



Kutki and kodo millet. Credit: Bioversity International/Prem Mathur

Research brief: Value chain and market potential of minor millets to strengthen climate resilience, nutrition security and incomes in India

This value chain analysis was completed by E.D. Israel Oliver King, G. Meldrum, N. Kumar, Lauridsen N., C. Manjula, S. Padulosi, M.N. Sivakumar, R. Baskar, K. Madeshwaran, and as part of the international Programme "Linking agrobiodiversity value chains, climate adaptation and nutrition: Empowering the poor to manage risk" supported by the International Fund for Agricultural Development (IFAD), the European Union (EU) and the CGIAR Research Programmes on Climate Change, Agriculture, and Food Security (CAAFS) and Agriculture for Nutrition and Health (A4NH).

Kodo millet (*Paspalum scrobiculatum*) and kutki millet (*Panicum sumatrense*), also called little millet, are small-seeded cereals and among the oldest cultivated crops in South Asia. These cereals have the ability to grow on dry and marginal lands and at the same time produce grains superior in many nutrients to paddy and wheat. Despite kodo and kutki millets' many valuable properties, their cultivation, consumption and marketing remains underdeveloped compared to other cereals in India. There are indications that consumer demand for small millets is growing in more urbanised centres like Delhi, Mumbai, Bangalore and Chennai and southern India due to a growing awareness and value of health, nutrition, going back to roots and eco-consciousness. Little is known of the current status and opportunity for marketing of small millets in Madhya Pradesh, where kodo and kutki are cultivated largely in tribal belts on marginal lands.

A value chain assessment was carried out in 2017 by Bioversity International, M.S. Swaminathan Research Foundation, and Action for Social Advancement to fill this knowledge gap and to explore current opportunities and constraints for improving marketing of small millets in the region. The research took its point of departure in the farming communities in Mandla and Dindori districts, then followed the crops to the district cities, Jabalpur, Bhopal, and beyond. The assessment was carried out using semi-structured interviews to collect information about and perceptions from stakeholders

along the millet value chain including farmers, farmer collectives, vendors, supermarkets, restaurants, consumers, and experts.

Production

According to the agricultural department in Madhya Pradesh, the area of cultivated kodo and kutki in Mandla and Dindori districts was around 60,000 ha in 2016 but it has been in decline as compared to historic levels. In the study, 30 producers in Mandla and Dindori districts were interviewed to understand perceptions and trends for millet cultivation. The majority of millet producers interviewed emphasized the strong importance of kodo (67%) and kutki (72%) to their livelihoods. The yields estimated for last years' kodo production ranged from 75-500 kg/acre (mean 252 kg/acre) and that of kutki for the same period ranged between 100-240 kg/acre (mean of 188 kg/acre). Estimated paddy yields



Kutki millet harvest in Madhya Pradesh. Credit: MSSRF/O. King



by comparison ranged from 25-1500 kg/acre (mean of 413 kg/acre). Elderly farmers reported decreasing trends (88%) for the cultivation of small millets, mainly as a result of shifting to other crops (38%) and declining rainfall (38%). The majority of younger producers also noted declining production of kodo (50%) and kutki (62%) in recent years. The major reasons noted were drought (30% kodo; 63% kutki) and pest issues (50% for both kodo and kutki). For kodo, problems with ants cutting the panicles were observed, whereas for kutki the major pest was burrowing worms. Pests were observed to first attack sesame and later spread to the millets, as these species are often intercropped. Lack of seed for kutki was mentioned as a major reason for its decline, especially for the white kutki variety (*sabhat*) that cannot withstand drought. Despite these issues, a considerable number of producers had increased production of kodo (30%) and kutki (25%) in recent years. The reasons for increasing production were increasing price and awareness of health benefits, increasing yields, and increasing family need.

Consumption

A total of 66 consumers were interviewed in six markets and commercial centres in Mandla and Dindori districts, as well as Jabalpur and Bhopal. The results showed that in the rural areas of Mandla and Dindori, kodo and kutki have a very important subsistence role for tribal communities, who prefer them equally or more than rice. They consume kodo and kutki mainly as rice and kheer (a kind of porridge). Children like the taste of millets and especially prefer the kheer recipe for its sweet taste. In Mandla town, consumers were aware of millets but showed a stronger preference for paddy rice because of its greater availability, lower price, ease of processing, and preferred taste. Consumers in the cities of Bhopal and Jabalpur were, by contrast, largely unaware of kodo and kutki millet and

consequently they did not use these crops. Interestingly, the urban consumers were aware of another small millet called moredhan (*Echinochloa colona*), which is consumed as a fasting ('bhagar') food.

Consumers overall had mostly positive associations with small millets as good, healthy and nutritious food and there was a willingness among many to increase their consumption. The rural consumers encountered in the markets were mainly accessing millets from their own production or purchasing them directly from farmers. More rarely they were purchasing them from tribal market retailers. In Mandla town, Jabalpur, and Bhopal, consumers were accessing millets (mostly moredhan) from grocery shops and retailer shops.

Value chain marketing

The bulk of farmers' millet yield is consumed domestically but for some households, small millets also contribute to income. Half the producers surveyed were selling part of their production. Farmers estimated they consume 20-60% of their millet harvest and sell the remaining amount to local retailers, the local markets (shandy), to neighbours, or to local farmer producer companies who have recently been engaged in commercialization of millets. The unprocessed millet that farmers sell on the shandy is bought by buyers from the regional market (mandi) who accumulate the grains and sell them to bigger buyers, often in neighbouring States. The value chain analysis in fact revealed

that small millets from Mandla and Dindori are largely transported to Nasik, Maharashtra where there is a major aggregation point for small millets coming from across the country. Several processing centres were found there that produce bhagar from small millets.

Some local farmer producer companies and federations in Mandla and Dindori have been working in recent years with the support of NGOs and government programmes to improve the value chain of small millets. Such initiatives have shortened the chain between farmers and bigger buyers. Farmer producer companies supported by Action for Social Advancement have engaged in aggregating grains and selling cleaned and graded grains in bulk. Other local initiatives have engaged in production of value added products of millets. One of the brands found stocked in specialized shops, grocery shops and supermarkets in the towns of Mandla and Dindori was from the Kanha Krishi Vanopaj Producer Company (Kanha KVPC) that locally sources and processes millets. The company has been facilitated under the National Rural Livelihoods Mission (NRLM). Another notable brand of millet value added products is by self-help groups linked to the Tejaswini Rural Women Empowerment Programme, which is a government supported federation of Women's Self Help Group based in Mehandwani town. Kodo millet rice was the most common value added product found in the districts.



Kodo millet.
Credit: Bioversity International/G. Meldrum



Kutki millet.
Credit: Bioversity International/G. Meldrum



Millet aggregators in Madhya Pradesh. Credit: Bioversity International/G. Meldrum

Stakeholders interviewed reported that millet products are becoming more popular in Mandla and Dindori as non-tribal customers get to know about its nutritional properties and aptness for diabetic diet. For instance, a seller in Mandla reported an increase of kodo and kutki millets sales from 15 kg to 120 kg per month during the last five years. The increased awareness of their health benefits also increase the willingness for consumers to pay higher prices for the processed products. In Mandla city, in the specialized shops, prices up to Rs.85/kg for kodo and Rs.115/kg for kutki could be found.

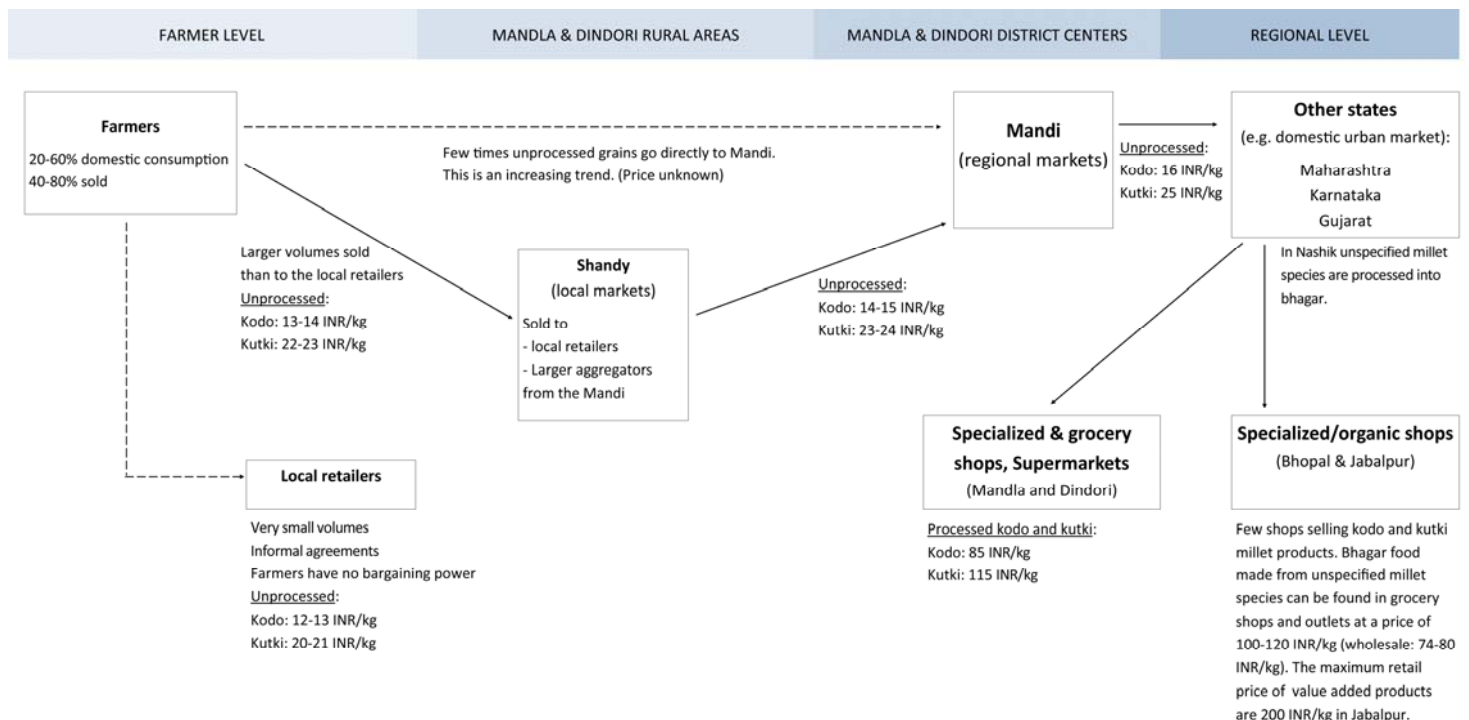
Despite a growing awareness and availability of value added products of small millets in Mandla and Dindori, the marketing of millets was still found to be quite low in urban centres of

Madhya Pradesh. The team did not find a single restaurant serving kodo and kutki millet based food items in all the areas surveyed. This may be related to the millets still being stigmatized as “food for the poor” and thus not perceived appropriate to serve in a restaurant. In Bhopal and Jabalpur it was not easy to find shops, even specialized or organic food shops, selling kodo and kutki millet and the products found were often sold unbranded. One of the few shops selling minor millets in Jabalpur was an organic shop selling 40-50 kg of kodo and kutki millet per month. With a shelf life of only three months after processing, a demand for kodo and kutki millet is needed before sellers would invest in millet products. According to a vendor with

considerable experience in trading millets in Jabalpur, the quality of processed millet from Dindori and Mandla districts were rather poor, resulting in sellers prioritizing more expensive millet of higher quality sourced from other far off areas. While specifically, kodo and kutki products were not easily found in these cities, bhagar food was found in grocery shops and outlets with retail prices ranging between 100-120 INR/kg (wholesale 74-80 INR/kg).

Minor millets’ underutilized potential

Madhya Pradesh is one amongst the states in India with the poorest level of nutrition: 60% of the children are underweight compared to 43% at national level. Kodo and kutki millets provide good sources of phosphorus and iron and higher protein content than rice. Because of this high nutritional value and their capacity to even thrive on poor quality soils under water-limited conditions, small millets have great potential to help alleviate nutrition insufficiencies in the State. Minor millets have largely been replaced by rice in most areas of India. Yet, in Mandla and Dindori, kodo and kutki continue to hold an important subsistence role for tribal communities. The development of the value chain for these crops can be a viable income earning opportunity for these



producers, while also contributing to a more nutrition-sensitive and climate-resilient agricultural production.

The study revealed that consumers in Madhya Pradesh have fairly positive associations with millets as good, healthy and nutritious food and there is a willingness to increase millet consumption. Nonetheless, in the cities a lack of awareness about kodo and kutki millets and their positive values is a main challenge for limiting consumer demand. Advertisements and other awareness raising activities could be an effective means to stimulate interest among urbanites to consume small millets. Millet crops have recently received a lot of national and international attention as traditional gluten-free superfoods. This renewed perception further enhances the potential for these cereals to be reasonable economic investment for smallholder farmers in India, while improving local livelihoods, nutrition and resilience. Local farmers have the opportunity to take advantage of this momentum before distant suppliers take actions to meet the growing demand.

Urban consumers in Madhya Pradesh are mainly consuming small millets as a fasting food. The main species consumed for this role is moredhan, while kodo and kutki could also be suitable for this role. The study showed that millet production from Mandla and Dindori is largely transported to Nasik, Maharashtra where there exist several processing centres that produce bhagar food. The packages of bhagar food produced by these processors do not always indicate the species of millet. The brands of such fasting food found on the shelves of local supermarkets in Madhya Pradesh were primarily produced in Nasik, which implies a large inefficiency in the value chain with high transport costs shipping 1000-1100 km to Nashik and back (transport estimated at up to 1.4-1.8 Rs/kg kodo and kutki millet with several loading charges and commissions). A locally produced fasting food could overcome this

inefficiency and enable the farmer producer companies to market at a competitive price relative to the established brands.

Low yields, especially under increasing drought risk, are a major challenge limiting the contribution of small millets to farmers' livelihoods in Mandla and Dindori. Introducing new varieties of millet is acknowledged as an important strategy for adapting to climate changes. Generally low genetic variety exists among millet producing farmers in the study area. Some improved varieties have been released that have much better performance than local varieties, but adoption has been fairly low. Recent efforts of farmer producer companies supported by ASA in Mandla and Dindori have been aiming to raise seed availability for high yielding varieties. Further action to promote adoption of these improved varieties, as well as following enhanced cultivation methods, can be key for overcoming many of the bottlenecks faced in minor millet production.

Minor millets are today important for the livelihoods and food security of the farmers cultivating the crops and they have the potential to maintain and even further regain importance in the future as a modern and healthy alternative to rice. These benefits should be appropriately tapped by the tribal farmers who traditionally have refined the cultivation techniques of kodo and kutki millets through centuries and for whom such millets have immense food and cultural values. By supporting local production and market of millet in Dindori and Mandla district, this area can again become one of the important centres for millet production in India. Efforts by government and NGOs towards conservation, cultivation, consumption of millets is appreciable, but a stronger and more focused approach is needed to arrest the decline of cultivation area and revive the consumption of millets by giving it a respectable tag of crop that is adapted to the environment of the districts and healthy food for all.



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Bioversity International
Via dei Tre Denari, 472/a
00054 Maccarese (Fiumicino), Italy
Tel. (+39) 06 61181
Fax. (+39) 06 6118402
bioversity@cgiar.org

www.bioversityinternational.org
www.nuscommunity.org

Action for Social Advancement
E-5/A Girish Kunj
Arera colony, Bhopal
Madhya Pradesh-462016, India
info@asabhopal.org
www.asaindia.org

