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23. MARKETING AVENUES OF MINOR FRUITS

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Underutilized fruit provide fruit, nutrition and substances to the native communities and are additional source of income. Though the wild and domesticated diversity is composed of nearly 3000 tropical fruit species, only few have been cultivated on large scale (Yietmeyer, 1990). The main reason of being underutilized is lack of awareness of their potential and non availability of planting material of varieties, and low and erratic bearing habit of these fruit crops (Arkeoll and Clement, 1989). An exact definition of minor fruit crops is perhaps difficult. In a general sense, those fruits which though are consumable to the human beings but relatively less palatable than other fruits, which have lesser demand in the market, which are grown to a limited extent only and are not usually cropped in organized plantations with application of inputs are considered in grouping as minor fruit crops. Other terms that are used for these fruits are less-known fruits, less appealing fruits, less-exploited fruits, stray fruits, wild fruits etc. However, any sharp line of distinction between the major, i.e., principal or more acceptable fruits and the lesser known or minor fruits finds limitation if attempted to be done on a global basis. For example, mango is unhesitatingly ranked as the most important fruit in India while it is regarded as a minor fruit crop only in some western countries. There has been concern in recent years regarding the efficiency of marketing of fruits and vegetables, and that this is leading to high and fluctuating consumer prices and only a small share of the consumer rupee reaching to the farmers.

Minor fruit in other word called underutilized fruit is presently gaining importance worldwide due its high nutraceutical properties which provide health related benefits and improve our body defence system. The Minor fruits have many advantages in terms of easier to grow, hardy in nature, can be grown in poor, marginal and problematic soils and can produce good yield even under extreme weather conditions. There are many minor fruit crops which are less known to the common people about its nutritional and medicinal values. Globally about 600 tropical and subtropical fruit species are known to occur in their areas of genetic diversity. Amongst different diversity areas, Southeast Asia is represented by more than 500 species of fruits while the Hindustan region of diversity represents 344 species of fruits having vast potential needs to be exploited. Indian sub-continent holds vast genetic diversity of several tropical and sub-tropical underutilized and underexploited fruits. Many of these species are being used by local people as minor fruits as well as for various medicinal purposes. Several of these fruits still remain neglected and grow in wild naturally or semi-wild conditions providing livelihood and nutritional support to small and marginal farmers, and tribes and children of those areas (Singh *et al.*, 2017). Most of these fruits are directly harvested from trees or shrubs growing wild or semi-wild in forests, marginal forest lands and homestead gardens by local people. Bulk of this produce is used by the family/community itself and in case of surplus, sold in the local markets with small commercial gains to local inhabitants. However, changing dietary patterns amongst the new generations particularly the fruit rich in nutrition and health promoting bioactive compounds are increasing, so this opportunity needs to be grabbed for commercialization of these minor fruit crops. Underutilized fruits provide food, fuel, fodder, nutrition, and substances to the native communities and are an additional source of income (). Many fruit species have not yet been utilized to full potential in spite of their economic and therapeutic values. These fruit plants are cultivated locally or commonly cultivated but new uses yet to be identified. Broadly these fruits can be categorized in to four groups.

1. Cultivated locally but still they are underutilized
2. Cultivated commonly, but new uses yet to be identified

3. Cultivated in country or region, but their values are known to else wherre in similar climatic condition.
4. Grow and harvest wildly.

Minor fruits

Minor fruits/underutilized fruit species like khirmi (*Manilkara hexanda*) fulfil the vitamin A requirement of tribal women and children in the tribal dominated districts of Gujarat, Madhya Pradesh, Rajasthan and Maharashtra. Similarly, aonla (*Embllica officinalis*), bael (*Aegle marmelos*), chironji (*Buchanania lanzan*), karonda (*Carissa congesta*), ker (*Capparis decidua*), phalsa (*Grewia subinaequalis*), pilu (*Salvadora oleoides*), jamun (*Syzygium cuminii*), kokam (*Garcina indica*), malabar tamarind (*G. cambogia*), tamarind (*Tamarindus indica*), ber (*Ziziphus mauritiana*), lasoda (*Cordia dichotoma*), wood apple (*Feronia limonia*), custard apple (*Annona squamosa*), *Annona reticulata* (Ramphal), *Annona muricata* (Soursop), fig (*Ficus carica*), phalsa (*Grewia subinaequalis*), mulberry (*Morus nigra*), *Artocrapus lakoocha* (Monkey Jack), *Eriobotrya japonica* (Loquat), *Dillenia indica* (Chalta) manila tamarind (*Pithecellobium dulce*), timru (*Diospyrus melenoxylon*), *Phoenix sylvestris* (Date sugar palm, Tadi), *Diopyrus species*, mahua (*Madhuca indica*), palmyra palm (*Borassus flabellifer*) etc. have tremendous nutritional value and form the small but special part of diet of local inhabitants. These future new generation crops are awaiting their popularization and full utilization as they remain only as plants of local importance (Singh *et al.*, 2007, Singh *et al.*, 2010a&b, Singh *et al.*, 2013 and Singh *et al.*, 2017).

Marketing Systems

Marketing of horticultural crops is complex especially because of perishability, seasonality and bulkiness. The spectrum of prices from producer to consumer, which is an outcome of demand and supply of transactions between various intermediaries at different levels in the marketing system, is also unique for minor fruits. Moreover, the marketing arrangements at different stages also play an important role in price levels at various stages *viz.*, from farm gate to the ultimate user. These features make the marketing system of minor fruits to differ from other agricultural commodities, particularly in providing time, form and space utilities. While the market infrastructure is better developed for food grains whereas fruits and vegetables markets are not that well developed and markets are congested and unhygienic (Sharan, 1998). The markets in many of the major cities in some states are not covered by market legislation and continue to function under civic body as well as private ownership. Some studies have shown that producers' share in consumers' rupee is comparatively lower for perishable crops (Saikia, 1985, Singh, 1985). This could be due to a variety of factors such as number of intermediaries, cost of various market functions rendered by intermediaries, spread of location of the producers and consumers. Further the degree of perishability, variety and quality, and various market imperfections, market infrastructure etc. also influence the marketing costs and price levels. Producers' share was found to be relatively high in areas where better infrastructure facilities for marketing were made available. Some studies have cited examples of an improvement in producers' share over a period of time due to improvement in market infrastructure, such as cold storage facilities. Producers' share was also often varies during peak and lean seasons (Subbanarasaiah, 1991). Substantial variation in producers' share in consumers' rupee for fruits and vegetables was also observed even in the same location itself (Garg and Misra, 1976). In many locations for fresh fruits, regulated markets are the first destination. Growers send their produce daily to these markets for sale and traders and retailers buy from them for the consumers. Fruits and vegetables arrive from far off places follow different marketing systems. It was also found that the regulated markets benefited farmers in proportion to the effectiveness with which market committees supervise the trading of fruits marketing. These findings advocate effective implementation of regulatory measures, improved market infrastructure, and dissemination of market information that could not only improve the marketing of fruits and vegetables but also the share of producers' in consumers' rupee.

Agricultural marketing continued to be plagued by many market imperfections such as inadequate infrastructure, lack of scientific grading system, defective weighing instrument and so on. The basic objective of regulating the marketing of agricultural products was to bring both producer and buyer/trader closer and to the same level of advantage. This would help in reducing the involvement of middlemen and associated costs and margins. Moreover regulated markets are the platform for both producers and buyers to represent their grievances and discuss matters of mutual interest. Market legislation in India covers almost all agricultural commodities. Since regulation of markets is a state subject, the regulatory measures adopted by various states differ though marginally. There are as many as 4000 regulated markets in the country dealing with fruits and vegetables trade. While the market regulation has been successful in some areas to certain extent, it has not often achieved the objectives to the desired level. A large number of wholesale markets are yet to be brought under the purview of market legislation. Regulating markets are only the first step to improve the marketing efficiency. Past studies on regulated markets in various parts of the country brought out various inadequacies in the system in terms of their functioning, infrastructure, price realized by farmers and so on. Grading, providing price information at different markets etc. have been neglected by few regulated markets. Few other problems identified are lack of standardised price quotations, disparities in rate of market fees. In some cases, it was found that the traders and not the farmers obtained the benefit of the regulated markets. In few regulated markets, there are very few traders and hence enough healthy competition is not there and eventually low prices are realised by the farmers. In markets, produce remained only for a few hours in the market significant mechanical damage and contamination can occur in the course of loading, unloading and handling (Sharan, 1998). All these evidences suggest that there is large scope for improving various aspects of fruits particularly marketing of minor fruits in the country.

There is an urgent need to realize socio-economic value of these fruits in view of their nutritional, cultural, religious and economic values for the local communities and adaptive capabilities of plants to changing climate. Most of these minor fruit species are providing ecosystem sustainability being fully adapted to harsh and stressed arid and semi-arid and arid fragile habitats, the most vulnerable to the climate change scenario. It is, therefore, advocated to encourage participation of farmers and tribal communities in the conservation effort of these fruits by supporting and providing them good planting material, training them in better cultivation practices, motivating communities to protect and use their own plant species, facilitating marketing options and empowering them with available public support systems. If properly utilized, these underutilized fruits have potential as a source of food, fodder and fuel besides meeting multipurpose needs of local communities (Rathore, 2009 and Goyal and Sharma, 2009). In rural areas, nutritional deficiency problems can be solved by utilizing degraded and marginal land through planting of underutilized plants. The most of underutilized fruits require elaborate preparation and processing before they could be consumed. Recently, considerable interest has aroused in the production of underutilized fruits. The underutilized fruits can provide remunerative novelty foods also. The importance of these less known fruits is increasing because the people realized the significance of new useful bioactive compounds present in these fruit crops to manage various ailments, low calories, sweetness, insecticidal compounds and gamma linolenic acid. The various post harvest products of underutilized fruits are as under.

Fruits	Products
Bael	Pulp, RTS, toffee, slab, sharbat, candy, nectar, squash, syrup, jam, preserve, powder, pickle
Phalsa	Juice, RTS, squash, nectar and syrup
Jamun	Juice, RTS, squash, nectar, jam, vinegar, wine, jelly, cidar and syrup

Custard apple	Pulp, beverages, squash, wine
Wood apple	Chatuny, pickle, jelly, squash
Karonda	Preserve and candy, pickle, chutney, syrup, jelly
Kair	Salt stock and dried
Lasoda	Salt stock, pickle dried and culinary purpose
Loquat	Candy, jam, chutney, syrup, jelly
Mahua	Alcohol, bakery, vinegar, syrup, wine,
Fig	Dried,
Monkey jack	Pickle, Jelly, RTS
Mulberry	Juice , Squash, shyruop
Manila tamarind	RTS, Squash and syrup
Khirni	Dehydrated fruits, fruit bar, RTS and jam

Mishra *et al.* (2016)

Underutilized fruits are undoubtedly very impotent for nutritional security with high potential of value addition and income generation. Although, these fruits have little value as table fruit, but rich in phyto-chemicals, minerals, vitamins with high antioxidant activities which can contribute therapeutically to human health. At present, consumer awareness on health promoting herbal food supplement to manage life style diseases has been increased. With help of value added products and phyto-medicine, underutilized fruits can be commercialized through proper marketing and branding (Mishra, 2018).

Marketing costs in different marketing channels of minor fruits

Following channels for marketing of minor fruits are in practice in the local as well as in distant market (Meel *et al.*, 2018).

Local market:

I: Producer or collector -Local Fruit &Vegetable Market-Consumer

Distant Market:

II: Producer or collector -Village Trader-Commission Agent (Fruit&Vegetables Market)-Wholesaler-Retailer- Consumer

Marketing avenues in Channel I (Producer (Fruits)-Local F&V Market-Consumer)

This is the most effective method, but not possible for bulk produce. In this channel, producer directly made available his produce to the consumers. Small producers directly sell their produce in small quantity by taking produce in local F&V market, or kept a heap of produce beside road sides. About 16 % of total producers use this channel for minor fruits. Producer have 90.42% share in consumer price.

Marketing avenues in channel II (Producer-Village Traders-Commission Agent (F&V Market)-Wholesaler-Retailer-Consumer)

In this channel, village trader remained in contact with prospective or large farmers all time and raise demand for good quality produce. They collected the produce from many farmers in bulk and transports it to the distant markets like Delhi, Jaipur, Mumbai, Agra, Chandigarh etc. 60% of producers use this channel and producer have 22.72% share in consumer price due to entry of more middleman.

Market arrival and production trends:

Supply of minor fruits is very low and increase in average price is very high because demand is very high in local as well as distant market due to high nutritional and therapeutic values. Till now very less number of commercial orchards of these fruit crops is established, however farmers of Gujarat, Uttar

Pradesh, Rajasthan and Madhya Pradesh have started growing commercially like bael, jamun, custard apple. Most of the minor fruit are found growing naturally and fruits are collected by local habitants/collectors and are being sold in nominal price.

Situation Analysis of value-addition and its constraints:

Awareness of farmers about latest technology is very low. Value addition includes activities like sorting, grading, packaging and drying which is carried out to enhance the value of the produce and helps the producer to fetch remunerative value for his produce (Dheeraj *et al.*, 2008). To make producers aware about it government should organize several training programs time to time. Now days, government is organizing some training session for producers and women and advising them to start business on small scale. Institutes, NGOs are waiting for a project to come with such kind of processing facility on large scale. Traders are using the activities of value addition like grading and packaging. Highly graded fruits are mostly sent to distant markets as they fetch higher price for it. CFB carton and jute bag are being used for packaging. Some of the constraints in installing processing of these minor fruits are as follows:

- Lack of awareness about processing technology developed by research institution.
- Lack of awareness for processed products among consumers in the local market
- Lack of awareness about market price of these products.
- Marketing of processed/unprocessed products is tough job for producers.
- These crops grow naturally, so far no special cropping of these crops is in practice among farmers.

Constraints in marketing of minor fruits

Some constraints in marketing of these fruits are as follows:

- High demand in distant markets but production is scattered.
- Seasonality of the produce in small quantity.
- Lack of processing facility and knowledge about processing.
- High cost of storage to an individual because of small quantity of produce.
- Lack of Awareness about processing technology developed by research institution.
- Lack of awareness for processed products among consumers in the local market.
- Lack of awareness about market price of the products.

Present scenario of marketing of minor fruits

These are the naturally grown crops. Very slight or zero growth rate over the past few years due to unawareness of farmer about latest technology developed by research institution. On these crops, area should be increased to enhance production by organizing training, conducting FLD through KVK and research institution on farmer's field. Some small farmers/collectors prefer the marketing channel which involve middleman *i.e.* as it escape them from marketing hassles and also enable them to transfer all kind of risks associated with marketing of the produce. Margins earned by market retailer are highest in this channel. In case of marketing of through producer's share in consumer's rupee is highest in channel without intermediaries.

Traders added the value to the produce by doing grading and packaging not by the farmers. Lack of awareness about processing technology developed by research institution, processed products among consumers in the local market, and lack of awareness about market price of these products are major obstacles for establishment/ setting up small scale processing unit.

Separate space for minor fruits in *Krishi Upaj mandi* for efficient marketing.

High demand in distant markets, Seasonality of the produce, lack of processing facility and knowledge about processing, high cost of storage to an individual because of small quantity of produce, lack of cooperative society/federation for marketing of these products are the obstacles in setting up a cold storage facility.

Recommendations

Productivity of most of the minor fruits is not up to the mark because produce is obtained from naturally grown crop; hence government should come with a plan to suggest measures of production, productivity enhancement to producers through advance technology like suitable varieties, agro-techniques, crop diversification and insect pest and disease control measures.

Producers were getting higher price in distant marketing, but still their share in consumer's rupee was lower due to high cost of transportation, higher margin of middleman, wholesaler, retailer etc. Cooperative marketing should be promoted in the area through which producers can sell their produce in distant markets at higher prices with lower cost on transportation and storage and it also help to increase their share in consumer's rupee.

Farmers use jute bag and carton for *Kachari* fruits for packaging purposes. Hence, government should promote the use of proper packaging materials such as Corrugated Fiber Cardboard boxes (CFB) and Ethylene absorbent paper by organizing training and making these items available to farmers at subsidized rates.

A sound market intelligence system should be established by the government so that information regarding price prevailing in different local and distant markets can be made available to farmers. A smoother and efficient marketing system should be established to minimize the market intermediaries to increase producer's share in consumer's rupee. Government should come up with a plan or invite the investors to establish processing facility as well as cold storage facility so that along with employment generation, farmers can be benefitted by getting remunerative price for their produce. Processing technology should be standardized to avoid wastage (Meel *et al.*, 2018).

Conclusion

The high percentage of margin to farmer-consumer price difference is indicative of large inefficiencies and relatively poor marketing efficiency of fruits. There is great need to improve the marketing of minor fruits. One important measure would be to bring more markets under regulation and supervision of a well-represented market committee. Another measure would be the promotion and perhaps enforcement of open auctions in the markets. Yet another measure could be efforts to bring more buyers and sellers into the markets, bringing them closer to perfect markets. The direct participation of farmers should be increased. Market infrastructure should be improved through storage (go-down) facilities, cold storages, loading and weighing facilities. Improvement in the road network, and cold-chain facilities are also of substantial importance. Greater transparency of the operations through supervision and systems can also help substantially. The market integration and efficiency can also be improved by making up-to-date market information available to all participants through various means, including a good market information systems, internet and good telecommunications facilities at the markets. If small and marginal farmers want to sell their produce of minor fruits direct to urban market which put three changes against them first-huge quantity, second- same quality and consistent quality and third - competitive price. Small and marginal farmers can not fulfil these conditions. The efficiency of marketing for minor fruits in India has been of significant concern in recent years. The producers and the consumers often get a poor deal and the middlemen control the market without any value addition. The producers and the consumers often get a poor deal and the middlemen control the market without any value addition. If farmers will organize under Farmers and producer organizations can break this vicious cycle of the market. Recently web based and mobile app based platforms like veggibazar.com, vegwala.com, farm2kitch, mondiaionwheels.com, harrafresh, freshdaily, veggies.co.in, vegfru, greencart.in, go4fresh.in, bigbasket.com, fruitvegetable.com, greentokri.com, etc. are coming in urban India. Such information should be made available to the producer/ farmers so that they could know the market position of produce in local as well as distant markets.

References

- Arkeoll, D. B. And Clement, C. R. (1989). Potential of new food crops from Amazon. In: New crops for food and industry (Wickens *et al.*, eds), Chapman and Hall, London, pp.150-165.
- Goyal Madhu and Sharma S. K (2009). Traditional wisdom and value addition prospectus of arid fruit of desert region of North West India”, *Indian Journal of Traditional Knowledge* pp. 581-585.
- Mishra D. S. (2018). Enhancing economics through value addion. *Indian Horticultur*, 63(5):107-109.
- Mishra, D. S., Singh, S., Singh, A.K. and Yadav, V. 2016. Future fruit crops for semi-arid conditions of western India. In: Compendium of *Exploitation of underutilized fruit crops of arid and semi arid region* (Lakhawat, S.S. ed.) held at MPUAT, Udaipur from Oct. 04-24, 2016, pp. 187-192.
- Rakesh Meel, A. K. Singh and R. K. Singh (2018). Farm Business Management and Project Appraisal. Kalyani Publishers, New Delhi, Pp.1-177.
- Rathore Mala (2009). “Nutrient content of important fruit trees from arid zone of Rajasthan”, *Journal of Horticulture and Forestry* September, 2009 pp. 103-108.
- Sanjay Singh, A. K., Singh, Bagle, B.G. and More, T. A. (2007). Scope of minor fruits under arid conditions. National Seminar on Recent Advances in Production, Protection and Post Harvest Management of Grape, Mandarin and Arid Fruits held at KNK, College of Horticulture, Mandasaur, M.P., Pp. 76-78
- Singh Dheeraj, Wangshu Wobsang, Prahalad V.C. (2008). “Processing and Marketing feasibility of underutilized Fruit species of Rajasthan” Paper presented at IAMO Forum 2008.
- Singh, A. K., Sanjay Singh and Lata, K. (2013). Exploitation of underutilized crops in precision Horticulture. In: *Precision Farming in Horticulture* (Eds. Dr. Jitendra Singh), New India Publishing Agency, Pitam Pura, New Delhi pp. 173-184.
- Singh, A. K., Singh, S., and Singh, R. S. (2011). Popularization and marketing of bael in western India. SPJS and National conference on Hoti Business-linking farmers with market, 28th -31st May, 2011, held at Dehradun. pp.103.
- Singh, R. S. Singh, A. K., Singh, Sanjay and Vikas Yadav (2017). Underutilized fruits of hot arid Region. In: *Biodiversity in Horticultural Crops*, Vol. 6 (Ed. K. V. Peter), Daya Publishing House, New Delhi, pp.75-92.
- Singh, Sanjay and Singh, A. K. (2011). Improvement in underutilized fruit crops rich in bioactive compounds and their economic cultivation. Compendium of winter School on Bio-technological approaches for the enhanced production of nutraceuticals in fruit and vegetables of arid Zone, CIAH, Bikaner, pp. 157-162.
- Singh, Sanjay and Singh, A. K. (2014). Production technology of underutilized fruits. In *compendium of winter School on High tech intervention in fruit production for enhancing productivity, nutritional quality and value Addition* held at CIAH, Bikaner from 5th to 25th November, pp.133--136.

- Singh, Sanjay, Singh, A. K., Sisodia, P. S., Joshi, H. K., Bagle, B. G. and More, T. A. (2010). Potential and prospects of underutilized fruits for nutritional and economic upliftment. National symposium on conservation Horticulture, 21-23 March, 2010, Organized by G.B. Pant Univ. Agri. & Tech. Pant Nagr, Uttarakhand, Pp. 222-23.
- Singh, Sanjay, Singh, A. K., Mishra, D. S. and Appa Rao, V. V. (2017). Nutritional security for rural population of semi-arid farmers through underutilized fruits. In: Compendium of Winter School on Doubling Income through Advance Approaches for Fruits and Vegetable in the Arid Region held at CIAH, Bikaner from 18 Oct to 17 Nov, 2017, pp.53-63.
- Singh, Sanjay, Singh, A. K. and Lata, K. (2010). Exploitation of underexploited crops in precision farming. Proc. National Seminar on Precision Farming in Horticulture, 28th and 29th December, at College of Horticulture and Forestry, PMUAT, Udaipur, Rajasthan, Pp. 26-33
- Vietmeyer, N. (1990). The New crops Era: Advances in New Crops (Jules Janick and J. E. Simon, Eds.). Proceedings of First National Symposium:- Research, Development, Economics. Indiannapolis, Oct. 1998, Timber press Portland Oregon New Crops, pp.23-26