center has moved to improve natural yield creation by edifying plant sustenance, weed control, and plant wellbeing(van Bruggen & Finckh, 2016). Ongoing sign recommends that naturally developed products of the soil contain more elevated levels of wellbeing-advancing phytochemicals, perhaps connected to more prominent plant pressure, rhizosphere microbial networks, and additionally lower accessible nitrogen(Reeve et al., 2016). Organic farming is being elevated as a way to expand the wages of Pacific Island farmers. It is typically expected that ranchers' pay for developing natural items will be higher because the costs they get for these items will be higher (K. N. Stice, L. D. Tora, & A. M. McGregor, 2014).

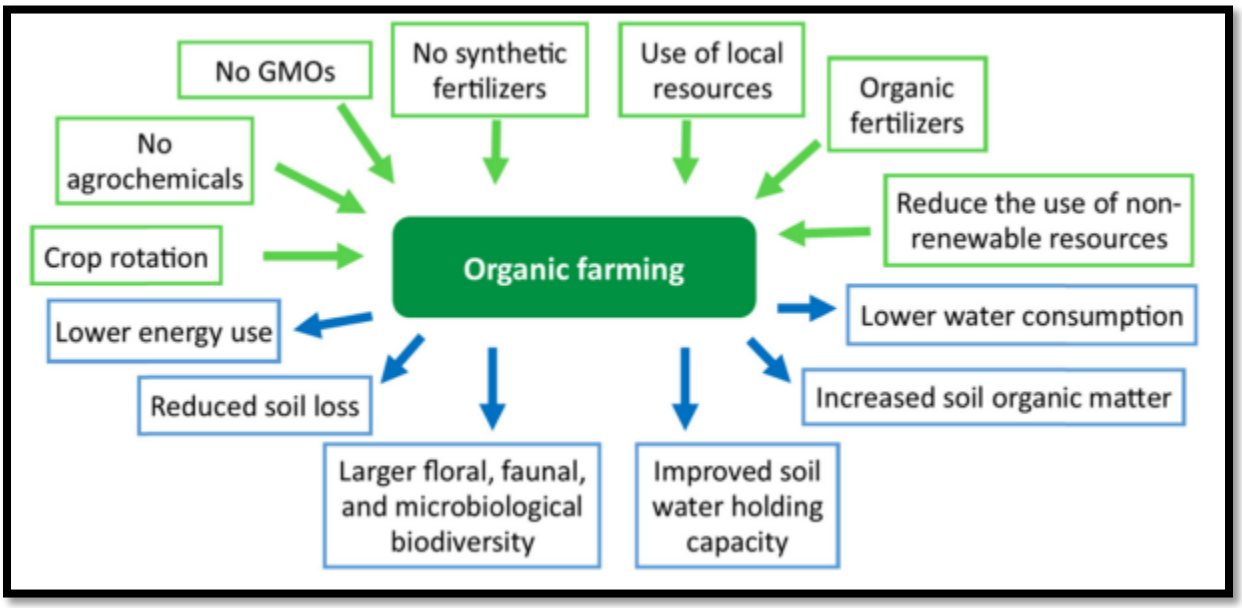

Fig 5: Overview of Organic Farming Practice.

Source: (Soni, Gupta, Agarwal, & Mishra, 2022)

Adaptation of organic farming

Organic farming incorporates returning microbial, plant, or creature material to the dirt to increment or if nothing else keep up with soil fruitfulness and organic movement. The need to keep up with ideal degrees of fruitfulness to reinforce the soundness of plants and improve their protection from pests and diseases is all around perceived(Hazelman et al., 2021).

According to the Secretariat of the Pacific People group Fiji, the accompanying performs help to further develop soil efficiency in natural homesteads:

- Establishing green excrement crops model Mucuna spp., Arachis pintoi, and Desmodium.
- Utilizing creature excrement which must be treated in the soil instead of being applied straightforwardly to plants; raise animals under coconut while staying away from anti-toxins as a treatment for creatures.
- Developing tree vegetables, for example, Gliricidia or Calliandra in neglected fields and establishing climbing beans in taro fields.
- Applying privately obtained compost inputs, for example, wood debris and kelp, to support the dirt-detached regions is particularly subject to this training.
- For compartment planting, husks, excrement, and biochar or charcoal could be added to the holder while filling it with soil. While establishing exposed seedlings, both coconut husks, dried and green leaves, excrement, and biochar/charcoal can be set in the establishing opening.

Modifications depend on the nature of the soils, and the atoll soils need special attention regarding micro-nutrients (Beltrán);

- there may be some advantage in inverting the A and B soil horizon so that more fertile soil is immediately available to the emerging roots(Hazelman et al., 2021)
- Coconut husks are rich in potassium and retain moisture and coconut leaves make good ground cover to protect soil. Do not let the coconut husks lie in a large useless heap on the farm(Hazelman et al., 2021).
- It is preferable, instead to use them for compost, to surround the base of the coconut palm with a first layer of coconut husk and a second layer of coconut leaves; this will both feed the palms and reduce weed growth(Hazelman et al., 2021).

The future potential of organic farming

Organic cultivation gives answers to most issues looked at by contemporary issues in farming and food Creation. Blend editing, Bury Trimming, Cover Editing, zero culturing, bio compost, and vermicomposting are a few additional popular, helpful horticultural practices for prevailing in natural cultivating.

i. Crop and Soil Management

Soil organic matter is a significant perspective that decides soil ripeness, which can be worked on by great cultivating practice. Fruitful soil ought to have a great water-holding limit, cation trade, and be less inclined to soil disintegration. The utilization of green excrements is one of the parts of natural cultivating that cautiously oversees soil by upgrading its organic action. Crop pivot, and between editing are associated with natural cultivating which helps in controlling weeds and overseeing compound and actual properties of soil. Animals, ranch deposits or extra, straw, and so

on are utilized for blended editing which keeps a beware of the draining of fundamental supplements from surface soil and lessens soil disintegration.

ii. Crop rotation and inter-cropping

Natural agribusiness is fundamentally subject to soil science and soil well-being. Different natural cultivating rehearses which incorporate harvest revolution, blended trimming and intercropping are accepted to help in expanding soil life by upgrading soil properties and its organic exercises. Revolutions balance soil-building crops furthermore, cash crops, and can consider uncovered decrepit periods to break weed cycles and integrate plant matter into the dirt(Mohler, 2009; Roy, Negrão, & Tester). So, a vegetable harvest can be trailed by high nitrogen requesting yield and afterward by less supplement requiring crops in ensuing years. This strategy keeps a mind weed development and helps supplement reusing in the environment to adjust soil-building crops.

iii. Crop residues

In emerging nations, tones of yield buildups are left each year which are an extraordinary wellspring of supplement reusing in soil. For the most part, crop buildups are immunized with contagious hyphae and spores which improve soil wellbeing and help in natural cultivating (Santhoshkumar, Reddy, & Sangwan, 2017). The harvest deposits incorporate straws, stalks, bristles, cobs of maize of beans, peas, potatoes, and so forth. Whipping sheds are additionally included like oil cakes, rice husks, nut shells, Indian millet, and pearl millet (Mohler, 2009). Crop residues play a crucial role in organic farming and sustainable agriculture by improving soil quality and nutrient cycling. Incorporating crop residues into the soil enhances physical, chemical, and biological soil properties, leading to increased fertility and crop productivity (Sisodiya, Vasave, & Naik, 2023).

iv. Organic manure

Bulky natural compost, which includes all-around disintegrated animal excreta like fertilizers, pee, and other ranch deposits, and viewed as Homestead Yard Compost. Massive natural excrement additionally incorporates fertilizer and in particular green composts. Manure is humus-like material delivered from natural waste because of microbial action in anaerobic circumstances. Fertilizer can be produced using ranch squander and family squander. Green fertilizers are the harvests developed to support soil. Green excrement not only expands the ripeness of the dirt by expanding surplus inorganic supplements, natural matter, microbial development, and humus yet in addition forestalls soil disintegration, filtering of supplements, and controls weed development.

v. Soil Fertility Improvement

Further use of green compost, ranch yard excrement, Surrogation, Natural fluid fertilizer, vermiculture, Guano, and Biochar are truly significant practices for feasible agribusiness. Crop enhancement is one more technique that has been advanced, for example, the development of stew, onion, green gram, cowpea, soybeans, ground nuts, and different vegetables in rice fields.

Vegetable yields are especially favorable in that those plants assist with recovering soil ripeness(Delang, 2018). Soil organic matter plays a crucial role in soil fertility by enhancing physical conditions, nutrient retention, and biological activity(Barnwal et al., 2021).

vi. Symbiotic nitrogen-fixation

Advantageous interaction helps fix environmental nitrogen into different types of nitrogen in the dirt which is promptly accessible to plants. The advantageous connection between vegetable plants and Rhizobium microorganisms is extremely valuable for nitrogen obsession in soil. Rhizobium microbes live in the root knob of leguminous plants which makes accessible climatic nitrogen in the dirt for the plants(Santhoshkumar et al., 2017).

vii. Bio-pesticide

Bio-pesticides are natural specialists creating poisons that are hurtful to the nuisances attacking plants. Auxiliary metabolites like alkaloids, phenolics, terpenoids, and so on are created as dynamic biopesticides against nematodes, bugs, growths, and different irritations. Biopesticides take a look at the development of nematodes, growths, bugs, and different nuisances and kill them. A couple of instances of biopesticides are Pyrethrum, Nicotine, Neem, Margosa, and Rotenone(Santhoshkumar et al., 2017). Biopesticides, along with biofertilizers, play a crucial role in organic agriculture by improving soil fertility, controlling pests and diseases, and promoting crop growth through various mechanisms(Parewa et al., 2021). Biopesticides are increasingly recognized as a safe and environmentally friendly alternative to synthetic pesticides in organic farming (Golijan-Pantović & Sečanski, 2022).

I. Vermicompost

In vermicomposting, certain night crawler species are utilized where they take care of natural waste materials and after processing give out the granular structure cover or vermicast known as vermicompost. Vermicomposting requires moderate ecological circumstances where microorganisms and night crawlers are utilized. Vermicompost are wealthy in micronutrients and macronutrients, phytohormones and contains microflora fundamental for the development of plants(Santhoshkumar et al., 2017). Its application in agriculture leads to reduced water usage, decreased pest and weed problems, faster seed germination, and improved crop yields(Abad & Shafiqi, 2024). Despite its numerous advantages, the widespread adoption of vermicompost in agriculture remains limited, highlighting the need for increased awareness of this valuable soil amendment(Olle, 2019).

Conclusion

Local Pacific Island producers are likely to lose organic integrity if no thorough effort is carried out to minimize the use of chemicals and pesticides in agricultural activities. Organic food consumption is growing globally, thus there should be no exception for Pacific Island Countries. Current modern farming rehearses, alongside unreasonable utilization of compound contributions

throughout recent many years have brought about not just loss of regular territory equilibrium and soil wellbeing but have additionally caused many perils like soil disintegration, diminished groundwater level, soil salinization, contamination because of composts and pesticides, hereditary disintegration, sick impacts on climate, decreased food quality and expanded the expense of development, delivering the rancher more unfortunate step by step. A developing country like Fiji has readily available resources and all efforts must be shown to speed the organic farming practices. Organic farming holds significant importance in Fiji due to its potential to promote sustainable agriculture, protect the environment, and improve public health. By reducing the use of synthetic chemicals, organic farming helps preserve soil fertility, maintain biodiversity, and safeguard marine ecosystems, which are vital to Fiji's economy and natural heritage. Furthermore, it supports local farmers by reducing dependence on costly external inputs and tapping into growing markets for organic produce. Embracing organic farming can enhance food security, foster resilience against climate change, and align with Fiji's commitment to sustainable development.

Recommendations

Policy support, community participation, capacity-building, and market development are needed to spread organic farming in Fiji. Institutional and policy support Implement nationwide organic agriculture policy, including input subsidies and transitioning farmer incentives. Establishing a Fijian organic agriculture development, certification, and promotion body. Educating farmers organic farming, pest control, soil fertility, and crop diversification. Organic and traditional Fijian skills to be shared via Ministry of Agriculture knowledge platforms. Establish global certification standards to boost local and global organic food markets. Creating organic methods for Fiji's ago-ecological zones. Developing local organic farming techniques with colleges and research institutions. These strategies will enable Fiji transition to organic farming, ensuring food security, economic prosperity, and environmental conservation.

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