Exploitation of Minor Millets Genetic Resources for Poverty Alleviation in India

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Agro biodiversity plays a vital role in food security, poverty reduction and management of natural resources. Changing socio-economic and climatic conditions are leading to loss of biodiversity and degradation of the ecosystem. It is pertinent to mention that of the 7000 edible species, only 30 are widely used in agriculture for fulfilling human needs. Even among these thirty, only three species i.e. rice, wheat and maize fulfil 90% of the global food needs. Therefore, there is an urgent need for widening the food basket to ensure sustainable development. Widening the food basket is possible inclusion of local grain varieties like ragi, jowar and minor millets in the Public Distribution System (PDS) and market expansion through value addition and effective supply chain management.

Expansion of food basket and constant efforts for conservation and exploitation of genetic base of minor millets must be integrated with the twin objectives of nutritional security and poverty reduction. Minor millets in particular are used as food sources mainly in arid and semiarid regions of the world, thanks to nature owing their low water requirement and in-built genetic capacity to grow and flourish in the marginal lands. Important minor millets in India are finger millet (*Eleusine coracana*), Foxtail/Italian millet (*Setaria italica*), Kodo millet (*Paspalum scrobiculatum*), Common/Proso millet (*Panicum miliaceum*), little millet (*Panicum sumatrense*), Barnyard/ Sawa millet (*Echinochloa utilis*).

Minor millets account for less than one percent of the food grains produced in the world today. Thus they are not important in terms of the overall world food production, but they are strategic in terms of their nutritional contribution and their role in local agro-ecosystems. The protein content in these species is very close to that of wheat, but in addition they are also rich in B-vitamins, especially niacin, B6 and calcium, iron, potassium, magnesium and zinc. Minor millets do not contain gluten, therefore not suited for bread making. But due to absence of gluten, these are appropriate food for those with coelic disease or other forms of allergies or wheat intolerance.

Minor millets are extensively cultivated in tribal and hilly areas but have not received adequate attention for their varietal improvement. These millets continue to be a part of subsistence agriculture. These have a common feature of being capable of growing in very marginal sloppy fields without any input and are invariably grown under rainfed conditions. In the rainfed areas which form 65% of the total arable land in the country, millets continued to sustain the farming families. Today the millets contribute to incredible 44% of the total food grain produced in the country. More than 2/3rd of the country's livestock live in the millet region.

Most of the millet fields are inherently biodiverse. The recent analysis of millets in farming system has come to amazing conclusion that millet farming saves nearly six million litres of water per acre, a bonanza litres of water starved times we are living in. Since much of millet farming is ecological and can grow even in difficult fallow land strips, it generates a unique phenomenon called 'uncultivated foods' which shore up the food and nutritional security for the poor. They are the ultimate crop which stands up in the present crisis of climate change.

The consumption pattern for minor millets varies from region to region. In southern Karnataka, 100% of the rural population and 94% of the urban population consume finger millet as a traditional food called 'mudde' or 'thick porridge', which is especially good for children, sick and old persons. Germinated finger millet is used to make weaning food for infants. Finger millets can be used for the preparation of popped products in India. Some rural and tribal population of south India consume foxtail millet. Kodo millet is an important food crop for vast sections of the tribal community in central India. The people in Himalayan foothills use millet as a cereal, in soups and for making dense, whole grain bread called 'chapatti'. In Darjeeling hills and Sikkim 'kodo ko jaaur' is the most common fermented alcoholic beverage prepared from dry seeds of finger millet. In Ladakh region 'Chhang' is a fermented finger millet beverage. The traditional, naturally fermented finger millet product is called 'Ambali'. The tribal people in Kumaon hills, Northern India consume weaning food containing malted foxtail millet flour and malted barnyard millet flour.

With the objectives of poverty reduction through enhanced exploitation of minor millets, following are the suggested policy measures;

- Market expansion through publicity, public awareness and niche creation
- Value addition through development of ready-to-eat products, and new products such as pasta from millets.
- Expansion of area through agronomic interventions and varietal development
- Creating and propagating the commodity based farmers' association for enhancing collective bargain and share in the supply chain.

Mostly minor millets are consumed by the economically weaker sections of the marginal land areas in the country. Can these be made available on the every day breakfast table of the middle income urban group? Yes it can be but not as a primary product, the requirements of this group are different, and moreover the larger section of the middle income society is not aware of the health benefits of the minor millets.

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