

Value addition of locally adapted underutilized crops

Neetu Sharma¹, Vishal Dogra² and Deep Kumar³

Krishi Vigyan Kendra, Kangra (Himachal Pradesh) 176 001

There are several lesser-known plant species in Himachal Pradesh which have tremendous potential to be converted into value-added products. Krishi Vigyan Kendra (KVK), Kangra, Himachal Pradesh successfully introduced value addition and processing technologies w.r.t. underutilized fruits/vegetables among rural women of the district. Self-help Group of village Dhoran led by Ms Shabnam, with their perseverance, determination and technical advice from KVK is successfully running a processing unit on underutilized fruits/vegetables. At present her self-help group is producing nearly 30-35 q of value-added products from under-utilized fruits/vegetables. The processing venture has provided a dietary supplement as well as commercial opportunity to the rural community.

Key words: Crops, Under-utilized crops

HIMACHAL Pradesh is a treasure house of traditional, locally adapted indigenous food crops, which are mostly underexploited. As many as 3,295 species (7.32%) out of a total 45,000 plant species are found in Himachal Pradesh, India. Several fruit and vegetable producing plants are found growing in uncultivated and wastelands called wild plants. There are many plant species having significant food value or industrial potential which remain underutilized due to lack of a coherent strategy for enhancing their productivity and appropriate utilization. These are well-known species including minor crops, underutilized species, neglected species or orphan crops, underexploited, underdeveloped species, abandoned, new, lost, under used, local, traditional, forgotten, alternative, niche and promising species.

The produce of these plants is, therefore, available free of cost except for the collection. These are the real natural and chemical-free organic products having a very high food and nutritive value. They are accepted as

being rich in vitamins, minerals and dietary fiber and therefore form an essential ingredient of a healthy diet. Apart from nutritive, therapeutic and medicinal values, quite a few of these underutilized fruits have excellent flavour and very attractive colour as well. Most of these minor/ neglected food resources are available in plenty during a particular season but are not utilized due to consumer ignorance about their fruits, their mode of usage, mode of storage and ripening. Thus people residing in such areas can get advantage from these abundantly available resources by processing such perishable under-utilized commodities. Processing of fruits and vegetables into more useful and convenient products, ultimately improve the economic values of any product, which is the most vital component of value addition that not only alleviates the post-harvest losses to some extent but also results in better returns during the glut season. Besides under-utilized crops, help in extending the consumption period, converting perishable fruits in to durable form and the possibility of diversification to range of products

suiting to consumers' preference. Thus to provide exposure to the rural women Krishi Vigyan Kendra, Kangra, Himachal Pradesh took initiative to train rural women to develop them as entrepreneurs of fruit/vegetable processing sector with special reference to value addition of underutilized fruits/vegetables. Training courses were organized by the Krishi Vigyan Kendra for women Self-help Groups on preparation of various value-added products viz. pickles, jams, squashes, and preserves.

- Training on processing and marketing
- Initiative to start the venture
- Technological know how
- Market linkage
- Exposure to other processing units

Interventions of KVK, Kangra

Enhanced capacity of the farm-women organized under Self-help Groups was built through on-campus training in Krishi Vigyan Kendra on good practices in product making, maintaining product quality, packaging, and marketing. The SHGs were provided hand-holding support



Processing unit of value-added products



Value-added products prepared by the group

during initial period of product development and its standardization in quality, hygiene, packaging and marketing as well as building market linkages.

After receiving the training from KVK scientist, pioneer in this field Ms Shabnam from village Dhoran, District Kangra, Himachal Pradesh, established a home-scale processing unit of underutilized fruits/vegetables alongwith her group members. Initially the group members used to collect the wild fruits/vegetables collectively, later they started procuring from other farm-women and Self-help Groups as well as

unemployed youth of the village, thus provided employment opportunities to other people also.

Process and production

Traditionally these under-utilized fruit species are consumed as fresh fruit directly or after some processing. The products thus prepared are not usually shelf-stable for a long period and are consumed just after preparation. Secondly owing to there being perishable the possibility of their being marketed as fresh fruits is meagre. Thus the training content taught by the Kendra helped these women to

understand the fact that if these fruits/vegetables are processed into various value-added products, they will ultimately support rural economy through added income from the value addition activities. The KVK, Kangra helped these women members to identify the unutilized fruits/vegetables of the area having an income generation potential. Various fruits/vegetables namely *Carissa carandas*, *Aegle marmelos*, *Emblica officinalis*, *Mangifera indica*, *Cordia dichotoma*, *Bauhinia variegata*, *Diplazium esculentum*, *Bambusa arundinacea*, and *Citrus pseudolimon* were utilized to prepare value-added products (Table 1).

Lungru (*Diplazium esculentum*), a fiddle head fern is unique by its appearance, taste, and nutrition profile. Locals collect *lungru* from their natural habitat and are not cultivated commercially. Rich in anti-oxidant, good source of vitamins A, C and minerals, this plant is traditionally consumed only as a vegetable. Another fruit i.e. *Lasora* in its unripe form is consumed as a vegetable while ripe *lasura* is not a commonly sold fruit, most likely because of its difficulty to transport and its high perishability. *Kachnar* (*Bauhinia variegata*) also belongs to the category of underutilized vegetables and is well known for its therapeutic and nutritive values. Thus to harness the potential of such fruits/vegetables these were converted into pickles by the women.

After attaining the training, the group made their first move with

Table 1. Processed value added products of underutilized plants prepared by the group members

Fruits/Vegetables Botanical/Local name (Family)	Products	Quantity produced/ prepared (2014-15)
<i>Carissa carandas</i> L. (Karonda) *Apocynaceae	Pickle	1-2 quintals
<i>Aegle marmelos</i> (L) Correa Rutaceae (Bael, Bel)*	Squash Preserve	30 lt 70 kg
<i>Emblica officinalis</i> Gaertn. (Aonla, Amla)*Euphorbiaceae	Chutney Pickle <i>Triphala</i> powder	1-2 q 2-3 q 3 q
<i>Mangifera indica</i> L. (Aam) *Anacardiaceae	Pickle Chutney Dried mango powder Fruit leather	3 q 2 q 60-70 kg 20 kg
<i>Cordia dichotoma</i> L. (Lasora, Laseda) *Boraginaceae	Pickle	50 kg
<i>Bauhinia variegata</i> L. (Karalen, Kachnar) *Caesalpiniaceae	Pickle	40 kg
<i>Diplazium esculentum</i> (Retz.) Sw. (Lungru) *Athyriaceae	Pickle	80 kg
<i>Bambusa arundinacea</i> (Retz.) Willd. (Baans) *Gramineae	Pickle	40-50 kg
<i>Citrus pseudolimon</i> Tanaka (Galgol) *Rutaceae	Pickle	80-90 kg



On-campus training at KVK

preparation of pickles only with an initial investment of ₹ 4,000/-. The processed product was sold for ₹ 5,325/-. With this first success and a sense of achievement, they got motivated and decided to expand the business by addition of more products. Thus with technical advice received from KVK and regular follow up with the scientist, today the group is producing nearly 30 to 35 quintals of value added products from underutilized fruits/vegetables. The products prepared are pickles, *chutneys*, squashes, dried powders, fruit leather, *triphala* powder (a mixture of *harad-Terminalia chebula*, *gonla-Emblica officinalis*, and *Bahera-Terminalia bellirica*) etc.

Marketing and linkages developed

Marketing was started from their own village that has now extended to local fairs, festivals, exhibitions and markets. The SHG also market their produce through a shopping counter while local buyers directly come to their homes to purchase the product. The group leader, regularly participates in exhibition, fairs, field days, meetings which provide visibility to products and recognition to efforts of SHG as an entrepreneur. Role of scientists of KVK, Kangra has been critical in motivating her

and providing mentorship for her value addition enterprise based on underutilized crops. The SHG manages enterprise effortlessly with effective linkages developed with government/private agencies for bulk orders, individual farmers for raw material availability, research institute for innovative technology and local women for seasonal help.

Economic gains and impact

- Profit generated by the activity wavers between ₹ 10,000 and ₹ 20,000 /woman.
- Besides value addition generated additional employment in the village, value-added the spare time of the farm-women and enhanced their social status and self-esteem.
- There was an increased appreciation from family members, friends and relatives, recognition from officials, self-satisfaction, freedom from financial insecurity fears and ability to take up new enterprises.

UTILITY OF THE ACTIVITY

Consumption of under-utilized fruits/vegetables crops in any form can be an affordable means of achieving nutrient sufficiency as they are rich source of carbohydrates, fats, proteins, energy, vitamins A, B₁, B₂, B₃, B₆, B₉, B₁₂, C, folic acid, and minerals, Ca, P, Fe, and dietary fiber. Thus, they have the nutritional capacity to prevent and cure various diseases like kwashiorkor, marasmus, nightblindness, anaemia, diabetes, cancer, hypertension, and hidden hunger.

Source of nutrients

The mineral profile of *Bauhinia variegata* and *Cordia dichotoma* also revealed that both these plants are rich in various macro-and micro-minerals, thus can be utilized as such or in form of various value-added products as good sources of minerals.



Value-added Products for sale

Source of income

The underutilized crops have the potential to give economic security to the local natives by giving employment and by fetching good returns from their sale in the form of value-added products. Women of the area are preparing pickles and other processed products and selling them in local markets to get money for their household needs.

SUMMARY

The result concludes the advantages offered by the underutilized and neglected crops in enhancing the nutritional security of local communities and enhancing their income through this value addition venture. The unique strength of certain underutilized and neglected crops in their rich and favourable nutritional composition and product development offers uncommon opportunities for income generation to the farmers, in particular the farm-women.

¹SMS (Home Science), ²Programme Co-ordinator, and ³SMS (Agronomy), Corresponding authors' e mail: neepradu@gmail.com



Plant trees,
Conserve water,
Protect environment.

