



Finger millet (*Eleusine coracana*) in Kolli Hills

Agricultural biodiversity and women's empowerment: a successful story from Kolli Hills, India

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Background and context

The Kolli Hills Agrobiodiversity Conservers' Federation (KHABCOFED) is a federation of successful entrepreneurs formally established in 2009 in Kolli Hills Taluk (Tamil Nadu, India) composed of 110 different groups and with a membership of 1,523 (985 men and 538 women). Its members are from Malayali tribal self help groups (SHG) and Farmers' clubs, nurtured by the M.S. Swaminathan Research Foundation (MSSRF), Chennai. Its efforts received also the support of Bioversity International in the framework of an IFAD-funded programme launched in 2001, which focuses on the use enhancement of underutilized species. The work of the Federation revolves around local agricultural biodiversity and, in particular, on nutritious small millets. Its members operate in Kolli Hills, South India. Its activities involve a holistic value chain approach from 'farm to fork', addressing highly interconnected aspects of conservation, cultivation, consumption and marketing of local produce. The Federation manages a portfolio of 21 diverse landraces of millets belonging to different species (finger millet, little millet, Italian millet, proso millet and kodo millet), cultivated under different cropping systems and through a wise blend of traditional and modern practices.

Millets play an important role in supporting agriculture in marginal areas which are increasingly stressed by climate change. Farmers living in rain-fed semi-arid and dry areas are in fact most vulnerable to the vagaries of monsoon and climate. Millet farming is a climate-resilient system consisting of hardy crops suited to low and erratic rainfall and soil nutrient conditions.

The promotion of small millets contributes to bio-sequestration of carbon dioxide and strengthens resilience of the production system. However changing socio-economic contexts have relegated such millet farming systems to the background.

Over the last three decades, land use changes induced by the introduction and cultivation of cash crops like cassava, coffee and pepper, expansion of roads and provision of subsidized food supplies by the state, have affected the use of these millets in Kolli Hills. Low economic profitability of millets compared to cassava, weakening of traditional seed systems, the drudgery involved in processing, and poor market opportunities have all contributed to relegating these highly nutritious and resilient millets to increasingly smaller areas.

The work of the Federation has contributed to improving the livelihoods of its members, especially women who showed active interest and participation within the research activities and training. It has also contributed to strengthening the conservation of millet diversity, making agriculture-based livelihood systems more resilient to climate change and improving access to nutritional foods. These successful efforts, which are being replicated in other states of India as well as other countries, contribute to fulfilling a number of the Aichi Biodiversity Targets, including Target 7 (sustainable management and conservation of agrobiodiversity), Target 13 (sustainable strategies for reducing genetic erosion through enhanced use of local crops) and Target 18 (leveraging traditional knowledge of indigenous and local communities and promoting greater participation of vulnerable groups, especially



Kolli Hills Natural Foods millet brand

women).

Strategies employed and key activities

Over a period of time, the Federation and its member groups have built up assets of agricultural machinery and value addition units along with a Procurement Centre, whose value is estimated at around US\$ 53,000.¹ Additionally, more than US\$ 47,230 have been accumulated by member groups as savings and US\$ 138,791 leveraged as loans since 2001, which stands as a clear testimony of the success of this collective endeavour and a proof of the strategic role that underutilized crops, like millets and associated natural resources, can play in people's livelihoods. Over a period of fifteen years (2001–2016), the cultivation, procurement, value addition, diversification and sale of products have generated a gross income of US\$ 64,398.

Establishment of village seedbanks which revitalize and promote farmer-to-farmer seed exchange, improved agronomic practices and additional income derived through millet-based livelihoods in the supply chain have resulted in on-farm millet conservation.

A blend of traditional and modern knowledge provides communities with an opportunity for adaptive capacities to cope with climate change. The so called '4C' approach (conservation, cultivation, consumption and commerce) adopted by the Federation has proved to be an effective pathway

for retaining and using millet farming systems in a rapidly changing socio-economic context. Such collective initiatives are expected to be required in many areas of India and elsewhere around the world in order to harness the adaptive capacity of local communities to deal with climate change by leveraging the potential of resilient crops and production systems.

The Federation has been investing its actions in seeds and their diversity since they are critical features of farming systems. It has developed mechanisms to manage and share diverse local genetic materials all year round through village seedbanks and seed exchange networks. These practices are now playing a strategic role for local communities, able to choose varieties to adapt to changing weather conditions and evolving markets. 'Custodian farmers'³ have been empowered to play their crucial role in supporting and managing seed networks. The Federation, with the technical backup of MSSRF, has also facilitated the establishment of hullers and pulverizers suiting different types of millets, to remove the drudgery in processing millets.

The Federation recognizes women's leadership in social and legal empowerment by creating equal platform for mobility, skills building, decision making and contribution to conservation. For instance, MSSRF organized local farm women and men, who were interested in the cultivation of millets, into self-help groups and

farmers' clubs. The self-help groups were encouraged to build collective savings from their income and lend money within the group. MSSRF facilitated training and support for 43 self-help groups and 29 farmers' clubs in the Kolli Hills, which included over 943 members (of which 420 were women). Among these, 47 groups (365 men and 247 women) are involved in the institutionalization of various operations to conserve, cultivate and market millets.

Results

Conservation through enhanced use
Land-use changes have been responsible for erosion of on-farm millet diversity. Since 2001, the Federation has promoted the collection, multiplication and distribution of 21 landraces belonging to 5 millet species as well as their associated crops through a network of 15 village seedbanks functioning across 7 Panchayats.² Between 2014 and 2016, an estimated 56 tonnes of high quality millet was produced by 759 local farm families across 45 settlements in Kolli Hills. Productivity in millets has increased by 20% and income has increased by 25% net due to improved agronomic practices such as use of farmyard manure, high quality seeds, line sowing and intercropping with cassava. Farmers with best practices in agroforestry were encouraged to ensure sustainable production and resilience.

The promotion of mixed cropping, intercropping and crop rotation has



Farmers picking millet in Kolli Hills

contributed to sustainable management of natural resources and increased access to nutritious food at the household level. At the same time, the supply chain managed by the entrepreneurial farmers has unleashed the hidden economic potential of millets, which in turn secures the long term conservation-through-use of these resources.

Over the years, the Federation has contributed to the evolution of local seed networks into 15 Village Millet Resource Centres, where members of the community are provided with access to quality seeds and relevant information (related to landraces and their conservation and access, cultivation practices, value addition and market linkages).

Technological innovation and women's empowerment

Drudgery in processing is a major limitation for use of millets. The traditional de-cortication process is a tedious physical process using a pestle and mortar, almost exclusively carried out by women. The intervention from the Federation has meant a lot, especially to women, who are now able to carry out processing with less fatigue and significant saving of time, which is now used for other activities. The Federation trained

about 1,862 women SHG members in courses dedicated to value added product development, quality standards, packaging, labeling and marketing. Training in value addition helped women enhance their skills in production of products like malt, rava,⁴ and ready-made mixes of millets that fetch additional income.

Although this work started in 1997 with the establishment of ten SHGs, it was formally institutionalized into the KHABCOFED only in 2009. The current membership stands at 48 SHGs and 62 Farmers' Clubs. The Federation facilitates better access to financial and infrastructural support from National Banks and from the District Rural Development Agency (DRDA) in Tamil Nadu. Current financial worth of collective savings and infrastructure amounts to US\$ 239,014, which is complemented by physical assets such as millet processing equipment, procurement centres, community seedbanks, threshing yards and several small and medium enterprises managed directly by member groups. The initiative successfully created the *Kolli Hills Natural Foods* brand, which is currently marketing 11 types of products (figure below).

Sustainability and replication

The Federation facilitates horizontal transfer of knowledge through periodic training, demonstrations and capacity building. Envisioning its future, the Federation aims to follow a 3-pronged strategy: increase membership through social mobilization and group formation; establish a producer company to penetrate local, regional, national and global markets; diversify livelihood activities using lessons learnt so far and applying these to other crop and animal genetic resources. Towards this milestone, MSSRF recently facilitated the formation of a Farmers' Producer Company under the Ministry of Corporate Affairs, Government of India in 2016 namely "Kolli Hill Agri-Bioresource Producer Company Limited (KHABPCoL)" with the support of the National Bank for Agriculture and Rural Development (NABARD).

The Federation enabled a participatory learning and action research platform for various groups of millet farmers who otherwise have little possibility of participating in the research and development programme. This has led to active participation, increased mobility, enhanced awareness and engagement in decision-making processes. Two women and six men who have been members of the Federation have successfully graduated to become Ward members and Panchayat leaders and are in a position to influence local decision-making processes. The Federation was also instrumental in mobilizing the establishment of a Biodiversity Management Committee (BMC) at the Block level (Administrative division of Indian Districts) in association with the State and local self-government bodies, which is likely to influence an enabling policy environment regarding conservation, sustainable use and equitable sharing of benefits arising out of agricultural biodiversity.

Scaling up and enabling policies

The role and functions of the Federation have been documented by international research organizations (such as Bioversity International) and donors who have been working closely with MSSRF in the use enhancement of minor millets. Technical reports and peer-reviewed publications have been produced to share findings, outcomes and impact from the work associated with the



Farmers showcasing Kolli Hills brand



Foxtail millet (*Setaria italica*) in Kolli Hills

Federation. The Federation has been showcasing its integrated livelihood approach (the 4C) on millets in local, national and international fora, contributing to creating an enabling policy environment for nutritious millets in India. The Food Security Act in India (2013) has made provisions for the inclusion of minor millets in the Public Distribution Systems. In that regard, the work of the Federation represents today an invaluable example of ways to further the sustainable use of these nutritious crops using a holistic and participatory value chain approach.

Notes

¹Member groups in the Federation have bought land, machines, housing and infrastructure. This value refers to the value of such infrastructure and equipment's

²An elected village council in India and its administrative territory

³Custodian farmers are identified as those 'conserver' farmers (women and men) who actively maintain, adapt and disseminate agricultural biodiversity over time and space, including the culture and institutions in which it is embedded, and the knowledge needed for its used and cultivation.

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⁴Broken millet rice



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Suggested readings

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All pictures were taken by O. King