



A study on identification, documentation and marketing behaviour of underutilized vegetables in Kalyana Karnataka region

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Abstract— A study was conducted in Kalyan Karnataka region of Karnataka state during the year 2023-24 to identify and document the underutilized vegetables of the study area. The exploratory research design was employed in conduct of the study. Primary data were collected by using the questionnaire prepared for the study, a snow ball method of data collection were used to collect data due to lack of underutilized vegetables collecting and marketing farmers list. The suitable statistical tools like frequency and percentage are used for the analysis and tabulation of the data. In this study ten underutilized vegetables were identified, their common name, scientific name, family, health benefits and their images were documented. The identified vegetables are pigweed, joyweed, basale, nelabasale, brahmi, pointed gourd, moringa leaves, little wild gourd, safflower leaves and chickpea leaves. The results of the study revealed that majority of the farmers sold these underutilized vegetables directly to the consumer and low percent of middle men involved in the marketing. With respect to consumption pattern majority consumed these vegetables seasonally followed by rarely and never. Lack of knowledge regarding health benefits (92.86%) and non commercial production system (90.00%) are the major constraints for the underutilizing these vegetables. Vast potential of underutilized vegetables contributing significantly to the livelihood of the rural population, enhancing food and nutritional security and fostering sustainable agricultural development, hence government has to initiate the promotional activities for these underutilized fruit crops and provide the platform to sell their vegetables at suitable price. Underutilized vegetables in the Kalyana Karnataka region offer a unique opportunity to promote nutritional diversity, climate resilience, and local food traditions. With proper support through policy, awareness, and market linkages, these neglected crops can become mainstream contributors to sustainable agriculture and rural development.



Keyword— Kalyana Karnataka, Underutilized vegetables, marketing, consumption

I. INTRODUCTION

Rural communities in India, despite their agricultural roots, frequently tackle with hidden hunger and micronutrient deficiencies. Staple diets, though calorie-rich, often lack the diverse vitamins and minerals crucial for optimal health. This is where underutilized vegetables step in as unsung heroes. India is blessed with immense agro-biodiversity, especially in rural and tribal regions. Among this diversity, underutilized vegetables are

traditional crops that are grown on a small scale and rarely found in markets but play a vital role in local food systems. Despite their nutritional and ecological value, these vegetables are often overlooked in modern agriculture and diets. Underutilized vegetables, also called "minor vegetables" or "neglected crops", are traditional edible plants that are grown locally and often wild-harvested, are not widely cultivated commercially, have potential for nutrition support, income generation and climate resilience. In the Kalyana Karnataka region, many

underutilized vegetables are fulfilling the nutritional requirement of the rural population.

The Kalyana Karnataka region (formerly known as Hyderabad-Karnataka) comprising districts such as Kalaburagi, Yadgir, Raichur, Bidar, Ballari, Koppal, and Vijayanagara are rich in biodiversity and traditional agricultural knowledge. Despite this, many indigenous vegetables that were once part of local food systems are now underutilized and at risk of being forgotten. These underutilized vegetables, often grown in kitchen gardens, forest edges, or as intercrops, have significant potential to improve nutrition, food security, and incomes in rural and tribal communities of the region.

Importance of Underutilized vegetables

Underutilized vegetables, also known as neglected, orphan, or minor crops, hold immense and often underestimated importance across various dimensions:

1. Nutritional security and public health:

- **Micronutrient Powerhouses:** This is arguably their most significant contribution. Many underutilized vegetables are exceptionally rich in essential vitamins (like A, C, E, K, B-complex), minerals (iron, calcium, zinc, magnesium, potassium), dietary fiber, and antioxidants (phenolics, flavonoids). They can significantly combat "hidden hunger" – micronutrient deficiencies that affect billions globally, leading to compromised health, immunity, and cognitive development.
- **Diverse Nutrient Profiles:** They offer a wider array of nutrients than the handful of commonly consumed vegetables, promoting dietary diversity and a more balanced intake of essential compounds.
- **Bioactive Compounds:** Many contain unique phytochemicals and bioactive compounds with medicinal properties, contributing to disease prevention (e.g., against certain cancers, heart diseases, diabetes) and overall well-being.
- **Affordable Nutrition:** For many low-income communities, these vegetables are often grown with minimal inputs or collected from the wild, providing an accessible and affordable source of vital nutrients.

2. Climate resilience and sustainable agriculture:

- **Adaptability to Harsh Conditions:** A key characteristic is their inherent resilience. Many underutilized vegetables are remarkably tolerant to adverse agro-climatic conditions such as

drought, heat, poor soil fertility, salinity, and specific pests and diseases. This makes them crucial for developing climate-smart agricultural systems and ensuring food production in marginal or vulnerable environments.

- **Low-Input Farming:** They often thrive with fewer external inputs like synthetic fertilizers and pesticides, reducing environmental impact and promoting sustainable, ecologically friendly farming practices.
- **Agro-biodiversity Conservation:** By encouraging the cultivation and consumption of these diverse species, we contribute to the conservation of agro-biodiversity, which is vital for the long-term health and resilience of our food systems. Reliance on a narrow genetic base of major crops makes agriculture more vulnerable to shocks.

3. Economic opportunities and livelihoods:

- **Diversification of Income:** For smallholder farmers, cultivating underutilized vegetables can offer alternative income streams, reducing over-reliance on a few staple crops. Their often shorter growth cycles can provide more frequent harvests and cash flow.
- **Niche market development:** As consumers become more aware of health and sustainability, there's growing interest in diverse and traditional foods. This creates niche market opportunities for underutilized vegetables, potentially fetching better prices for farmers.
- **Value Addition and Processing:** Developing technologies for processing these vegetables into value-added products (e.g., flours, dried leaves, pickles, functional foods) can extend shelf life, increase market value, and create new entrepreneurial ventures in rural areas.
- **Employment Generation:** Their cultivation and processing can create employment opportunities throughout the value chain, benefiting rural communities.

4. Cultural heritage and traditional knowledge:

- **Preservation of Indigenous Knowledge:** Underutilized vegetables are often deeply intertwined with local culinary traditions, indigenous knowledge, and cultural practices. Promoting those helps preserve this invaluable heritage and the unique food systems of various communities.

- Food Identity: They contribute to the unique food identity of regions and communities, fostering pride and connection to local resources.

5. Ecosystem services:

- Soil Health: Some underutilized legumes can fix nitrogen, improving soil fertility and shelter the local soil fauna. Others contribute to soil structure and organic matter.
- Pest and Disease Management: Their diversity can break pest and disease cycles, contributing to healthier agro-ecosystems.

Underutilized vegetables are not just "famine foods" or curiosities; they are a vital, yet largely untapped, resource for addressing global challenges related to food security, malnutrition, climate change, and sustainable development. Investing in their research, promotion, and integration into mainstream food systems is crucial for a more resilient, nutritious, and equitable future. The Kalyana Karnataka region is a treasure of underutilized vegetables, many of which are crucial for the nutritional and economic well-being of its rural population.

By looking in to the nutritional and health importance of underutilized vegetables a study was conducted with following objectives,

1. To identify and document the underutilized vegetables of Kalyana Karnataka region

2. To know the marketing behaviour and consumption pattern of the underutilized vegetables
3. To elicit the constraints in utilizing the underutilized vegetables by the rural population

II. MATERIALS AND METHODS

The present study was conducted in Kalyan Karnataka region of Karnataka state during the year 2023-24. Kalyana Karnataka region was purposively selected for the study. Kalyana Karnataka region comprising six districts Viz. Klaburagi, Bidar, Yadgir, Raichur, Ballari, Koppal and Vijayanagar district. The exploratory research design was employed for the study as the study try to explore the underutilized vegetables collecting and marketing farmers. Due to lack of underutilized vegetables collecting and marketing farmers list in JDA office neither NGO nor Private firms, snow ball method of data collection were employed to collect primary data. Suitable statistical tools such as frequency and percentage were employed to analysis and tabulation of the data.

III. RESULTS AND DISCUSSION

Ten underutilized vegetables from the Kalyana Karnataka region have been identified. Their common name, scientific name, family, health benefits, and images are documented in the table below,

Table 1. Identification and documentation of underutilized vegetables

Sl. No.	Underutilized fruits	Common Name	Scientific Name	Family	Health benefits	Image
1	Pigweed	Harivesoppu, Rajgiripallya	<i>Amaranthus viridi</i>	Amaranthaceae	Rich in Vitamin A and C as well as other important minerals, such as iron, manganese, calcium, zinc, copper and magnesium. Adding pigweed into your daily diet can improve your health and immunity immensely. Consuming pigweed can help alleviate fever, headache, nausea, stomachache and other digestive disorders.	
2	Joyweeds	Honaganesoppu	<i>Alternanthera versicolor</i>	Amaranthaceae	Rich in protein, fiber, antioxidants and low in fat. It is also excellent source of iron, zinc and vitamins. It can be used in making delicious dishes like salad, dosa, idli, sundal, fritters, dal, khichdi.	

3	Basale	Basale soppu, Malabar spinach	<i>Bassela Alba</i>	Basellaceae	Malabar spinach is an excellent source of iron, calcium, Vitamin C and Vitamin A. It contains high protein and great source of phosphorus and potassium. It has great amount of antioxidants such as lutein and beta carotene	
4	Nela Basale	Nelabasalepal lya	<i>Portulaca oleraceae</i>	Portulacaceae	Herbal medicine for pain relief. Lowers blood sugar and enhances eyesight. Contains saponins, alkaloids and flavanoids. Vitamin C, B2, B3, carbohydrate.	
5	Brahmi	Brahmi plant	<i>Bacopa monnieri</i>	Plantaginaceae	Is an incredible rejuvenating herb traditionally used to support the brain and nervous system. This small, creeping perennial plant is one of two powerful herbs often referred to as brahmi and has been used for centuries to promote memory, intelligence, and concentration.	
6	Pointed Gourd	Thonde kai, Ivy gourd	<i>Coccinia grandis</i>	Cucurbitaceae	It is considered a nutritious vegetable with potential health benefits like it promote digestive health by preventing constipation and supporting regular bowel movements. It helps to protect the body from oxidative stress and helps in lowering the blood sugar levels by improving insulin sensitivity.	
7	Moringa leaves	Nugge kai pallya	<i>Moringa oleifera</i>	Moringaceae	The leaves have about as much as potassium as a banana and about the same amount of vitamin C as an orange. It also has calcium, protein, iron and amino acids, which help your body heal and build muscle. It's traditionally been used as a remedy for diabetes, inflammation, bacterial, viral and fungal infections, joint pain, heart health and cancer.	
8	Little wild guard	Karchi kai , Kasarakaya, Luffa tuberosa	<i>Momordica cymbalaria</i>	Cucurbitaceae	It is an abundant source of fiber, vitamin C, beta carotene, calcium and iron content. It possess medicinal properties such as hepatoprotective, anti-diarrhoeal, nephroprotective, antidiabetic, antimicrobial and anti-allergic activity.	
9	Safflower leaves	Kusubipallya	<i>Carthamus tinctorius</i>	Asteraceae	Safflower contains limonene, which is a powerful antioxidant that can help to prevent cancer. Safflower contains iron, manganese, magnesium and vitamin B-3. Iron is important for red blood cell production while manganese helps to build healthy bones. Magnesium helps with a large number of the body's enzymatic reactions. vitamin B-3 can help with cholesterol levels and reduce the risk of cardiovascular disease.	

10	Chickpea leaves	Kadalepallya	<i>Cicer arietinum</i>	Fabaceae	Chickpea leaves show great promise as a dietary source of several human essential minerals, the consumption of chickpea leaves should provide a number of vitamins and health-promoting phytochemicals such as folate, phyloquinone (vitamin K), ascorbate (vitamin C), β -carotene (a source of vitamin A) and other carotenoids (which can serve as antioxidants)	
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Table 2. Marketing of underutilized vegetables

N=70

Sl. No	Underutilized vegetables	Marketing			
		Sold directly to consumer		Sold to Processing/ cooperatives/ Middlemen	
		F	%	F	%
1	Pigweed	49	70.00	21	30.00
2	Joyweeds	30	42.86	40	57.14
3	Basale	41	58.57	29	41.43
4	Nela Basale	45	64.29	25	35.71
5	Brahmi	48	68.57	22	31.43
6	Pointed Gourd	20	28.57	50	71.43
7	Moringa leaves	60	85.71	10	14.29
8	Little wild guard	51	72.86	19	27.14
9	Safflower leaves	42	60.00	28	40.00
10	Chickpea leaves	18	25.71	52	74.29

The results presented in table 2 revealed the marketing pattern of underutilized vegetables in the Kalyana Karnataka. The data indicates two channels of market were utilized by the farmers in selling the underutilized vegetables in the study area are directly selling to consumer and selling through middlemen.

The underutilized vegetables like moringa leaves (85.71%), little wild gourd (72.86%), pigweed (70.00%), brahmi (68.57%) and nela basale (64.29%) are primarily marketed directly to consumers. This trend suggests that these vegetables have a high local demand, perishable or preferred fresh, allowing farmers to sell directly without relying on intermediaries. This form of direct marketing likely ensures better profit margins for the producers.

Whereas, Joyweeds (57.14%), Pointed Gourd (71.43%), and Chickpea leaves (74.29%) show a higher

dependence on middlemen, cooperatives or processing units. This indicates either the lack of direct market access or a crop that requires some form of post-harvest processing or storage, pushing farmers to opt for indirect channels. While, basale and safflower leaves show a balanced marketing trend, with 58.57 and 60 per cent, respectively, being sold directly to consumers, and the remaining portions handled by intermediaries. This may reflect flexibility in market options or moderate perishability. Hence there is need for strengthening direct market access, support for value addition, market linkage and awareness and infrastructure development like improved transportation, cold storage, and small-scale processing units could support both direct and cooperative-based marketing models.

Table 3 Constraints in utilizing the underutilized vegetables

N=70

Sl. No.	Constraints	F	%
1	Lack of Knowledge regarding health benefits of underutilized vegetables	65	92.86
2	Lack of formal seed supply system	54	77.14
3	Non availability of Govt. assistance and research support	40	57.14
4	Limited market linkages and commercialization	66	94.29
5	High perishability and poor post-harvest management	45	64.29
6	Erosion of Traditional Knowledge	60	85.71
7	Changing Food Preferences and Social Stigma	65	92.86
8	Lack of Technical Guidance	60	85.71
9	Lack of improved varieties and planting material.	40	57.14

From the data presented in the Table 3 reveals that, the most frequently cited constraint was limited market linkages and commercialization (94.29%), indicating that farmers face significant challenges in accessing structured markets and value chains for these crops. Without reliable buyers or price assurance, there is little motivation for farmers to cultivate such vegetables on a larger scale. While, lack of knowledge regarding the health benefits of underutilized vegetables and changing food preferences and social stigma each expressed by 92.86 per cent of respondents. These findings suggest a dual challenge of consumer unawareness and cultural shifts away from traditional foods, which collectively reduce demand. Many younger or urban populations may view these vegetables as "poor man's food," leading to a decline in both cultivation and consumption.

With respect to the constraints erosion of traditional knowledge and lack of technical guidance was express by 85.71 per cent of the farmers. These factors reflect absence of structured agricultural extension services

related to these crops. As knowledge and techniques are not being passed on or formally documented, their cultivation becomes increasingly difficult. Another significant constraint is the lack of a formal seed supply system (77.14%), which makes it difficult for farmers to access quality planting materials. This is further exacerbated by the lack of improved varieties and planting material (57.14%), which limits productivity and disease resistance, discouraging adoption.

Additionally, high perishability and poor post-harvest management (64.29%) emerged as a logistical barrier. These vegetables, often harvested fresh, require quick handling and infrastructure like cold storage, which is often unavailable in rural areas. Lastly, non-availability of government assistance and research support (57.14%) highlights a policy gap. The absence of targeted schemes, subsidies, or institutional research means that underutilized vegetables remain excluded from mainstream agricultural development programs.

Table 4 Suggestions as expressed by the farmers to increase the utilization of underutilized vegetables

N=70

Sl. No	Suggestions	F	%
1	Government has to establish the formal seed supply system	62	88.57
2	Developing market linkages and infrastructure	66	94.29
3	Public awareness campaigns and promotional programmes has to be organized	69	98.57
4	Established post harvest management and value addition centers	39	55.71
5	Strengthening technical support system to provide in time required technical guidance	64	91.43
6	Frequent training programmes should be organized on cultivation and marketing of underutilized vegetables	32	45.71
7	Research institutes should bring high yielding varieties of underutilized vegetables	51	72.86
8	Different dishes should be introduced to increase consumption of underutilized vegetables	35	50.00

The results indicate that, the most widely supported suggestion, indicated by 98.57% of respondents, was the need for public awareness campaigns and promotional programmes. This shows that farmers recognize the importance of increasing consumer demand by educating the public on the nutritional, medicinal, and ecological benefits of these crops. Awareness is seen as the first step toward changing attitudes and increasing market demand.

Closely following, 94.29 per cent of farmers recommended developing market linkages and infrastructure. This reflects their concern over poor access to buyers, lack of transportation and storage facilities, and absence of organized markets. Stronger market systems would not only ensure better prices but also reduce post-harvest losses and encourage more widespread cultivation.

Another key suggestion, supported by 91.43 per cent, was to strengthen the technical support system. Farmers clearly see the value in having regular, reliable, and accessible guidance on cultivation practices, pest management, and post-harvest handling, which are often missing for these lesser-known crops.

About 88.57 per cent of respondents stressed the need for the establishment of a formal seed supply system, as many underutilized vegetables lack standardized or commercially available seeds. The absence of quality seeds limits scalability and productivity, which can be addressed through government intervention or public-private seed initiatives.

A considerable number of respondents (72.86%) also suggested that research institutions should develop high-yielding varieties of these vegetables. Improved varieties can lead to better disease resistance, higher yields, and enhanced shelf-life, which are critical to making these crops economically viable for farmers.

Suggestions related to post-harvest management and value addition (55.71%) and culinary promotion through new dishes (50.00%) show that farmers are aware of the consumer side of the value chain. They recognize that storage, processing, and innovative food products can extend shelf life and increase consumer appeal, especially in urban areas.

However, only 45.71% of respondents emphasized the need for frequent training programmes, which may indicate a lack of time, confidence in effectiveness, or prior negative experiences. Despite this, regular capacity-building activities remain essential to keep farmers informed about best practices and innovations.

IV. CONCLUSION

Underutilized vegetables of the Kalyana Karnataka region represent an invaluable reservoir of biodiversity, nutrition and livelihood opportunities. Rich in vitamins, minerals, and medicinal properties, these crops can play a significant role in addressing malnutrition, improving dietary diversity, and promoting sustainable agriculture. However, their potential remains largely untapped due to limited awareness, inadequate seed supply systems, and lack of market linkages. Strengthening farmer training, promoting value addition, improving marketing channels, and integrating these crops into government nutrition programs can enhance their cultivation and consumption. By preserving and popularizing these traditional vegetables, Kalyana Karnataka can not only safeguard its agro-biodiversity but also ensure food and nutritional security for present and future generations.

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