

FIG Approach made organic kiwi fruit

venture lucrative among the tribal farmers in Manipur

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Complex, risky, low-input subsistence farming in the North-eastern hill (NEH) region is characterized by low productivity and profitability. Tribal farmer's social cohesion and aversion to chemical inputs also indicates the prospects of cluster-based organic production of high-value crops. Kiwifruit, an emerging crop in Manipur, is appropriate for organic agriculture. The Purul sub-division of Senapati district in Manipur is bestowed with all sorts of pre-requisites for successful cultivation of kiwifruit. Given this context, ICAR Research Complex for NEH region formed a successful Farmer's Interest Group (FIG) in Purul (Manipur) under Tribal Sub-Plan (TSP) to promote organic kiwifruit. The initiative formed a Farmer's Interest Group, "Senapati Producers Organization of Organic Kiwifruit (SPOOOK)" and promoted cluster-based organic production of kiwifruit in 6 tribal villages. Additionally, a partnership was formed with the state government to facilitate organic certification. The initiative was successful in improving tribal farmer's understanding for kiwifruit cultivation and significantly increasing their income.

Keywords: Farmer's interest group, Organic kiwifruit, Tribal sub-plan

NOT only increasing crop diversity leads to a larger supply of foods from a wider variety of sources, but it also gives farmers the option to sell surplus production in the market. This, as a consequence, increases the income of agricultural families. It is becoming more widely acknowledged that this tactic is an essential component of environmental sustainable agriculture and enhancing the farm profitability. In addition to crop diversification, cultivating high-value crops as a means of increasing income diversification is gaining momentum. Producers can benefit from a broader range of revenue opportunities and expanded market opportunities if they focus on high value crops. Such benefits are amplified when farmers adopt cluster or group based approach.

Kiwifruit, a high value crop, is one of the very few wild fruits which have been commercialized globally. The crop is known for its

unique taste and medicinal value. In India, the crop was first introduced to Shimla in 1963; while in North-east India large scale organized cultivation of kiwifruit was started in early 2000s in Arunachal Pradesh. In Manipur, ICAR Research Complex for NEH region initiated small scale demonstration of kiwifruit in Senapati district of Manipur under Tribal Sub-Plan (TSP) from 2012 and within a very short span of time, the crop has emerged as highly profitable in high altitude areas in the state.

However, the initial success had low visibility and the pace of expansion fell short of projections because of slow growth momentum, limited supply of quality planting material, scattered production sites and lack of awareness among the growers regarding prospects of kiwifruit, and its cultivation practices. Sale prices were difficult to stabilize because of the low volume of production. In this light,

since 2014–15, we undertook a large-scale area expansion of kiwifruit in Senapati district of Manipur through the formation of a Farmer's Interest Group (FIG) under TSP (Tribal Sub Plan) after analyzing the gaps and considering the vast scope for enhancing the farmer's income and export potential of organic kiwifruit. Eventually, we also expanded our support to include the farmers as part of a North Eastern Council (NEC)-funded project. This success story is a depiction of how the organic kiwifruit FIG programme was implemented to help tribal farmers in Manipur diversify their crop and income streams and so improve their standard of living.

Formation of farmer's interest group (FIG)

Purul Akutpa, Purul Atongba, Purul Rosofii, Thingba Khunou, Koide and Oinam Hill village under Purul sub-division in Senapati district of Manipur were selected for cluster formation. We

first established 1 Farmers Interest Group (FIG) called “Senapati producers organization of organic kiwifruit (SPOOOK)” by unifying all beneficiaries in order to transform the Purul area into organic kiwifruit production hub in the state. In total, 94 farmers from 6 villages were included. Their vision, mission and functions are listed below.

Vision: To make SPOOOK a vibrant, viable and sustainable organization and district wide network of organic kiwifruit growers.

Mission: Create and increase opportunities for growers through promotion and support to organic kiwifruit sector in Senapati district, Manipur for ensuring a sustainable future.

Functions

- To establish a sustainable farmer interest group with wide members across the Senapati district of Manipur.
- To ensure upliftment of the kiwifruit grower's community.
- To encourage area expansion under organic kiwifruit in the district.
- To facilitate organic certification and export promotion with a regional branding.
- To protect grower's right.
- To provide extension services to the members as well as other interested growers for production of organic kiwifruit.
- To update the organic kiwifruit growers on the latest technologies through farmer to farmer learning exchange between the members.
- To create awareness among all sections of consumers about the health benefits of kiwifruit to increase its popularity.
- To establish uniform value chain and regulation of sale price at farm gate for obtaining best price of the produce.
- To empower farm women and unemployed rural youths through kiwifruit processing activities.
- To maintain linkage with state and central Government Ministries/Departments for

infrastructural development, marketing etc. for organic kiwifruit.

- To strengthen alliance with ICAR, Manipur Organic Mission Agency and NABARD, etc.

Technological interventions

The major interventions were:

- Supply of disease-free quality planting material (grafted plants).
- Supply of critical agro inputs like biofertilizers, biopesticides, trellising material, etc.
- Creation of storage infrastructure.
- Bridging the knowledge gap on production technology through capacity building.

Under the programme, the plantations were managed organically. The organic production package, developed by ICAR-Manipur Centre, cover entire cultural aspects of crop production with specific focus on planting method, trellising and nutrient management. Grafted plants of kiwifruit var. Hayward as female and Allison or Toumri as male were planted on hill slope at a ratio of 1 male: 8 female plants, where every 3rd plant in alternate row was male plant. However, we also advised farmers to place the male plants in the first pit in a row face the wind direction during flowering time. The spacing of 6 m × 4 m and 6 m × 6 m under T-bar trellis and pergola system, respectively was maintained. Special attention was given on trellising of vines. Regarding nutrient application, vermicompost (10 kg) + *Azospirillum* (50 g) + *Pseudomonas* (50 g) per plant was recommended. We trained the farmers on pruning to encourage the current season growth, specifically during winter after harvesting of fruits. We also advised to irrigate the young vines at 10–15 days intervals during winter and at weekly interval during summer; however, in many areas the crop was grown as rainfed. We demonstrated mulching technique with locally available mulch material. We also trained the farmers on intercropping during first 3 years. Weed control is

important when vines are young and farmers were instructed to keep the plantation neat and clean. ICAR team periodically monitor the project sites and provided need based technical assistance to the beneficiaries as and when required. We also established one community cold room (5 MT capacity) in Purul Akutpa village for short term storage of harvested kiwifruits.

Achievements and impact

Geographic growth of kiwifruit is one of the most notable successes under TSP. Nearly 15% of Manipur's total kiwifruit area is being shared by Farmer interest group members. With an almost 90% adoption rate, the intervention had a tremendous impact on kiwifruit grower's. The cultivation process requires labour for planting, pruning, harvesting and packaging, which provided employment to local communities. Overall, when compared to other kiwifruit growers, the beneficiaries' productivity ranged from 25–35% greater on average. Being an organically produced high value crops, Kiwifruit offered a more diverse income stream for farmers and fetched good prices in the market. The farmers are realizing a net profit of ₹9–10 lakhs/ha annually. This enhancement in income helped in economic empowerment of the tribal farmers and brought a positive shift in their livelihood status. The venture was also successful in creating employment opportunities for the farm families in rural areas, where job options stimulate economic growth by increasing farmer's earning, creating rural employment and opening market opportunities.

Moreover, formation of SPOOOK, FIG served as a forum for farmers to share information, knowledge and best practices with one another. This helped farmers to stay up-to-date on the latest techniques, technologies and market trends, as well as learns from each other's experiences. This scheme not only opened a new marketing opportunity for the farmer interest group members, but they also started participating in other government initiatives. It



Glimpses of kiwifruit plantation under area expansion activity

also helped kiwifruit growers to negotiate better prices and terms for their products by acting as a collective bargaining unit. This ensured that farmer interest group members receive a fair share of the value chain. By working together, the beneficiaries strengthened

stabilization.

Under the patronage of ICAR, the members of SPOOOK, FIG organized the First Manipur Kiwifruit Festival in 2018; where the Honourable Minister of Horticulture and Soil Conservation, Govt. of Manipur graced the function as chief guest in the presence of dignitaries from District Administration, NABARD, SFAC, and other organizations. Since 2018, the State Level Kiwifruit Festival is organized by SPOOOK, FIG annually in close coordination with the ICAR-Manipur Centre. The main goals of the festival are awareness creation, brand building, bringing buyers and sellers together and promotion of organic kiwifruit. The organizer also bestows the “Best Kiwifruit Grower Award,” with a panel of judges made up of ICAR experts.

Additionally, ICAR built a strong partnership with the Department of Horticulture and Soil Conservation, Govt. of Manipur to support efforts toward organic certification. As of right now, a sizable portion of the kiwifruit area has already undergone the process of organic certification under a centrally sponsored scheme on Mission Organic Value Chain Development for North-eastern Region. Market linkage has also been made between select progressive growers and the

Manipur Organic Mission Agency.

It is worth to mention that some beneficiaries received offer from e-commerce platform for supply of kiwifruit. One progressive farmer Shri R.D. Peter also established one small-scale processing unit under the brand name “Peter’s” at Purul Akutpa village, Senapati district. The interventions under tribal sub plan (TSP) have brought substantial improvement in the livelihood of the beneficiary farmers. More farmers are turning to ICAR these days for planting material and technical advice on kiwifruit farming. The TSP initiative elevated kiwifruit to the status of one of the most promising crops in Manipur.

Hence, the farmers whose role was merely a producer has been transformed into producer cum processor, reaping greater rewards for their labour, investments, and level of risk while also producing resources for socio-economic development keeping pace with the times. Additionally, the intervention reduced the capital drain from rural to urban regions and increased employment prospects in the Purul subdivision.

SUMMARY

SPOOOK, FIG serves as a perfect illustration for the promotion of organic kiwifruit venture in high



Packaging and storage facility

their position and improved their livelihoods and well-being. Following our interventions, the Purul area in Senapati district has become Manipur’s primary kiwifruit farming zone.

The establishment of a value chain for organic kiwifruit was further aided by the introduction of suitable storage technologies in the Purul region. The storage facility is utilised by numerous kiwifruit growers on a collective basis. By lengthening the availability of fresh produces and making it available outside of the peak harvesting season, the storage facility also contributed to price

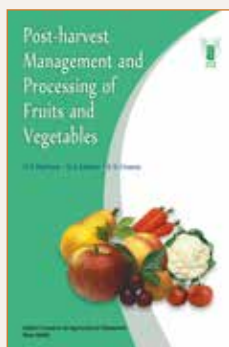


First state level kiwifruit festival

altitude areas of North-east India. The technological interventions towards holistic development of kiwifruit sector in Senapati district of Manipur made by ICAR Research Complex for North Eastern Region, Manipur Centre through SPOOK FIG has emerged as a signature success story of Tribal Sub-Plan. Organic cultivation of high value kiwifruit also helped in multiplying the farmer's income and improving their livelihood status. Their perception of market-driven, diversified farming has changed favourably as a result of the interventions. The achievement of the programme clearly indicates that promotion of high value crops through farmer's interest group should be a key strategy for widespread crop diversification and raising farmers' income in North-eastern hill region of India.

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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.

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