

Enhancing livelihood and profitability index of Malihabad farmers through diversified horti-enterprise modules

Maneesh Mishra*

ICAR-Central Institute for Subtropical Horticulture, Rehmankhura, Lucknow, Uttar Pradesh 226 101

Keywords: CISH harvester, Dashehari mango, GAP, Mango

Location and selection of area

The project was initiated by adopting 60 farm families in 3 villages (Mithenagar, Mohammad Nagar Talukedari, Nabi Panah) in Malihabad block of Lucknow district, Uttar Pradesh. Malihabad region of the Uttar Pradesh is acclaimed for world famous Dashehari mango which is grown over 28000 ha of land. The specific climate and soil conditions of Malihabad, with extremely hot and rainless summers, helps in developing premium quality Dashehari fruit, which are of better quality compared with other regions. Malihabadi Dashehari variety of mango has been conferred with Geographical Indication (No. 125) by India's Geographical Indication Registry which is testimony of its distinct quality. However, this distinction given to Dashehari has not helped farmers from this region so far owing to lack of awareness and diminishing profits from mango.

Number of farm families

Totally 240 mango growing farm families were selected. Of which, 120 farmers were randomly selected from three villages of Malihabad block, Lucknow where pre and post harvest GAPs demonstrated and market linkages developed. Another 120 farmers who followed traditional production and marketing practices were selected as control.

OBJECTIVE

To enhance profitability of mango farmers through adoption of GAP and linking them to market.

Horticulture based module

Intervention: Good quality and safe fruits can be produced in sustainable way by adopting GAP principles during pre harvest and post harvest practices. Therefore, adoption of GAP during on-farm production and post-production processes and marketing of produce directly to consumers will help farmers fetch high prices of produce and consumers will also get quality fruits. Good agricultural practices such as safe and judicious use of pesticides, safe harvesting through CISH mango harvester, washing, safe ripening, packaging in CFB boxes, safe transportation and direct marketing of mangoes from the farmers to consumers were the major interventions made in order to address the problems stated earlier. The intervention was demonstrated from 2017–19 at farmers field. The GAP steps included spraying of recommended pesticides 4 times in a production season, harvesting of fruits by improved CISH-harvester, shorting, grading and washing of fruits and packing in single layer CFB boxes inscribed with GI, label regarding date of harvest grade, name of farmer, phone number, latitude and longitude of orchard. Direct marketing of mangoes to the consumers and distant marketing through marketing company and Government agencies such as Mandi Parishad, Uttar Pradesh were the interventions with respect to marketing of the produce.

Rationale of the intervention: The problems faced by the farmers of Malihabad region of the Uttar

Pradesh was elicited with the help of PRA (Participatory Rural Appraisal) techniques. Pesticide spray accounts for major share of production cost of mango in Malihabad region. Farmers were not aware about right dose and right pesticide, therefore they were not able to control pest and diseases even after 7–8 numbers of sprays. Harvesting and post-harvest losses were draining away the result of hard work of all stakeholders of fruit industry. Mango growers of the region harvested fruits by shaking of branches and by locally made hook attached on wooden stick. Due to this about 10% of fruits cracked during harvesting and were unfit for marketing. Mango fruits were ripened by acetylene gas produced by calcium carbide kept in the box during packaging of fruits which is banned chemical and also harmful to human health.

Outcome

Judicious use of pesticides for reduced cost of production: The number of pesticide sprays were reduced to four in GAP adopted orchards compared to 7 sprays in conventional management practices. Farmers which adopted this technology incurred lower expenditure of ₹ 9928 per acre as compared to those who didn't adopt the technology (control) and spent around ₹ 14408 per acre.

Performance of different harvesting methods: Mango, particularly Dashehari variety is vulnerable to post-harvest losses because it is ripened at onset of monsoon and is mainly used for table purpose. The use of improved harvesting



Judicious spraying and harvesting using improved CISH harvester.

implement developed by ICAR-CISH, Lucknow resulted in significant reduction of the harvesting cost (₹ 61.5 per 100 kg mango) as against all other methods of harvesting and the same was highest for harvesting with Local Jala device (₹ 82.5 per 100 kg mango). Though the cost of harvesting by shaking the tree was less (₹ 52.5 per 100 kg of mango), the loss associated was very high. Use of improved CISH harvester not only reduced the harvest cost but also resulted in reduction of drudgery of labour. The drudgery index for various methods of harvesting was the lowest for CISH harvester (40.66) and was highest for local jala method of harvesting (66.66).

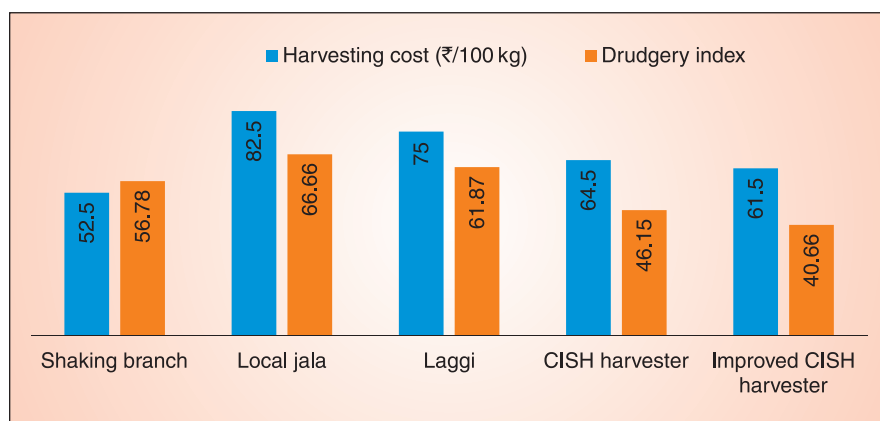
Fruit loss reduction after implementation of GAP: These losses were minimized by using improved CISH mango harvester by the FFP farmers. The damaged fruits reduced significantly with the use of CISH-Harvester (1.6%) which was as high as 26.4% by harvesting the fruit

through shaking of branches. Our study revealed that 8.44–9.45% post-harvest losses took place in Dashehari mango due to cracking and bruising of fruits in Malihabad region. The losses were not only quantitative but also qualitative which affects the marketability of mango fruits. Fruit losses estimated were 4.69% in GAP adopted mango orchard while it was 8.94% in control farmers. Use of improved CISH-harvester minimized losses considerably because it was fitted with nylon net for collection of harvested fruits which protects fruits from cracking and bruising due to falling on the hard soil surface. Harvesting with pedicel protected fruits surface from sap injury.

Linking farmers to market for enhanced income: Dashehari mango is harvested within two weeks in Malihabad region which results in glut in the local market. Farmers usually marketed mangoes in Channel I where more number of intermediaries were involved in the marketing. Access to new and better-

paying markets for agricultural products is vital in enhancing and diversifying the livelihoods of poor subsistence or semi-subsistence farmers. Marketing linkages were established through a Community Based Organization (CBO) 'Awadh Aam Utpadak Evam Bagwani Samiti', Nabipana, Malihabad. The institute signed an MoU with this CBO for spreading FFP technological interventions. The GAP adoptee farmers sold their produce through Mango Van which carried single layer CFB boxes of 'A' grade mango from Malihabad to nearby market of Lucknow every day in the month of June (Channel 2). In another attempt, GAP adoptee farmers were linked to Mandi Parishad, Uttar Pradesh for bearing the cost of transport of their produce from Lucknow to Hyderabad. An agreement was signed between M/S NeML Pvt. Ltd., Hyderabad and Awadh Aam Utpadak Evam Bagwani Samiti', Nabipana, Malihabad for marketing of their produce (Channel 3). The number of intermediaries in Channel 1 were more and the farmers share in consumers' rupee was considerably lower than channel 2 and channel 3. The highest price per kg mango (₹ 58.4) was obtained in distant marketing (Channel 3) followed by direct marketing to local consumer (₹ 32.43) in urban area (channel 2). While, the lowest price (₹ 20) was obtained in traditional marketing channel (Channel 1).

Packaging and transportation cost (₹/acre): Under Farmer FIRST project, fruits were packed in single



Drudgery Index and Cost of Harvesting/100 kg.

Linking farmers to market for enhanced income

Traditional marketing channel followed by non GAP adopted farmers and innovative marketing channels followed by GAP adopted farmers



Linking of farmers to markets for enhanced income.

layer CFB boxes printed with geographical indication and marketed through two channels i.e. direct marketing to consumer in local urban area (Channel 2) and distant marketing to private company (Channel 3). Those farmers who adopted GAP spent more money on transport and packaging i.e. ₹ 7500 per acre as compared to those who did not adopt the technology i.e. ₹ 3903 per acre in packaging and transportation. Packaging and transportation cost in marketing Channel 2 and 3 was enhanced noticeably compared to traditional marketing channel due to investment in single layer CFB box packaging. It is evident from this study that remunerative prices for mango may be attained by good post-harvest handling, packaging, branding and exploring new markets.

Enhancement of farm income due to GAP, GI and linking with direct marketing channels: The study clearly revealed that those farmers who adopted GAP in mango and were linked with distant markets, 96.66% of them realized farm gate price of 72,000 or more from one acre mango plantation.

Profit after implementation of GAP: Total net profit realized by GAP adoptees (₹ 57406 per acre) was higher than the net profit received by the control farmers (₹ 36312 per acre). GAP adoption and market linkages led to 58% enhancement in farmer's income. Fruit quality and consumer appeal for fruits were enhanced by good harvesting and post harvest handling practices, packaging, branding and market linkages which helped in getting lucrative prices of mango fruits.

TRAINING

To enhance the knowledge and skill of the farmers, various capacity building programmes were organized under farmer FIRST Project which included 5 workshops, 20 trainings and demonstrations, 45 farmers meeting. More than 200 farmers participated and have gained the benefit out of these capacity building events.

IMPACT

There is a positive spillover effect of the potentiality of Good Agricultural Practices in the study area and it was also noticed that, farmers who received the intervention also educated the fellow farmers and relatives to adopt these technologies to enhance their income and to reduce the cost. The adoption of GAP is not only beneficial to the farmers, but also provides additional production by the way of reduction in losses and provides quality fruits to the consumers at affordable prices. Overall, there is a wide potentiality of GAP adoption which has to be further spread to the larger area to reap the highest social and economic benefits. Apart from the economic benefits, adoption of GAP also has environmental and health benefits. Reduced application of pesticides has a greater positive impact on the environment and quality of fruits which results in reduced pollution and improved health of the consumers.

DRAWBACKS AND LESSONS LEARNT

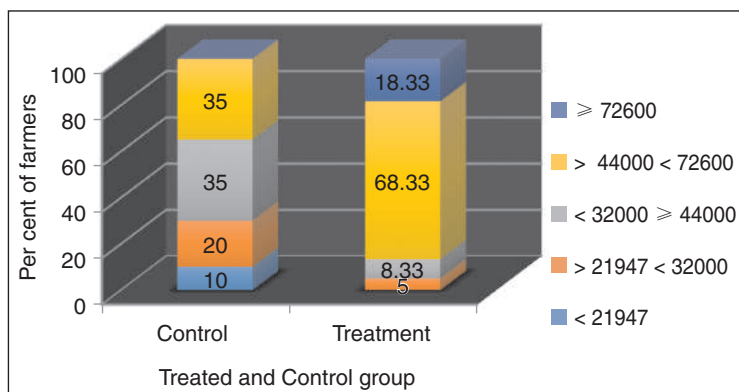
- GAP certification for dashehari mango is non-existent in the area of



Packing and marketing of mangoes using CFB box along with GI information and branding.

study.

- Adoption of GAP in mango reduced the pesticide spray thereby reducing cost of production.
- Proper method of harvesting reduced the loss of fruits.
- Packaging using the CFB box and GI indication along with the brand name helped in attracting the consumers and thus receive higher prices.
- Direct marketing enhanced the producers share in consumers' rupee.
- Ultimately the adoption of GAP reduced cost and enhanced the profitability.
- There is a need for higher investment when farmers followed GAP because of packaging (CFB box), harvesting and high transportation cost. Since majority of the farmers are small and marginal, initial support in terms of



Distribution of income across treated and control group.

subsidy or loan should be made available to the farmers.

WAY FORWARD

- There is still wider scope to avail the benefits of GI for Dashehari mango of this region.
- GAP certifying agency needs to be established.
- More focus should be given for processing and export of Dashehari mangoes.
- Establishment of processing unit at farmers' level can help them to

receive higher profits and reduce the wastage.

• More emphasis may be given to the farm women and youths for the promotion of value addition and post-harvest technology.

• Need to quantify the environmental and health benefits of GAP adoption.

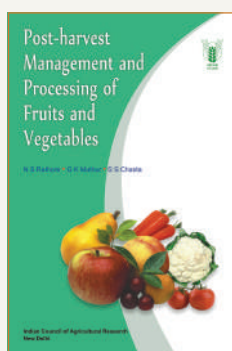
• Farmer FIRST Project may be extended

to reach out more number of farmers and more villages to be adopted.

- Need of rejuvenation of very old orchard for proper sunlight and enhanced benefits.
- Adoption of intercropping in mango orchard like turmeric, Zimikand, *Panicum* grass, Fern, etc. should be popularized.

*Corresponding author's email: maneeshmishra.cish@gmail.com

Post-harvest Management and Processing of Fruits and Vegetables



Post-harvest management technology offers promising option for increasing production of vegetables and fruits quantity-wise and also in maintaining quality of the products. It involves all the activities that occur after production or harvesting of commodities, including procurement, removal of field heat, sorting, grading, packaging, storage, transportation, primary and secondary processing and marketing of agricultural products from farm-gate to distributors. This book is an effort to document vast available knowledge on the various aspects of post-harvest management and processing, and it will prove worthy for teachers, students and extension workers for understanding post-harvest management and processing of fruits and vegetables. It has 16 chapters covering storage, packaging, advanced preservation technology and value-addition of fruits and vegetables.

TECHNICAL SPECIFICATIONS

Size	: Royal Octavo (16 cm x 24 cm)
No. of pages	: i-viii + 250
Price	: ₹ 350
Postage	: ₹ 50
Binding	: Paper Back
ISBN No.	: 978-81-7161-115-4

For obtaining copies:

Business Unit

Directorate of Knowledge Management in Agriculture
Krishi Anusandhan Bhavan-I, Pusa, New Delhi 110 012

Tel : 011-25843657, Fax 91-11-25841282; e-mail : bmicar@icar.org.in