Current Status and Constraints Encountered in The Cultivation of Underutilised Fruit Crops in India

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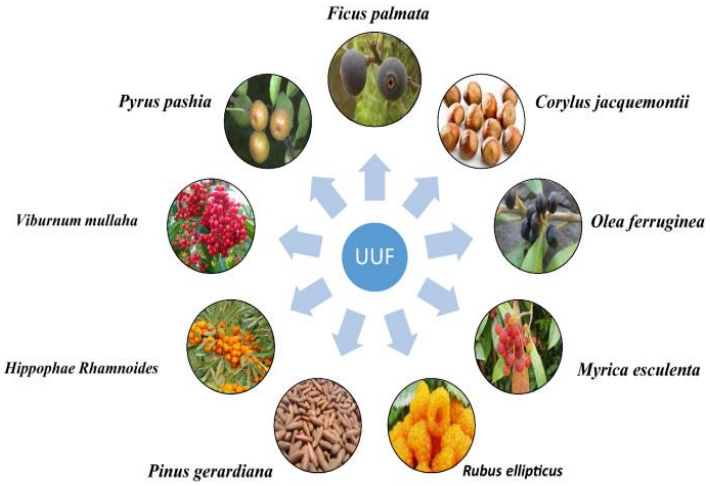
India holds a significant position on the global fruit cultivation map due to its diverse weather and climatic conditions, which favour the growth of various fruit varieties. Despite the abundance of these fruits, there is limited room for lesser-known fruit crops to expand, even though they offer high nutritional value in terms of nutrients, vitamins, and minerals. These less recognized crops, also known as underutilized crops, play a crucial role in providing livelihoods for economically disadvantaged individuals. Underutilized crops are plant species that receive minimal attention in marketing and research but exhibit strong adaptation to marginal and stressful conditions. Underutilized fruits can be described as those that are less accessible, utilized to a lesser extent, or rarely consumed, particularly in specific regions. In semi-arid areas, we encounter the oldest fruit tree crops, which have broad distribution and demonstrate adaptability to a wide range of soil and climatic conditions across India. In emerging economies and low-to-middle-income countries, it is vital to pay attention to every plant and its different parts to promote a varied and nutritious diet and address deficiencies in micronutrients, known as "Hidden hunger". Without acknowledging the value of each product, they remain underutilized. Many overlooked and underutilized species are rich in nutrients and well-suited to low-input agriculture. The decline of these species can have immediate impacts on the nutritional status and food security of impoverished communities.

Underutilised fruit crops in India:

Underutilised plant species are those which have characteristics beneficial to human activities but are not extensively cultivated or researched. These crops typically have specific traits that make them suitable for certain regions or environments rather than being widely distributed. Unlike mainstream crops that are grown on a large scale, underutilized crops are often cultivated in smaller quantities.



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Despite their potential advantages, underutilized crops tend to receive less attention from researchers, farmers, and government officials. However, they often possess remarkable nutritional, therapeutic, and medicinal properties. For example, some underutilized crops may contain high levels of essential nutrients or exhibit medicinal properties that can be beneficial for human health. Integrating underutilized crops into agricultural practices offers several potential benefits. Firstly, it can contribute to increasing agricultural production by diversifying the range of crops grown. This diversification helps reduce dependence on a limited number of staple crops and enhances resilience against pests, diseases, and environmental changes. Additionally, cultivating underutilized crops can promote sustainable farming practices by utilizing resources more efficiently and preserving biodiversity.

Moreover, incorporating underutilized crops into agricultural systems can have positive social and economic impacts. It can provide alternative sources of income for farmers, particularly in regions where mainstream crop cultivation may be less viable. Furthermore, by promoting the consumption of diverse and nutritious foods, it can contribute to improving public health and nutrition outcomes. Recognizing the value of underutilized crops and integrating them into agricultural systems can have

wide-ranging benefits, including enhancing food security, promoting biodiversity, supporting sustainable farming practices, and improving human health and livelihoods. Therefore, efforts to research, conserve, and promote the cultivation of underutilized crops are essential for realizing their full potential in addressing global food and nutrition challenges. Main underutilised crops in India are: Aonla/Amalaki/Amla (*Emblica officinalis*), Ber/Indian Jujube (*Zyziphus mauritiana*), Fig (*Ficus carica*), Karonda (*Carissa carandas*), Dragon fruit, Star fruit, Blueberry, wild fruits etc.

Importance and limitations of underutilised crops

Underutilized crops possess distinct characteristics that make them deeply ingrained in local cultures, often forming an essential part of traditional culinary practices. Their adaptability to diverse climatic conditions and resilience against various stressors, both biological and environmental, underline their significance. Typically, these crops require minimal inputs and management efforts, yet they offer a wealth of essential nutrients and medicinal properties, flourishing even in marginal or neglected lands with little intervention. Furthermore, they play a vital role in post-harvest applications, contributing to the creation of diverse food products like pickles, jams, and jellies, thus adding value to agricultural outputs.

Moreover, the potential of underutilized crops extends beyond their immediate nutritional and cultural value. They hold promise in addressing broader challenges such as food and nutrition security, mitigating risks associated with market disruptions and climate variability, and promoting sustainable ecosystem functions. By diversifying agricultural production and utilizing marginal lands effectively, these crops offer avenues for enhancing resilience in food systems.

However, despite their inherent advantages, underutilized crops face a range of barriers to widespread adoption and utilization. These challenges include limited knowledge about their production and nutritional qualities, inadequate awareness of their economic potential, and insufficient infrastructure for processing and marketing. Additionally, the absence of supportive policies and investment further hampers their development and utilization.

Addressing these barriers requires concerted efforts from various stakeholders, including researchers, policymakers, farmers, and extension workers. Investments in research and development, as well as targeted interventions to improve awareness and infrastructure, are crucial steps towards unlocking the full potential of underutilized crops. By overcoming these challenges, underutilized crops can emerge as valuable assets in fostering resilient and sustainable food systems, contributing to broader efforts in achieving food security and promoting agricultural sustainability.

Current status of underutilised fruit crops in India

Over the past thirty years, there has been a notable surge in research endeavours dedicated to underutilized crops. While many of these research projects have been driven by the interests of individual researchers, significant programs have also emerged with the specific goal of promoting underutilized species within agricultural systems. These initiatives seek to highlight these crops as viable alternatives or potential sources of novel products, and they have been implemented in both developing and developed countries alike. This indicates a global recognition of the importance of diversifying agricultural practices to enhance food security.

Moreover, there is a growing acknowledgment of the necessity to consistently advocate for the cultivation and utilization of underutilized crops as a means to bolster food security worldwide. This recognition stems from an understanding of the potential benefits these crops offer, including their resilience in diverse environmental conditions, their nutritional value, and their potential to provide alternative sources of income for farmers. A seminal report authored by Williams and Haq in 2002 provided a comprehensive overview of ongoing research efforts and proposed initiatives aimed at fostering collaboration on underutilized crops. This report not only underscored the breadth and depth of research interests surrounding these crops but also emphasized the importance of enhanced cooperation

to unlock their full potential. By facilitating collaboration, sharing knowledge and resources, and promoting best practices, such initiatives have the capacity to significantly advance the utilization of underutilized crops in addressing global food security challenges.

Conclusion

Underutilized crops, previously extensively cultivated, are now witnessing a gradual decline in both cultivation area and production. This diminishing trend poses risks to various aspects including agronomic, genetic, economic, and cultural factors. These crops garner lesser attention from both farmers and consumers compared to more prominent crop species grown in the same agricultural setting. The overall reduction in the cultivation of underutilized crops may result in a depletion of genetic diversity, constraining the potential for utilizing distinct traits in crop enhancement and adaptation. Introducing novel fruit sources could integrate these underutilized and disregarded plants into mainstream consumption patterns.

To tackle these challenges, immediate development of technologies is imperative to mitigate losses during post-harvest handling and to facilitate specific processing purposes, product development, and storage of fresh and processed items. This paper aims to offer comprehensive insights into the background, policies, international initiatives, current research, constraints for sustainable production, research methodologies, and potential strategies and action plans for the strategic advancement of underutilized crops. It is anticipated that these insights will steer efforts towards sustainable food and nutrition security and poverty alleviation.

In summary, recognizing the significance and potential of underutilized crops in India can significantly contribute to agricultural and rural development while reducing food and nutrition inadequacies. By leveraging the unique attributes of these crops and implementing strategic approaches, the challenges associated with underutilized crops can be effectively tackled, laying the groundwork for a more sustainable and resilient agricultural sector.

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