

Value Chain Development for Pearl millet



Rusk



Soup sticks



Sponge cake



Cheese biscuits

*Pearl millet
products*



Buns

***Harnessing Opportunities for Productivity Enhancement (HOPE) of
Sorghum and Millets in Sub-Saharan Africa and South Asia***

Value Chain Development for Pearl millet

Pearl millet is a staple food for more than 90 million people who live in the drier areas of Asia and Africa. Currently, India is the largest producer of pearl millet, both in terms of area (9.5 million hectares) and production (9.7 million tons). Pearl millet is extensively grown in the dry western and northern regions of the country in harsh and unfavourable environments, especially in the states of Rajasthan, Gujarat and Haryana. Presently, the share of pearl millet in the total production of coarse cereals in India is about 25%. In addition to food, pearl millet is also supporting livestock in terms of fodder and feed for the cattle. Millet is a rich source of nutrition especially protein, vitamins and minerals for the millions of poor people.

Value Chain

The concept of agricultural value chain includes the full range of activities and participants involved in moving agricultural products from input suppliers to farmers fields, and ultimately, to consumers. Each stakeholder in the chain has a link to the next in order to form a viable chain. Linking of farmers to the markets through efficient value chains would reduce the use of intermediaries in the chain, and strengthen the value-adding activities by better technology and inputs, upgraded infrastructure and processing and exports. This process can raise the income of farmers and will provide incentive for improving their management practices towards higher farm productivity. The income of the farmers can be enhanced by increasing production, value addition, and better marketing options.

Inputs Supply

In case of pearl millet, hybrids are dominating with high productivity. In order to ensure high productivity of pearl millet, the optimum use of critical inputs is vital. Hence, supply of critical inputs like improved seed, fertilizers and chemicals, transfer of technology through demonstration and training, seed production and management is crucial. Access to credit is also ensured through the commercial banks and cooperative societies in order to purchase cash inputs. Most of the seed companies have direct

contact with farmers in order to know the feedback of the farmers relating to the performance of their hybrids. Significant research has been done by ICRISAT in collaboration with National Agricultural system and Private companies on improved varieties that are higher yielding, more pest and disease resistant, have higher grain and forage quality, and are more drought tolerant. Currently, 82 % of the total seed supply of pearl millet and 75 % of the sorghum is by private sector companies. This has increased seed replacement rate phenomenally and productivity of pearl millet has almost doubled benefiting farmers. Thus, access to inputs and credit in association with private sector in enhancing production and productivity is crucial.

Production

Pearl millet production is best suited for the arid and semi-arid regions with its short crop life cycle, rapid grain filling, and exceptional ability to tolerate drought. Ability to grow well in marginal sandy soils without irrigation and multiple uses for the grain makes pearl millet an attractive crop. The hybrids are prominent and varieties have been disappearing. On an average, farmers allocated 1/3rd of the cultivated area under pearl millet cultivation. The production performance in the rainy season depends on distribution of rains. Under good management farmers are harvesting 9-10 quintals per acre and 2-3 tonnes of dry fodder. Out of the total production, about 50 % is marketed and another 50 % is retained for self-consumption and livestock feed.

Post-harvest

Post-harvest processing of millets is in infancy with no policy support, relegating millets. The most common complaint of small farmers in rural India is lack of access to stable markets and market led extension. Unorganized markets, asymmetric information, superfluous middlemen, little vertical co-ordination between producers, processors and consumers, meagre bargaining power, poor transportation links and lack of processing opportunities are making the millets less remunerative. Thus, improving supply chains through economies in bulking of grain, facilitation in its storage and transportation, and bulk marketing is required.

Potential for value addition: In value addition cost is added in each stage of product transformation and value is created. Value addition not only confined to processing of the raw material/product but also it involves physical changes in the product through different actors. There are many private players in India entering into the food retail chain like ITC, Reliance, Food World and so on. They are also expanding their business due to increase in income and demand in major urban centres. Urban consumers are willing to pay higher prices for high quality with known levels of food safety. Further, there are opportunities for improved efficiency in the supply chain through sorting, grading and packing in different sizes.

Potential for livestock feed

Feed: Although maize is commonly used, of late millet is also be used as poultry and livestock feed industries and this depends on relative price of maize, sorghum and millet.

One of the reasons for poor value addition in millet is the lack of processing equipment, as this requires devising innovative machinery to handle ‘small millets’. The easiest is just to pound them to which loses the property of soji, or making flakes. Devising machine and recipe are crucial for value addition. The post harvest processing, value addition, awareness, capacity building of farmers, consumers, processors, and market linkages can bridge the constraints both producers and consumers are facing in respect of meeting the millet needs.

Value added products: flour and multigrain malt

Millet based bakery products, pizzas and burgers can be prepared and this requires public private partnership. Farmers of India can supply millets to these processors who can use develop and/or use already developed value addition technology.

Value addition by physical change

Some processing techniques which can be used are as follows:

Milling: Grains are wetted, conditioned and bran is removed by an abrasive device in the

mill, which improves physical appearance and functional properties.

Puffing/Popping: The popped/puffed products have low bulk density having pleasing texture and distinct flavour. Roasted puffed grains can be used as snack after spicing whereas the powdered product can be consumed in combination with other flours and can be used to make different products like sweet and savoury products.

Flaking: Slightly premature harvested grains after partial roasting are flattened, dried, stored and usually deep fat fried before consumption as a snack. The dried millet flakes can be powdered and used as a weaning food.

Malting: Malting yields a maximum fall in the viscosity of grains that enhances the nutritional benefit, while the process of malting is used often in the formulation of low cost weaning foods.

Fermentation: Fermented gruels, dosas, idlies, etc. can be made using millet flours. The gruel can be cooked and fermented or it may be fermented and subjected to heat treatments.

Fortified products

A wide range of food products may be prepared from pearl millets grains either whole, cracked and / or raw or processed flour.

Sl. No.	Type	Food products
	Traditional products	Chapati or roti, rabbari, porridges - thick or thin, khichri, kheer, churma, bakali, suhali, shakarpara mathi, namkeen sev, matar, ladoo, popped ladoo. burfi, pakora. chat, dhokla
	Baked products	Biscuits, nan-khatai, cake, bread, walnut cake, chocolate cake, chocolate ring biscuit, chocolate muffin, sweet biscuit, coconut biscuit, sweet and salty biscuits
	Extruded products	Pasta, macroni, vermicelli and its products
	Weaning foods	Weaning mixtures with combination of pulses
	Diabetic products	Sweet and salty biscuits, chapatti mix, dhokla mix, Instant idli mix, pasta.

Value chain development and market linkage

There is a demand to use pearl millet grain in feed industries like poultry and cattle, distilleries for alcohol extraction and for bakery, nutraceuticals, health foods. This need to be harnessed with public private partnerships. Further, to stimulate demand for the value added products creating awareness and market linkage with retailers is important. Enhanced forward and backward linkages between producers and other actors in the value chain will lead to reduced transaction costs and better participation of service providers, such as input dealers, commercial and cooperative banks, private firms, and NGOs.

Fodder: Since livestock is a key complementary activity that requires more fodder. The fodder need to be processed into silage in order to enrich the nutrients. Fodder has a great demand in the markets hence it could be sold after processing to get more value.

There is a scope to sell the cleaned graded grains, value added products and the enriched fodder directly to the consumer through farmers associations in order to reduce transaction cost and earn more profits.

Some of the key reasons why millet should be a part of our healthy diet:

- Provides serotonin to calm and soothe your mood
- Helps hydrate colon and vegetable bowl movement
- Digest easily
- Millets are loaded with micronutrients like Mg, Ca, Mn, tryptophan, phosphorous, fibre, B vitamins and also acts as antioxidants are essential to our body.

Some of the nutrifacts of millets are

- Magnesium in millet helps to reduce the affects of migraines attack.
- Niacin in millet helps to lower cholesterol.
- Phosphorus in millet helps in fat metabolism, body tissue repair.
- Millet can help lower risk of diabetes and because of high fibre content reduces risk of breast cancer

About ICRISAT



The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit, non-political organization that conducts agricultural research for development in Asia and sub-Saharan Africa with a wide array of partners throughout the world. Covering 6.5 million square kilometers of land in 55 countries, the semi-arid tropics have over 2 billion people, and 644 million of these are the poorest of the poor. ICRISAT and its partners help empower these poor people to overcome poverty, hunger, malnutrition and a degraded environment through better and more resilient agriculture.

ICRISAT is headquartered in Hyderabad, Andhra Pradesh, India, with two regional hubs and four country offices in sub-Saharan Africa. It belongs to the Consortium of Centers supported by the Consultative Group on International Agricultural Research (CGIAR).

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