



Gender in Arid Horticulture and Future Thrusts

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Introduction

There are several challenges for food processing industry of India in modern time. Quality control, skilled man power, unexploited mechanization of the industry, development of production, grading, storage, transport, packaging and export supply chain are a few to name. Women the age old custodian of knowledge and work experience of food processors are facing extra challenges of being taken out of the enterprise owing to lack of modern skills, entry of men with increasing demand of industry and economy, apart from continuing age old socio cultural limitations of women. This paper analyzes how women can be empowered to face all these challenges apart from maintaining their socio cultural dignity.

Women and Horticulture

Held back by societal pressures over the centuries until really the most recent, and still oppressed in many cultures, women have had little opportunity to excel in most fields, including horticulture. A few, however, do stand out in a field dominated by men.

One of the first of note was Jane Wells Loudon, born Jane Webb (1807-1858). A writer of poetry and books for children, her first significant work. *The Mummy*, took a look at the civilization of the 22nd century, complete with steam-powered ploughs and air conditioning. This was written in 1827. She spent the rest of her career visiting gardens and writing 19 books on gardening, natural history, and botany. She was one of the first, at this beginning of the Victorian period, to write books for women on gardening. They had such titles as *Gardening for Ladies* (1827) and the *Ladies Companion to the Flower Garden* (1841). In these, Loudon wrote to an audience with little or no knowledge of science and practical gardening, beginning with the basics of botany as then known, in lay terms. Following in this Victorian period is a well-known female horticulturist, and the person considered as having the most influence on 20th century gardening in the U.S. and England. Gertrude Jekyll (1843-1932) began her training as an artist. With failing eyesight in her forties, she turned to gardening and photography, creating as a result an impressionistic style of garden. In the past decade or so, perhaps concurrently with the renewed interest in herbaceous perennials and borders, she has regained popularity. Although she didn't invent the herbaceous border, she perfected it much as we see in gardens today. Her influence is seen on many famous subsequent landscape designers and their gardens. She collaborated with the famous English architect Edwin Lutyens, as well as the famous landscape designer and publisher William Robinson. Her writings also have regained popularity, and some have been reissued. She wrote ten books including *Wood and Garden*, *Home and Garden*, and *Colour in the Garden*. In addition to these books, she edited the weekly magazine, *The Garden*, and wrote more than 1,000 articles for various magazines. Meanwhile, in America, the first woman botanist of note was Jane Colden. By the time she was only 34 years old, in 1758, she had described over 400 plants using the "new" Linnaean methods. Although the Victorian period saw an increasing number of women authors in this country, as well as in England, the next noteworthy woman of American horticulture was perhaps Beatrix Jones Farrand (1872-1959). A landscape architect and admirer of Jekyll, Farrand was a consultant and designer of over 200 projects. Being from an established New York family, many of her projects stemmed from her connections. They included gardens for the Rockefellers, the Morgans, The White House, and the New York Botanical Garden, and universities such as Yale and Princeton. She was a founding member of the American Society of Landscape Architects, and the first woman charter member, elected at an age of only twenty seven.

Quality Norms and Food Processing

The horticultural activities must be in confirmation to climate especially in arid zone. Choice of fruit crop for arid areas is very important and requires very careful effort for obtaining successful bumper yields. Rainfall regime in these areas is very short therefore fruit crops which have their maximal growth period during the maximum availability (i.e. between July to February) period in the soil and low vapor pressure in the atmosphere are suitable, viz. ber, pomegranate, guava, and custard apple can be successfully grown. Fruit crops having deep root system, synchronized leaf shedding mechanism, wax coating on leaves, etc. are an additional benefits, which helps in reducing extreme transpiration losses. Hardy fruit crops, which can endure water stress such as Ber, Aonla, Pomegranate, Guava, Bael etc. are some of the fruits suitable for cultivation and preservation (Tewari et.al.2004).

Sanitary and Phytosanitary (SPS) measures are increasingly playing a key role in world trade. Developing countries are finding themselves confronted with problems arising from constantly changing standards in the developed world and poor flow of information. The standards formulated by the Codex Alimentarius Commission for specific food items are taken as the base. In case of disputes in global trade, Codex standards are referred. However, the importing country reserves the right to fix their standards higher and more stringent than the Codex norms and reject imports provided they are scientifically justified.

This situation has placed the developed countries at an advantage. They have the technology to fix higher standards. There has not been adequate transfer of technology and know-how to the developing countries to fix such equally higher

standards. Besides, the developed countries are constantly changing their standards and there is a poor flow of information in the developing countries. There is, therefore, every possibility that the stringent SPS measures may at times be used politically to deter imports from developing countries.

SPS norms are no doubt necessary to protect the health, hygiene and environment of citizens. But it should not be used as a political weapon. There is a debate whether we can have common SPS norms for specific food products all over the world on purely scientific basis so that the trade will not be hindered. While some advocate common SPS norms for specific products, others argue that as agro-climatic conditions, culture, food habits and ethics differ from region to region, countries should be left to fix their own norms, which should not be below the basic standards fixed by Codex.

It is time now that the expert bodies set up jointly by Codex, WHO, WTO and FAO work in perfect coordination on respective mandated issues. There should be active involvement of other inter-governmental organizations like Global Environment Monitoring System/Food Monitoring and Assessment Programme (GEMS/Food). GEMS/Food has in its possession valuable data relating to trends of contamination in food, their contribution to total human exposure and significance with regard to public health and trade. Involvement of the inter-governmental organization which takes care of quarantine measures in animals, the Office International des Epizooties (OIE) and the International Plant Protection Convention which has a mandate for devising quarantine measures for plants, is absolutely necessary for this gigantic task. The WTO's Sanitary and Phytosanitary Committee should also be involved in the process as its involvement would ensure that trade will not be affected by any irrational norms.

Government agencies and scientific institutions spread all over the globe should help with relevant data and research in formulation of acceptable SPS norms. Here the developed bloc, in particular, consisting of the European Union, US, Japan and Canada should entertain a rational view and help Codex in formulation of norms which would be not only scientific but also practical for implementation by the developing countries. They should also be generous in transferring adequate technology to the developed world for upgradation of standards. Codex, WHO and FAO should also take up the job of scrutinizing the rationality of stringent norms in developed countries. Large variations in Sanitary and Phytosanitary norms in the developed world for specific food products have placed the exporters in the developing countries in a difficult situation.

Necessities of Fruit Preservation

Besides eating raw fruit are valued for their preservation quality as they can be made into jams, jellies, pickles, marmalades and stewed and fermented products. There are several conventional and modern techniques available for preservation.

- (1) **Year round availability of different raw materials** - Beginning from pomegranate in December, the Ber can be preserved until March along with Bael. Aonla season also coincides with it. During April and May vegetables can be taken for preservation e.g. Ker, Gunda and Sangri are available in summers. Green mango can also be taken up for preservation. Drying of seasonal vegetables can be taken up during seasons of some of the vegetables.
- (2) **Availability of technical support group** - A strong technical back up unit is required for successful operations of the food preservation activity. This unit will be responsible for multistage quality control, procedural checkups and quality of preservatives and their recommended quantities, storage under hygienic condition etc.
- (3) **Availability of tools for preservations** – As the export of preserved food undergoes strict quality checks, the tools available for processing should be of international quality. There would be many difficulties in sale of products if they are not made hygienically.
- (4) **Safe packaging** – Recently packaging has attained high standards in International markets owing to requirements of keeping the products safe for consumption for a long time. Possible time loss in transport, rough handling during transport and fire and rain incidences during transport has demanded high standard of safe packaging. This has to be followed at all levels to compete in trade of food preservation.
- (5) **Marketing of finished products** - Marketing aspect needs to be strengthened for year round sale of the preserved fruits and vegetables. Distribution of profits should be decided before the initiation of activity, there can be two simple ways, that members can be paid lump sum daily wages for their work, secondly on the basis of sale 10-20 % profit is kept for the cooperative and rest is equally distributed in the members. Once the activity is carried out regularly, more women may be enrolled as members. Each member should be given some incentive for making active members.

Accelerating Participation of Women for National Development

The need for imparting training to women in planning and administration as also provision of technical skills to women engaged in agriculture if carried out in right earnest, the country would rise by two percentage points in GDP alone. More representation of professional women in the boards of companies and a need to look at entrepreneurship beyond the traditional sense will improve national economy beyond doubt. Women must take to mentoring other women which should become part of the ecosystem. Women suffer from poor asset ownership and fare poorly on the awareness levels of their legal rights. Even the one's who are aware, do not demand their rights vociferously. Providing flexi-time to women by their employers is necessary as it has been observed that women between the ages of 30-45 drop out of employment because of family responsibilities and because of the fact that this age group represents the reproductive years of their life. The role employers could play in accelerating women entrepreneurship could be achieved by the three-pronged approach. These are commitment from the top leadership; establishment of an entrepreneurship framework encompassing supply chain, community and advocacy; and execution which includes promoting women-owned business in the supply chain and connecting such entrepreneurs with businesses opportunities. A vision is required at creating an enabling environment for women enterprise development through policy reforms; build institutional capacity for women enterprise development through training, advisory services and business networks and develop tools and appropriate solutions for women entrepreneurs. The challenges faced by women entrepreneurs highlight the nature of the ecosystem in which they operate. Women primarily face challenges that are socio-cultural as well as institutional in nature. This may be in contrast to regional differences to overcome gender and socio-cultural challenges.

Transformational changes are required in empowering women by providing them with economic tools and access to resources, greater voice, confidence and independence to lead their lives as successful entrepreneurs. The way forward is to track and measure women entrepreneurship, their contribution to economy, employment and growth. Knowledge support in areas such as finance, technology, procurement and legal matters to create a unified code for credit application and processing of loans, creating an online supplier development portal will provide a single point of access to help women entrepreneurs with access to tools for estimating farm-specific technology requirements, offer self-assessment to identify training needs and estimate their cost, create a state, regional and/or national network of strong women business owners who can serve as role models, and engage participation by high-profile organizers who can rise to the cause.

The opportunity to exercise flexible working hours for married women and non removal of women employees after they have children, should be a norm for any employer. Imparting skill-based training to women for inclusive growth rather than being sympathetic to them is the need of time. Investing in women is just not ethics but it is a sound economics. The agriculture sector has the highest concentration of unskilled women labourers who account for 70 to 80 per cent of the total workforce. Women own less than five per cent of the property in the agricultural sector. Think about the profits that could be achieved in agricultural exports if products are actually developed to help women increase their productivity.

Ms. Lalitha Kumaramangalam, Chairperson, National Commission for Women states that "Empowerment is not merely economic empowerment or financial inclusion. Women are not yet skilled enough to become totally a part of development movement. The influence of patriarchal society in making women drop out of work, is more often about 'women vs women' than 'men vs women'. Men are not always at fault. It is often women keeping other women down too,"

Current Status of Food Industry in India and its future Prospects

India produces all kinds of fruits and vegetables, its annual production touches 81.30 MT for fruits and 162.20 MT for vegetables, and is the second largest country in farm production in the world but unfortunately post harvest processing is extremely poor(2-4.6) in comparison to countries like USA(65%),China(23%) and Philippines(78%). These countries are far ahead in reducing wastage and enhancing the value addition and shelf life promotion of farm products. Rajasthan state though produces comparatively less to other stats of India , but can improve its processing income not by improving production but by simply minimizing on losses.(Table 1)

Table1:Current and projected scenario of fruits and vegetables processing in India and Rajasthan- 2014(MT)

Produce	Production	Current Losses	Domestic consumption and Export	Current Processing	Minimum Losses be Processed	Total Projected Processing
India						
Fruits	81.30	24.30	55.40	1.60	20.30	21.90
Vegetables	162.20	48.60	110.40	3.20	40.50	43.70
Rajasthan						
Fruits	0.70	0.20	0.03	0.02	0.16	0.18
Vegetables	0.90	0.27	0.48	0.02	0.20	0.22

This is a very unfortunate and alarming situation for our country as large quantity of agricultural production goes into waste, not even composted. In an estimate the losses touch an annual high mark of 30-35 % amounting to a revenue loss of 500 billion INR due to poor storage and transport facilities. Vegetables are also highly susceptible to decay due to high water content and poor storage facilities. The second green revolution talked about in the country will not come from revolution in higher production but it will come from secondary agriculture , processing and export. As more than 60% of our population is engaged in agriculture the processing sector has to be strengthened along with production to sustain livelihoods of farmers. If processing sector is strengthened in India the demand for agriculture and labour will automatically increase as it is an extension of agriculture sector. The food processing industry is of paramount importance in times to come as effective linkages are underway between economy, industry and agriculture. The linking of these three sectors will certainly promote growth in India. The processing industry is not only dependent on fruits and vegetables alone but a variety of foods like grains, pulses, milk and milk products, meat and poultry, fish and other marine products and various beverages form a very large part of the industry. Small cottage industries form a large

number of units in the processing sector, each contributing processing of approximately 250 tonne per annum. Ready to serve beverages, fruit pulps and juices, dehydrated fruits and vegetables, pickles, savoury products, frozen fruits etc; form a large part of the business. Very fortunately these units are generating export markets elsewhere in the world. It is expected that by 2025 an increase of 35% will be recorded in their sales world over. The food processing sector is therefore looked as a rising sun in trade and business in India, FDI is also expected to increase in this sector. This sector is very important for overall growth of India. A large section of population will find an employment in this sector mainly due to two factors, A. growth in domestic country demand for processed food due to vast changes in lifestyles and employment of women outside homes and B generation of awareness in small farmers towards potential of agriculture sector for export orientation of business. Another domestic demand may be generated in near future for cut and clean vegetables, ready to cook due to employment of women outside homes. India will see a paradigm shift in food and agriculture sector in near future. Let us examine our traditional strength in this sector.

Traditional Food Processing Strength of India and its Exploitation for Trade Development

Our country is traditionally rich in its culinary practices owing to abundance of variety food availability and preservation of its rich culture by women folk of India. India is probably the only country which has kitchen in every household and cooking is performed two to three times a day. We need to strengthen this very feature of our culture by supporting through research and development in this area. The nurturing of this culture and heritage through out length and breath of the country will give Indian food processing industry an intellectual favour through out world. Our products will be liked by people in other countries which will give us a business boom. This will be a kind of brand Indian quality food. Many spices and herbs which are native to India will add specific characteristic flavor to food that can't be copied.(Table2).

Table2: Food and medicinally important nutraceuticals, spices and herbs of India

Name	Food Use	Medicinal Value
Aniseed	Tea, pickles	Heat stroke
Asafoetida	Curries, pickles	Digestive problems
Bay Leaf	Rice, curries, garam masala	Flavour and digestive properties
Betel Leaf	Paan	Digestive
Black Cardamom	garam masala, biryani	Anti oxidants
Cardamom	After meal delicacy, tea	Cooling effect
Chironji	Sweets	Essential oils
Chilli	Curries, pickles	Anti bacterial
Cinnamon	Sauce, beverage	Anti oxidant
Cloves	Curries, garam masala	Digestive
Curry Leaf	Salty dishes	Essential oil and flavour
Fenugreek	Curries, pickles	Digestive, Anti diabetic
Garlic	Curries, pickles	Heart regulation
Ginger	Tea, curries	Used in winters
Mace	Sweets, pulao	Anti bacterial
Mustard seed	Pickles, snacks	Anti diabetic
Nutmeg	Sweets, curries	Children digestion
Pepper	Tea, curries, pulao	Stimulants
Pomegranate Seed	Dhals	Anti oxidant
Poppy Seed	Dhals, meat	Rich Protein
Saffron	Rice, Sweets	Used for coolness
Tamarind	Curries, Chutney	Digestive
Turmeric	Pickles, Curries	Antiseptic

Their exploration in value addition to different vegetables and fruits and simultaneously harvesting on their medicinal value will not only increase economic returns for the country but will also generate employment for poor classes. Value addition in India therefore is timely need in post harvest processing of fruits and vegetables. Women are the custodian of indigenous knowledge therefore their role in times to come will become more important.

Formation of women Self help groups

As stated earlier women are the backbone of agriculture, emancipation of their knowledge base increases the return rapidly, accurately and timely, in skills relating to food preservation. Women are specific target group for such type of activity because they can while staying at home do these works with more precision. As women are more involved in

food processing, it will be easier for women to master the skill of preservation quickly. Formation of self help groups can lead to successful implementation of work.

Conclusion

Women the age old custodian of knowledge and work experience of food processors are facing extra challenges of being taken out of the enterprise owing to lack of modern skills, entry of men with increasing demand of industry and economy, apart from continuing age old socio cultural limitations of women. Held back by societal pressures over the centuries until really the most recent, and still oppressed in many cultures, women have had little opportunity to excel in most fields, including horticulture. Jane Wells Loudon, Gertrude Jekyll, Edwin Lutyens, Jane Colden and Beatrix Jones Farrand are few English women who laid history of gardening, landscaping and horticulture. The horticultural activities must be in confirmation to climate especially in arid zone, Sanitary and Phytosanitary (SPS) measures are increasingly playing a key role in world trade. Developing countries are finding themselves confronted with problems arising from constantly changing standards in the developed world and poor flow of information. The standards formulated by the Codex Alimentarius Commission for specific food items are taken as the base. In case of disputes in global trade, Codex standards are referred. Government agencies and scientific institutions spread all over the globe should help with relevant data and research in formulation of acceptable SPS norms. Besides eating raw fruit are valued for their preservation quality as they can be made into jams, jellies, pickles, marmalades and stewed and fermented products. The need for imparting training to women in planning and administration as also provision of technical skills to women engaged in agriculture if carried out in right earnest, the country would rise by two percentage points in GDP alone. More representation of professional women in the boards of companies and a need to look at entrepreneurship beyond the traditional sense will improve national economy beyond doubt. Women must take to mentoring other women which should become part of the ecosystem. Women suffer from poor asset ownership and fare poorly on the awareness levels of their legal rights. Transformational changes are required in empowering women by providing them with economic tools and access to resources, greater voice, confidence and independence to lead their lives as successful entrepreneurs. India produces all kinds of fruits and vegetables, its annual production touches 81.30 MT for fruits and 162.20 MT for vegetables, and is the second largest country in farm production in the world but unfortunately post harvest processing is extremely poor(2-4.6) in comparison to countries like USA(65%),China(23%) and Philippines(78%). Our country is traditionally rich in its culinary practices owing to abundance of variety food availability and preservation of its rich culture by women folk of India. India will see a paradigm shift in food and agriculture sector in near future.

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