

PROMOTING UNDERUTILIZED INDIGENOUS FRUIT MARKET IN SRI LANKA AS A NEW AGRIBUSINESS VENTURE: A SYSTEMATIC LITERATURE REVIEW

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Abstract

Underutilized crops remain unknown to the people and possess many nutritional, medicinal and botanical values. They contain both macro and micro nutrients, minerals, fiber and water and most of the underutilized crops are grown in local and wild areas. Therefore, these crops can be used to reduce hidden hunger among local communities and popularizing the growing and selling of underutilized fruit and vegetable varieties among Sri Lankan farmers will be a good solution in order to enhance the farm income. Therefore, this systematic literature review aimed to analyze the importance, potentials and limitations of promoting underutilized fruit and vegetable market in Sri Lanka as a new agribusiness venture. A systematic literature review is essential to promote Sri Lanka's underutilized fruit and vegetable market with the intention of offering a comprehensive, evidence based foundation. It helps identify market gaps, consumer trends, value addition opportunities and policy barriers. About twenty three articles published in the Web of Science database were selected for study using the PRISMA method. Many of the researchers found that there are lots of advantages of popularizing and growing underutilized fruits and vegetables among the consumers such as poverty alleviation, solution for hidden hunger, as a source of micro/ macro nutrients and a source of additional farm income. Though, there are some limitations for promoting the underutilized fruit crops, some of them revealed that there are some potentials to promote the underutilized crops. Furthermore, there were value addition and demand for underutilized crops among reviewed research articles.

Key words: Underutilized crops, Agribusiness venture, PRISMA, Market, Promotion

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1. Introduction

Underutilized fruit crops are those that “have not been fully utilized in terms of acreage and marketability”, despite their potential for health benefits, climate resilience, and rural income generation (Ghosh et al., 2017). These crops are not well known in marketing aspects but they are well adapted to wild areas and stressful conditions. According to the researchers conducted worldwide, these crops have high nutritional values. From ancient times, underutilized indigenous fruit crops were used in different indigenous medicinal systems like Ayurveda, Unani and Homeopathy due to their medicinal values. Processed products like jam, RTS, fruit drinks, Chutneys, candies, pickles, squashes, concentrate can be produced using underutilized fruits. These fruit crops have medicinal properties to cure the diseases like insomnia, scurvy, constipations, hemorrhage, leucorrhea, anemia, stomach ache and even contain the cooling properties to reduce the sun stroke ill effects. Underutilized fruit crops can be grown under the low inputs conditions. More research and development efforts should be taken in order to enhance the food security and nutrition through developing the underutilized fruit crops. Developing high yielding underutilized crop varieties, technologies for production and protection of the crops, post-harvest management practices are important for the development of underutilized fruit sector (Kamboj et al., 2021).

There are many underutilized fruit and vegetable varieties in Sri Lanka. Lovi (*Flacourtia intermis*), Himbutu (*Salacia chinensis*), Mora (*Euphoria longan*), Uguressa (*Flacourtia indica*), Pomelo (*Citrus maxima*), Wali Anodha (*Annona reticulata* L.), Madan (*Syzygium cumini*), stomachic anemia, improve hemoglobin in blood and diabetes, Maha karamba (*Carissa carandas*), Barbados cherry (*Malpighia emarginata*), Ceylon gooseberry (*Dovyalis hebecarpa*). Importance of these crop varieties not well known among Sri Lankan communities (Perera et al., 2022). Sri Lankans are habitually adding same fruits and vegetables for their meals and they are not aware about the value of these underutilized crop varieties.

According to the many research conducted by various researchers in different aspects on underutilized fruit crops, researchers have identified that underutilized fruit crops are rich sources of nutrients both macro and micro nutrients and also they are well known for their medicinal and botanical values among researchers. Hidden hunger can be addressed by these fruit crops due to their high nutrients content. In addition to that, these fruit crops can be used to increase the economic welfare and reduce the poverty among small households by encouraging them to sell the fresh or value added underutilized fruit crops. Hence underutilized fruit crops can be used as income and profit earner for small households. Necessary steps should be taken to promote and popularize the botanical values and nutritional values of the underutilized fruit crops among small or large scale business entrepreneurs (Chacha, 2022)

Underutilized crops contributed up to 31% of household income and 61% of food security. It can be recommended to integrate underutilized fruit crops into home gardens and Chena cultivation to boost rural employment and agro biodiversity (Bandual & Nath, 2020). Many jobs opportunities can be earned by introducing value

addition methods to the underutilized fruit industry. It is a good solution for the unemployment in Sri Lanka. Farmers can earn additional income by incorporating underutilized crops with their major crop. Sri Lankans can enjoy a variety in their meals while increasing their health by incorporating underutilized fruits and vegetables with their meals. Hence promoting underutilized crops among Sri Lankans can be a very good solution for the most of problems such as dietary problems, nutrient deficiencies, income problems, unemployment problem etc. Government should promote more awareness sessions of the underutilized fruit crops, their usage, medicinal values and benefits among Sri Lankans and make them more informed about the underutilized fruit crops and make them more interested about these unknown crop varieties.

“Fruits which have not been fully utilized in terms of acreage and marketability are termed as underutilized.” There are many advantages in underutilized fruit crops like easy to grow, hardiness in nature, ability to grow in poor, marginal and problematic soils, ability to grow in adverse conditions, ability to produce high yield under extreme weather conditions. (Gosh, Singh and Thakur, 2017).

Nevertheless, the underutilized fruit crops are valuable in different aspects such as nutritional values, medicinal values and botanical values, remaining unknown among Sri Lankan communities is problematic. Underutilized crops should be promoted among Sri Lankan communities as a promising way of earning incomes. Establishing a market for underutilized crops is one of the ways to contribute to the Sri Lankan economy. This literature review was conducted with the purpose of analyzing the importance of the underutilized crops and potentials, limitations of the promoting underutilized crops as a new business venture among Sri Lankan communities.

Promoting underutilized fruits among Sri Lankan community is a very good step that should be taken by the Sri Lankan government by providing subsidies and other needed supports in order to increase the Sri Lankan economy. Necessary actions should be taken to reduce the challenges to the promoting underutilized crops and to increase the potentials of the underutilized crops. Women who are staying as housewives can do value addition of the underutilized fruit crops as an additional income. It will provide additional income and self-satisfaction to them.

2. Methodology

PRISMA guidelines (Preferred Reporting Items for Systematic Review and Meta-Analyses) was used to conduct the systematic literature review (Liberati et al., 2009). This method contains three main steps: identification, screening, selection. (Figure 1). Search term, criteria, databases and extraction were determined at the identification step. The Web of Science was used as the database for collecting research studies related to the research objectives. Articles were searched on 4th of March 2024. About 60 research articles were resulted. When considering the step 2 screening, it includes the usage of multiple inclusion and exclusion criteria. Inclusion criteria include various research studies conducted on importance of underutilized fruit crops, potentials and limitations of the underutilized fruit crops and suggestions

to promote and popularize the underutilized crops among communities. Exclusion criteria include conference processing, non-English documents.

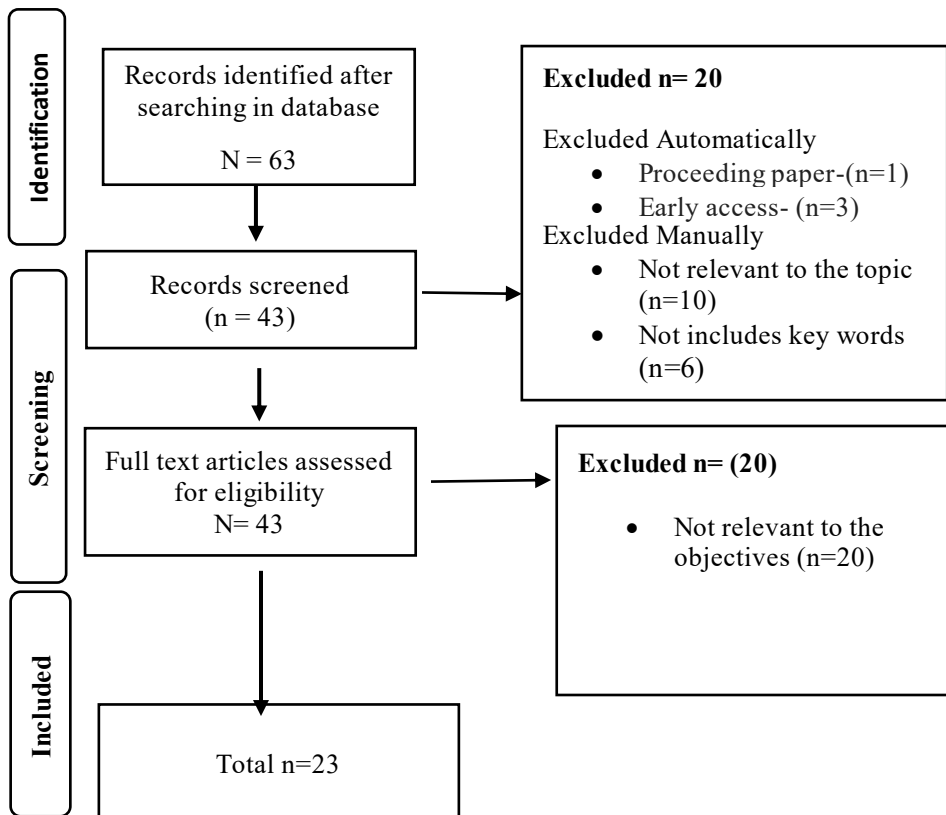


Figure 1- PRISMA Framework for the literature review conducted for promoting underutilized fruit and vegetable market in Sri Lanka as a new economic venture.

3. Results and Discussion

3.1 Importance of underutilized crops

Underutilized fruit crops play a vital role as future horticultural assets as they possess considerable amount of nutritional and medicinal value. Hence underutilized fruit crops can be used to help nations to fulfil their nutrition and food security, besides giving recreational, social and environmental importance. Due to its adaptability to local environment and being hardy in nature, underutilized crops can be used to improve the sustainable farm income under the harsh environmental conditions. For

example waste land, marginal or saline soil, rocky terrains, in the backyard or kitchen gardening and avenue plantations. Some of the underutilized fruit crops are highly significant in food processing industries. Global malnutrition can be eradicated by introducing underutilized crops directly arid and semi-arid regions of the world in order to achieve the sustainable development. (Meena et al., 2022)

Following table 1 shows some of the information on researchers who conducted the research studies on the importance of the underutilized fruit crops and their conclusions.

Table1- Important research articles of different researchers on underutilized crops

Research study	Author	Conclusion
1.Bioactives and bioactivity of selected underutilized fruits, vegetables and legumes grown in Sri Lanka: A review	(Hettiarachchi & Gunathilake, 2020)	Among the market health benefits like anti- oxidant, anti-inflammatory, anti-cancer, anti-tumorogenesis, anti-proliferative, anti-obesity, anti-hypertensive, anti-diabetic, anti – thrombotic, anti-pyretic, there are many properties which are not eventually proven to exist,
2.Anti- oxidant efficacy of selected Underutilized Fruit Species Grown in Sri Lanka	(Mallawaarachchi et al., 2021)	There is wide variation in the vitamin C, TPC, TMAC and antioxidant efficacy of selected underutilized fruit species.
3. Some neglected and underutilized fruit- crops in Sri- Lanka.	(Dahanayake, 2015)	All kind of underutilized fruits are rich sources of nutrients, vitamins and energy and their usage in ayurvedic and traditional medicine is important.
4. Underutilized crops as a resource to combat the food, nutrient and economic security in Sri Lanka.	(Nakandala & Anuruddi, 2023)	Cultivation and sustainable use of underutilized crops play an important role in foods, nutrient and economic security while improving people's livelihood.

3.1.1. Food security, Nutrition and Prevent Diseases

Underutilized fruits, nuts and vegetables contains different types of nutrients. They contain carbohydrates, fats, proteins, energy, vitamins-A, B1, B2, B3, B6 B9, B12,C, folic acid, and minerals- Ca, P, Fe, and dietary fiber. By promoting the usage of

underutilized fruits and vegetables, it can be easily cured and prevented the diseases like kwashiorkor, marasmus, night blindness, anemia, diabetes, cancer, hypertension, and hidden hunger. “Underutilized fruits and vegetables are one of the best solution for hidden hunger”. Lack of awareness of the potential of underutilized fruits and vegetables can be introduced as the main reason for most of them remaining as underutilized.

There are various nutritional properties and medicinal/ Ayurveda values in underutilized fruit crops (Dahanayake, 2015).

Table 2- Medicinal values of underutilized crops

Underutilized fruit crops	Importance
1. Katuanoda (<i>Annona muricata</i>)	Have strong anti -cancer effects , High in carbohydrates, vitamin C, B1,B2
2. Madan (<i>Syzgium cumini</i>)	To treat the diabetic and used for gingivitis conditions.
3. Lavalu (<i>Pouteria campechina</i>)	Bulk laxative agent
4. Beli (<i>Aegle marmelos</i>)	Include gastro protection properties, control diabetes, cholesterol, constipations, dysentery and diarrhea.
5. Guava (<i>Pisidium guajava L.</i>)	Used to treat bronchitis and reduce high blood pressure, curing fever and skin diseases,
6. Nelli (<i>Emblica officinalis</i>)	Enhance the immunity, high in anti-oxidants
7. Pomegranate (<i>Punica granatum</i>)	To treat the diarrhea and poor appetite and digestive disorders
8. Tamarind (<i>Tamarindu indica</i>)	Used in fever
9. Veralu (<i>Elaeocarpus serratus</i>)	To treat in diarrhea
10. Woodapple (<i>Ferronialimonia</i>)	Prevent and cures scurvy
11. Durian (<i>Durio zibethinus</i>)	Treating fever
12. Goraka (<i>Garcenia zeylanica</i>)	Fat burner
13. Gaduguda (<i>Baccauria motieyana</i>)	Used for scorpion bites
14. Kon (<i>Schleicheria oleosa</i>)	Cure itching
15. Rose apple (<i>Zyzygium jambos</i>)	Diabetes and diarrhea
16. Uguressa (<i>Flacourtia indica</i>)	Used for snake bites
17. Emberella (<i>Sondias dulcis</i>)	Used for high blood pressure
18. Palu (<i>Menilkara hexandra</i>)	To relieve the burning sensations
19. Namnan (<i>Cynometra cauliflora</i>)	Used to cure skin disease
20. Lovi (<i>Flacourtiai inermis</i>)	High in medicinal values

3.1.2. Diversify cultivation/ Increase the farm diversity.

Establishing integrated farming system by farming underutilized fruit and vegetable crops with other main crops can be used to promote nutrient dense, climate resilient and sustainable agricultural practices. According to (Pushpakumara *et al.*, 2023) underutilized fruits and vegetables should be promoted to integrate with the other crops in order to increase the agricultural biodiversity.

3.1.3. Antioxidant Potential / Natural Anti-Oxidant

Plant extracts are useful to isolate the natural antioxidants. Sri Lanka is rich in wide varieties of fruit crop species. In addition to major crop varieties, there are significant amount of fruits crops as underutilized fruit crops. Hence their nutritional, medicinal and therapeutic values are unknown. Underutilized fruit crops like Nelli and Rata Nelli contain Vitamin C, anti-oxidant and polyphenol content. Hence those two crops are considered as highly nutritious and therapeutic. In addition to that Lavalu contains pro Vitamin A Carotenoids and Velvet Apple possess higher anti- oxidant activity and used to cure diarrhea, cough, fever, dysentery. (Mallawaarachchi, Madhujith and Pushpakumara, 2018)

3.1.4. Increased income for rural poor

Market opportunities such as growing demand for food diversity and novel food products, poor farmers can generate additional farm income by growing underutilized fruit crops under low input conditions and adverse climatic conditions. (Jena et al., 2018). Underutilized fruit crops contributed up to 31% of household income in southeastern Sri Lanka, particularly through home gardens and Chena cultivation. Their integration in to mixed farming systems provides year round harvests and reduces dependency on conventional cash crops (Bandula and Nath, 2020). Underutilized fruit crops such as woodapple, beli, and nelli are not only nutritionally rich but also economically viable when processes into value added products like jams, juices and chutneys. These products have shown success in both local and export markets, creating employment opportunities and supporting rural entrepreneurship (Nakandala and Anuruddi, 2023).

3.1.5. Cultural Biodiversity

Most of the underutilized vegetables play a vital role in keeping alive cultural diversity related to food habits, health practices, religious rituals and social exchange. (Jena et al., 2018). Underutilized fruit crops contribute to dietary diversity and traditional food systems, which are essential for maintaining cultural identity and resilience. The marginalize of these crops due to globalized food systems has led to the erosion of traditional ecological knowledge (TEK), as communities shift towards commercially dominant species. (Kenz et al., 2024). In Sri Lanka many underutilized fruits like woodapple, beli, and nelli are not only nutritionally valuable but also symbolically significant in rituals, festivals, and Ayurvedic medicine. Their cultivation and use preserve language, folklore, and farming customs which are integral to cultural biodiversity. (Pushpakumara et al., 2023). Moreover, the Journal of Underutilized Crop Research (2025) highlights that promoting underutilized fruit crops can revitalize indigenous agricultural system, support intergenerational knowledge transfer, and foster community- based conservation efforts.

3.2 Potential of underutilized fruits in order to increase the economic stability of Sri Lanka.

When cultivating underutilized crops with other crops, it can contribute to the sustainable development due to its ability to ensure food and nutrition security, eco – system stability, enhancing the income of the small holder farmers and cultural diversity. The ability of the underutilized crops to resist the pest attacks and diseases is important character of underutilized fruit crops to remain healthily under unfavorable conditions. These crops show high level of tolerance to unfavorable environmental conditions. Underutilized crops such as millets, sorghum, groundnuts, lentils, and grass pea can be grown under with low water levels in nutritionally poor soils. (Singh, Sreenivasulu and Prasad, 2022).

According to the research, underutilized fruit crops can be grown under low input levels and adverse soil and environmental condition. Hence in Sri Lanka also farmers can grow underutilized fruit crops with low budget and earn high profit. They can contribute to the economic development of Sri Lanka.

The crops which are not cultivated commercially on large scale and not traded widely called as underutilized fruit crops. These crops are grown, traded and consumed by people live in local areas. Underutilized crops have many advantages such as easy to cultivate, hard in nature, yielding even under adverse environmental conditions. Hence exploitation of underutilized crops can be a good solution for problems such as health and nutrition insecurity, poverty and unemployment. Underutilized fruit crops have potential to provide nutrients to the poor and needy tribal by achieving the nutrient requirement of the vulnerable groups. (Nandal & Bhardwaj, 2011).

3.3 Present Market Demand for underutilized fruit crops and value addition of the underutilized fruit products.

3.3.1 Demand for underutilized crops

When considering the underutilized fruit and vegetable harvests, it can be separated as naturally grown crops, having few qualities, not broadly developed yet, seldom found in market and are not developed economically. (Kamboj et al., 2021) according to that research, necessary steps should be taken to develop a market for underutilized crop.

Underutilized vegetables give wide range of crops in order to enhance the productivity and food security and to meet new market demand. There is a growing demand from the customers who are in developed and developing countries for food diversity and new foods. Hence Creating new market niches for underutilized crops is important to meet that demand. Poor farmers can grow these underutilized fruit crops under low inputs or adverse environmental conditions. Hence they can acquire additional market income from selling underutilized fruit crops in the market. Underutilized fruit crops possess comparative market advantages over commercial crop varieties (Jena et al., 2018)

In Sri Lanka also consumers are eager to try new fruit varieties and vegetables. Hence necessary steps should be taken to popularize the underutilized fruits and vegetable among Sri- Lankan communities. It will affect to the income growth of the small scale farmers in Sri Lanka. Underutilized crops should be used to enhance the Sri Lankan economy.

Typically underutilized crops are not traded as commodities (Narmila & Amuthenie, 2015). Diversification and popularization of underutilized crop varieties is important. This can be achieved through the establishment of proper processing and marketing methods for underutilizing crop varieties such as convert them in to various types of products (Barthwal et al., 2022)

3.3.2. Value Addition

Socio economic status of the rural families can be improved through the value addition of underutilized crops/ removing the pulp and drying. Examples for processed products are jam, jelly, and preserved, candy, glazed fruits, juice, beverages and squash, wine, chutney, sauce, pickle, dehydration, frozen puree, canning, confectionary. (Nandal & Bhardwaj, 2014).

There are different type of value addition methods to different underutilized fruit crops.

Value addition can be used as a method of women empowerment. According to the (Chandra et al., 2018) consumers always demanding naval, delicious, attractive and nutritious food products. Hence they have identified and presented different types of innovative products, produced using underutilized fruit products. Producers can create nutrient rich and innovative products using these naturally available cheap fruits.

The process of converting product from it natural row state, in to a more valued state, called as value addition. The main aim of value addition is to enhancing the economic value and the consumer's appeal of an agricultural commodity. There different types of value addition methods such as packaging, labelling, dehydration and drying, freezing, processing, and preservation processes. For example different types of value addition methods can be used to jack fruits such as chips, pickle, RTC jack fruit, dehydrated jack fruit, jack fruit candy, canning, etc. (Gupta et al., 2023)

One of the example for value addition process is preparing wood apple jam, when preparing wood apple jam, first of all selection and preparation of the fruit should be done. 500g of wood apple pulp should be separated and sugar should be added as 1:1 level. This mixture should be cooked slowly with occasional stirring for 15 min. Citric acid 1% and 1 pinch of salt should be added. Cooking should be conducted till it becomes 68.5⁰B. Mixture should be allowed to cool down and should store in refrigerator for better usage.(Ravani & Joshi, 2014)

3.4 limitations of promoting as a commercial crops

3.4.1 Climate changes.

(Ratnayaka Sujith, Kumar Lalit, 2020) revealed Underutilized fruit crops can be used to improve the Sri Lankan economy, food security and nutrient supplement of Sri Lankans. Effects of undesirable climate to the underutilized fruit crops can be reduced by identifying the most suitable areas for each underutilized fruit crop. Findings of this research study reveals that climatic changes can increase the vulnerability of the underutilized crops and shrink their potential grown areas. It can be negatively affect to the future food security, human nutrition and well-being. According to the findings dry and intermediate zones are most vulnerable for losing suitable areas for growing underutilized fruit crops due to climatic issues. Hence it should be focused to adapt climate change mitigation strategies and consider on developing climate resilient underutilized crop varieties.

3.4.2 Losing the significance of the underutilized fruit crops among the new generation.

There are many reasons for losing the significance of the underutilized fruit crops among the new generation. They are urbanization, changing food habits, not having proper cultivations of underutilized fruit crops, most of the underutilized plant species are fruits crops. They can be found in wild habitats and home gardens. Commonly found in many rural areas of the country. Most of the people are habitually using fruits banana, papaya and mango daily to supply need of the vitamins and minerals. They don't consider about underutilized fruit crops (Bandula et al., 2023)

3.4.3 Barriers and constraints facing the promotion of underutilized fruits and vegetable species for markets and consumption.

According to the research study , lack of a coordinated strategy for research and development, lack of a coordinated strategy for production and marketing, Scarcity of quality planting material, Inadequate financial and non-financial incentives to create a conducive growing environment, Lack of systematic data on cultivation and production, Lack of guidelines for seed collection and production, Consideration of indigenous fruits and vegetables as inferior, mainly due to limited awareness of consumers, lack of awareness of recipes and culinary practices can be introduced as the barriers and constraints.

3.4.4 The key barriers/constraints and major challenges limiting the mainstreaming and use of underutilized crop species in Sri Lanka.

There are many barriers such as lack of coordinated and enabling policies-disconnect between the agriculture, nutrition, health, education, conservation and trade sectors and lack of attention from policy makers, lack of institutional capacity and human resources skills - lack of institutional capacity and human resources' skills to undertake plant breeding and germplasm collection, characterization, and utilization using advanced and social models, lack of knowledge on agronomy and crop improvement- limited characterization of underutilized species and their

varieties, and limited breeding and selection efforts and quality planting material production, lack of sufficient seed and planting material, environmental changes, changing land use patterns, climate change, pollution and biodiversity loss impacting species' distribution.

Other constraints are socio-economic changes- increasing poverty and illness in communities, changing food habits, poor attitudes, loss of traditional knowledge of underutilized species, competition from commercialized crops and advertisements, Lack of research, extension, data and information- limited and scattered research and data, poor links with nutritional outcomes and biodiversity, negative perceptions and attitudes towards these crops and their products, lack of capacity and quality extension services, weak promotion and awareness- lack of scientific evidence on the species' nutritional and medicinal qualities, weak outreach activities and uncoordinated awareness campaigns, lack of credit facilities and loan schemes for farmers and entrepreneurs, lack of national recognition of the importance of fruit and vegetables compared to major crop and disorganized marketing -inefficient processing and value adding, and disorganized or non-existent value chains (Pushpakumara et al., 2023)

3.5 Promoting as agribusiness venture

3.5.1 Collaborations and partnerships

It is important to collaborate with research institutions, NGOs, and private sector organizations to create a holistic approach to underutilized crop development. Bandula, Kibria & Nath (2023) – with the intention of adding value to the underutilized fruit crops this research study suggest to establish the proper institutional support both technical and financial. Relevant public and private institutions should take the needed actions in order to provide loan facilities, to build infrastructure and to train local farmers for value addition. Through this, local economic conditions can be improved. Engage with local communities and empower them to take ownership of these initiatives is important.

We can introduce vitamin and minerals to the contemporary diets by the usage of micronutrient rich underutilized and neglected species by transplanting them to the home gardens from their wild habitat. Programs should be implemented to increase the consumption level of the underutilized crops in the urban areas. Commercial Farming of underutilized fruit crops should be developed further. Advices should be given to the farmers on how to grow underutilized fruits methodically. Promotion can be done by highlighting their importance, Promote the marketing of underutilized. Neglected and underutilized fruit species (NUFS) play a significant role in Sri Lanka's economy, food security, and nutritional requirements. These lesser-known fruits have the potential to contribute in several ways:

3.5.2 Promoting awareness and research

When promoting underutilized fruit crops in Sri Lanka, identifying and acquiring live samples of the underutilized fruit crops, establishing plant arboretum for them,

promoting studies/research on underutilized fruit crops and multiplication of them for the future usage should be done.

Nutritional and medicinal values of the underutilized fruit crops should be informed and promoted Among Sri Lankan communities. Through that we can improve the demand for the underutilized fruits in Sri Lanka and it will directly related to the better establishment of an underutilized fruit and vegetable market in Sri Lanka. (Dahanayake, 2015).

3.5.3 Agroforestry and Home gardens

Encourage agroforestry practices that integrate underutilized fruit trees with other crops.

Promote home gardens where families can grow different types of fruits for personal consumption and income generation. Hence underutilized fruit and vegetables plants can be sold to the required home gardens. It will be a new way of income generating for the farm owners. (Kamboj et al., 2021).

3.5.4 Market development

Create market demand for underutilized fruits by promoting their unique flavors, health benefits, and versatility and Collaborate with local markets, restaurants, and food processors to incorporate these underutilized fruits into their offerings. (Kamboj et al., 2021)

3.5.6 Value addition and processing

Exploring value-added products such as jams, juices, dried fruits, and snacks made from underutilized fruit is important. Establishing processing facilities to add value and extend the shelf life of these crops is important. (Kamboj et al., 2021).

Underutilized fruit crops are rich in antioxidants and dietary fiber, making them ideal for functional foods. However, challenges such as perishability, lack of awareness, and limited processing infrastructure hinder their commercialization. They advocate for low cost, farmer- friendly technologies and community based processing units to promote rural entrepreneurship. (Rawat and Das, 2020).

3.5.7 Establishing systems for exploitation

Under this aspect, Domestication of likely wild species through residence development, Location explicit harvest arranging as per Agro-climatic reasonableness of the area should be finished, broadening the hereditary assets, their preservation, and documentation, Dissemination of information to the ranchers, Expansion of framework offices, Exploration and use of therapeutic properties, Developing handling units, Conducting research work, Developing quality planting materials, Providing planting materials to the cultivators, Development of significant worth included items and Breeding assortments for high return and impervious to biotic and abiotic stresses can be presented(Kamboj et al., 2021).

4. Conclusion

Many studies have found that there are many advantages of popularizing the underutilized fruits and vegetables among consumers. It can be concluded that underutilized crops are in a reasonable position to capitalize as a source of addressing rural food and income security. However, number of aspects need to be developed in terms of further strengthening the sustainability of effective utilization of underutilized crops among rural communities in Sri Lanka. Farmers can earn additional income by integrating underutilize fruits and vegetables with their major crop varieties. Underutilize fruits and vegetables can be a solution for hidden hunger, malnutrition and also they can be used for the medicinal purposes. Underutilized fruit crops are rich in natural antioxidant. In the Sri Lankan context, low job opportunities is one of the major problem. This problem can be solved by guiding the jobless people for starting to grow and sell the underutilized crops as a new agribusiness ventures. Value addition of underutilized fruits can be used to generate the new job opportunities, especially empower the women in Sri Lanka. Some of the research revealed the limitations and potentials of popularizing the usage of underutilized fruit crops among Sri Lankan communities. Therefore, necessary steps should be taken to reduce the limitations and increase the potentials of the underutilized fruit crops.

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