



Proceedings of the stakeholder workshop
Small millets in eastern Madhya Pradesh: Challenges and opportunities for value chain development

20 April 2018, Mandla, Madhya Pradesh, India

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Contributors

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Proceedings

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Conference organization

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Background

Kodo (*Paspalum scrobiculatum*) and kutki (*Panicum sumatrense*) are two millet species of great value to the traditional agricultural systems of Madhya Pradesh, predominantly grown by poor and marginal farmers. Their cultivation has dramatically declined over the years as a result of reduced economic competitiveness of these species with other mainstream cereals, like rice and wheat. Over the last few years, a growing interest to revive their cultivation is emerging, driven by resilience, nutrition and health considerations. Millets, in fact, thrive well in drylands and at high temperatures, perform reasonably well in poor soils, in low moisture conditions and with scarce external inputs. Their hardiness and good nutritional profiles are also most valuable in support of ongoing quest towards production systems able to cope with worsening climate conditions.

In view of the strategic importance of millets, Bioversity International and Action for Social Advancement (ASA), have been working since 2016 on the IFAD-EU supported project “**Linking agrobiodiversity value chains, climate adaptation and nutrition: Empowering the poor to manage risk**” aiming at promoting the use of these species in Mandla and Dindori Districts. During the implementation of the project, a value chain analysis was carried out and a number of important findings emerged to inform a sustainable and equitable value chain development for these crops.

This workshop was organized on 20 April 2018 to share the results of the value chain assessment carried out in 2016 and 2017 in eastern Madhya Pradesh and to debate collectively with experts, farmers, community members and other value chains actors on a number of issues emerging from the study. Specifically, five themes were explored in the discussions:

1. Availability and willingness to use certified millet varieties
2. Processing in the household and increasing rural consumer demand
3. Improving consumer demand in urban markets of Madhya Pradesh
4. Potential for developing a local bhagar food brand
5. Farmer access to public value chains for small millets

These and other issues were debated in the course of the meeting that was attended by actors from across the value chain. The results of the meeting, which are shared throughout this document, steered the final year of implementation of the project with regard to the identification of specific interventions for the use enhancement of kodo and kutki for improved local livelihoods, resilience and nutrition.

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Programme

20 April 2018

9.00-10.00	<i>Registration and tea</i>
10.00-11.00	Inaugural Session Conductor: Shri Ashis Mondal/ASA
10.00-10.15	Welcome by ASA with flower bouquet and lighting of lamp (Mrs. Sufia Farooqui Wali/IAS, Collector/Mandla, Dr SK Chaubey/RARS Dindori, Mr. P.L. Sahu/DDA, Dr Stefano Padulosi/Bioversity International, Dr Oliver King/MSSRF, Ashis Mondal/ASA, Chairpersons)
10.15-10.30	Chief Guest Introduction speech – Ashis Mondal, Director ASA Opening speech – Dr Stefano Padulosi, Global Project Coordinator, Bioversity International
11.00-11.30	<i>Tea/Coffee Break with millet snacks prepared and served by tribal women self help groups</i>
11.30-13.00	Technical Session I – Commodity value chain development for kodo and kutki millets Chair: Dr Stefano Padulosi/Bioversity International
11.30-12.00	Result of value chain study of small millets in Madhya Pradesh (Dr Oliver King/MSSRF)
12.00-12.15	Feasibility of promoting <i>bhagar</i> in Mandla/Dindori (Dr H.S. Yadava/RVSKVW)
12.15-12.30	Tejaswini Project Federation – Experience Sharing
12.30-12.45	Small millet value chain players: Mandla and Nashik (Mr. P.L.Sahu/DDA, Mandla)
12.45-13.00	Open house discussion with special focus on market development for urban and rural consumers for small millets and the role of farmer producer organizations
13.00-14.00	<i>Lunch Break with millet dishes prepared and served by tribal women self help groups</i>
14.00-15.30	Technical Session II – Value chain development for certified seeds of small millets Chair: SK Chaubey/RARS, JNKVV, Dindori
14.00-14.30	Presentation 1 (Sharad Mishra/ASA)
14.30-15.00	Presentation 2 (Dr Pratibha Das and Dr DN Shrivastava/RARS Dindori)
15.00-15.30	Open house discussion
15.30-16.00	<i>Tea/Coffee Break with millet snacks prepared and served by Tribal women self help groups</i>
16.00-17.30	Technical Session III – Linking farmers to public value chain for small millets (PDS, MDM & Anganwadi), policy debate with invited guests Chair: Dr HS Yadav
16.00-16.30	Keynote address and experience sharing by MSSRF (Dr Oliver King/MSSRF)
16.30-17.00	Initiative taken by Tejaswini lean
17.00-17.30	Open discussion: The way forward
17.30-17.45	Closing remarks and vote of thanks

Inaugural session

Introductions by chief guests

Following the words of welcome by ASA, the ceremonial lamp was lit and Mr. Ashis Mondal (ASA) and Dr Stefano Padulosi (Bioversity International) formally introduced the workshop.

Ashis Mondal, Director, ASA

ASA has been working in Mandla and Dindori district since 2011 to enhance the cultivation and promote the use of kodo and kutki millet. Kodo and kutki are here seen as an alternative to wheat and rice, useful for marginalized landscapes and extensively relevant due to the changing climate.

ASA is supporting the establishment of millet producing Farmer Producer Companies (FPCs), training farmers on soil and water management practices, providing good quality seed and facilitating the exchange of seeds among farmers. These activities are all involving more than 3000 farmers.

The FPCs aggregate and sell their produce directly to processing units in Nashik and thus a larger share of the added value reach farmers in the FPCs than farmers selling to the market.

Dr Stefano Padulosi, Bioversity International

A decrease in biodiversity leads to a limited chance for people to benefit from nutrition, markets, climate change adaptation, ecosystem services etc. Value chain interventions are likely to contribute to the solution of decreasing biodiversity.

In Mandla and Dindori districts, the price trend for kodo and kutki millet is increasing. In 2011 farmers would in average be able to sell their products for 4-5rs/kg and no actual market existed. Today the price has increased to 20-22rs/kg and as such, millets that used to be **'food for the poor'** are **now becoming 'food for the rich'**. **Today** a market for millet exists and increase in cultivation of millet can thus lead to increase of income in the area.

Though the NUS project's focus is currently on millets as an isolated crop, there is a need to increase the scope to include the entire cropping system around millets, which collectively contribute to a nutritious local diet. Conservation of the whole system is essential to meet the objective of the project.

However, many issues still challenge the millet production including short shelf life and a lack of processing machines suitable for small-scale farmers. Processing of kodo is particularly difficult and currently there is no suitable technical solution available for the farmers to use, which is the reason why they are still using old machines. Furthermore, no bi-products are currently being made from the waste product of kodo and kutki millet. Research is however being done on this matter.

Technical Session I: Value chain development for kodo and kutki millets

Value chain study of small millets in eastern Madhya Pradesh

Dr Oliver King, MSSRF

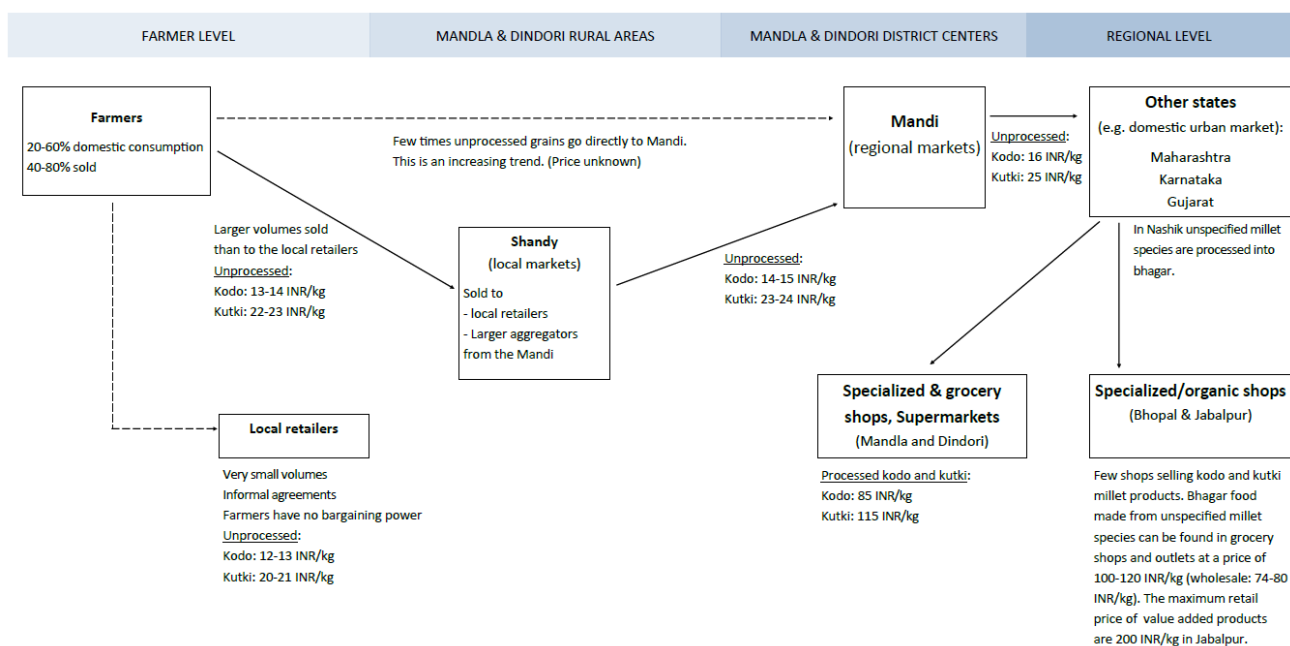
Under the lead of Dr E.D Isreal Oiver King, a value chain analysis of kodo and kutki millet was carried out in 2017 in Madhya Pradesh by Bioversity International, M.S. Swaminathan Research Foundation, and Action for Social Advancement. At the meeting, Dr King presented some of the main findings:

- Production
 - Millet is usually found in mixed cropping patterns with niger seed, amaranth, lentils, pulses and oilseed.
 - According to the agricultural department in Madhya Pradesh, the area of cultivated kodo and kutki in Mandla and Dindori districts is around 60,000 ha.
 - **The yields estimated for last years' kodo production ranged from 75-500 kg/acre and that of kutki between 100-240 kg/acre.**
 - Farmers reported decreasing trends for cultivation of millets as a result of shifting to other crops, drought, lack of seed and for pest issues.
 - Despite challenges, many producers has increased their production of kodo and kutki in recent years. The reasons for increasing production were increasing price and awareness of health benefits, increasing yields, and increasing family need.

- Consumption
 - In the rural areas of Mandla and Dindori, kodo and kutki have a very important subsistence role for tribal communities.
 - In nearby towns consumers were aware of millets but prefer paddy rice because of its greater availability, lower price, ease of processing, and preferred taste.
 - Consumers in the cities of Bhopal and Jabalpur are largely unaware of kodo and kutki millet. However, 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 and nutrition.
 - Millet crops have recently received a lot of national and international attention as traditional gluten-free superfoods. This renewed perception enhances the potential for millets to be an economic investment for smallholder farmers in India.
 - Awareness should be increased in urban areas as well as in schools about small millets many nutritive and ecological benefits.
 - The potential of producing a local fasting food instead of importing from Nashik should be explored.

- Value chain marketing (see value chain diagram below)
 - In Mandla and Dindori district there are three mills. The main dehuller station in Mandla buys kodo and kutki millet for 20-25rs/kg and sell the cleaned rice for 80rs/kg.
 - Much of the millet produced in Mandla and Dindori is send to Nashik. Transportation price of kodo and kutki to Nashik is 2-3rs/kg. In Nashik there are 21 mills producing bhagar but only one label specifies the content of the products. Bhagar products in Nashik are sold for 80-85rs/kg.
 - **The bulk of farmers' millet yield is consumed domestically** but around 50% of producers are selling part of their production to local retailers, the local markets (shandy), to neighbours, or to local farmer producer companies.

- Small millets from Mandla and Dindori are largely transported to Nashik, 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.
- NGOs and government programmes are working with farmers to shorten the value chain. E.g. farmer producer companies supported by ASA have engaged in aggregating grains and selling cleaned and graded grains in bulk. Other initiatives existing in the area include Kanha Krishi Vanopaj Producer Company and Tejaswini Rural Women Empowerment Programme.
- No restaurants were found serving meals with kodo or kutki millets.
- Experience of millet production from more advanced states should be brought to Mandla and Dindori districts to enhance the production with a special aim to reach young farmers.



Value chain for kodo and kutki millet cultivated in Mandla and Dindori district.

Feasibility of promoting *bhagar* in Mandla and Dindori

Dr H.S.Yadava, RVS Agriculture University

Given the importance of the bhagar food market detected in the market assessment conducted by MSSRF, this presentation was organized to understand better the potential for its promotion in Mandla/Dindori. Barnyard millet is the major species used in bhagar food preparations and the presentation focused on this species, while it was acknowledged by Dr Oliver King that other species of millets are also being used in bhagar food preparations.

Barnyard millet (*Echinochloa sp.*) is one of the small millets grown in India, known locally as *Sawa* (Hindi) or *Mordhan* or *Bhagar* or *Jangali rice grass*

There are two cultivated species of barnyard millet viz., *E. esculenta* commonly known as Japanese barnyard millet and *E. frugmentacea* known as Indian barnyard millet or billion-dollar grass. These two species are often confused with the wild species *E. crus-galli* and *E. colona*, which are the wild progenitors of *E. esculenta* and *E. frugmentacea*, respectively. Both species possess robust plant type and huge compact panicles with awnless grains compared to their wild counterpart.

E. frugmentacea (domesticated) and *E. colona* (wild progenitor) most likely originate from the Indian subcontinent. The growing season of *E. frugmentacea* is June-Oct, Sept-Dec and Feb-June; it grows in shallow to deep soils, with low to medium water requirement. The growing season of *E. colona* is June-Nov; it grows in medium to deep soils, with a medium to high water requirement. The former is susceptible to head smut, grain smut and kernel smut as well as shootfly, while the latter is susceptible to viruses, nematode, tungro and rice yellow dwarf.

There are 11 released varieites of *E. frugmentacea* and 1196 + 49 accessions, while none has been released for *E. colona*.

E. frugmentacea is conventionally prepared as rice, while it can also be consumed as a popped grain or as industrial bakery products. *E. colona* is usually prepared as *kheer* and *puri*.

The nutritional composition of barnyard millet shows that it has generally less protein, carbohydrate, fat, dietary fibre and calcium compared to other small millets.

Currently in Madhya Pradesh the most common small millets are kodo and little millet, which together cover a production area of 155,000 ha, yielding 101,000 tones of millet annually with averagely 640 kg/ha. The other small millets—barnyard, foxtail and finger millet—cover a much smaller area, 30,000 ha, with annual production of 19,000 tones millet and a slightly lower yield, 496 kg/ha.

E. colona is used as a fasting food and is mainly found in forms of weed with low yield. Whereas high genetic diversity and several varieties can be found of *E. frugmentacea* including **high yielding varieties**, POPs etc.

Since *E. colona* is the wild progenitor of the cultivated *E. frugmentacea*, both species should be noticed in the Indian context for their consumption as fasting food and daily food, respectively.

Experience sharing by the Tejaswini Project Federation

Mr. Ajay Modi

The Tejaswini Rural Women's Empowerment Programme was invited, as they are significant actors in promoting value chain development of small millets in eastern Madhya Pradesh.

Experiences were shared from the IFAD-supported Tejaswini Rural Women's Empowerment Programme. Through self-help groups (SHGs), the Tejaswani Project Federation have engaged women in millet production in Mandla and Dindori districts. Activities have included capacity building through value chain workshops and development of value added millet products. Tejaswani SHG federation has also established a brand, which is being marketed in local bazaars and urban markets. The products are slowly gaining market share. As a result of this initiative, the local domestic consumption of small millets has increased as well as the urban market demand.

Reflections shared by small millet value chain players

Mr. P.L.Sahu, DDA, Mandla

Informed by the results of the value chain analysis conducted by MSSRF, key stakeholders in the small millet value chain of Mandla and Dindori districts were invited to contribute to the discussion on the value chain assessment and current challenges and opportunities for development. Key-stakeholders in Nashik were not able to participate in the meeting but expressed interest in organizing a workshop with stakeholders in Mandla and Dindori in order to strengthen the value chain and explore better collaboration. An important contribution was made by the largest trader of small millets in Mandla, Mr. Rawla.

Nashik traders are the exclusive reason for the demand of small millets in Mandla and Dindori districts. Currently 1000 lorries with each 16-20 tons are going to Nashik from Mandla/Dindori per year, which is equivalent to around 18.000 tons of millets.

There is full transparency and no exclusiveness in the millet value chain between Mandla/Dindori districts and Nashik.

Of the total quantity of millets being traded from Mandla and Dindori district, Mr. Rawla is responsible for around 50%. He suggested the raw product to be 1:3 of the final price.

According to him, no action is needed to increase the demand. The demand is currently increasing and will continue to increase naturally.

Despite of a growing millet market, storing at home is more important than selling. Millet is an important insurance to poor farmers due to the possibility of storing unprocessed millets for many years.

As it is today, kodo millet is perceived as a grain and is therefore not attractive as a product to use for bhagar production. Kutki, however, is suitable since this is cultivated on slopes and marginal lands and therefore believed to grow more 'naturally' in the soil.

Kodo millet is associated with a stigma of being toxic, which is effecting the demand negatively.

Plenary Discussion:

Market development of small millets for urban and rural consumers in eastern Madhya Pradesh

Following the invited contributions, the floor was opened to all participating stakeholders to comment and discuss current challenges and opportunities in the value chain development of small millets in eastern Madhya Pradesh. Several people came to the microphone. Major points raised in the discussion are summarized below.

Though there has been a decrease in the number of farmers growing millet during the last decades, a new market for millets is evolving and thus there has never been traded as much kodo and kutki as there is today in Mandla and Dindori district. These districts are also still the ones producing the highest amount of kodo and kutki in Madhya Pradesh.

According to the farmers, the trend of a decreasing cultivation area of kodo and kutki has turned and the cultivation area is now slowly increasing. This is the result of varieties that are more available and an enhanced knowledge on cultivation practices. However, there are still many barriers and generally the return price is too low when considering the production efforts.

It was clarified that kodo millet does not naturally contain toxins but that the crop is susceptible to fungal infestation as a result of poor post-harvest drying practices. This is because rice is often harvested at the same time as kodo millet and thus the processing of rice is prioritized for kodo. If more than 2% of the produce do not meet the quality standard, the price will decrease substantially, which is often the case for kodo millet due to this fungal infestation. Training farmers in proper post-harvest practicing for kodo is needed in order to avoid development of fungus.

Increase of the demand for kodo and kutki products from the local society would allow kodo and kutki products to be sold at a lower price for the benefit of the community.

Technical Session II: Value chain for certified seeds of small millets

Certified seed value chain development for small millets in eastern Madhya Pradesh

Sharad Mishra, Mandla and Dindori Area Manager, ASA

In Mandla and Dindori districts, community members have the practice of consuming millet as part of their daily diet. Community members have expressed interest in adopting improved millet seeds and receive practice on package (PoP) training.

Introducing varieties and trials

Research has been initiated to find good sources to millet seeds. PoP workshops have been conducted as well as meetings with the State Agricultural Universities (SAU), Indian Council of Agricultural Research (ICAR), the CGIAR system and other NGOs and research institutes.

A number of varieties of small millets such as kodo, kutki, proso, barnyard and foxtail millets have been identified. These varieties are being tested on farmer's field through CS/Participatory varietal selection & Promotion (PVSP)/FLD trials.

So far, 22 varieties including **farmers' varieties** have been collected from different sources and are being tested on **farmers' fields**.

Based on farmers group discussions in the project villages, 9 varieties of millet are widely accepted by the community, considering all technical parameters of CS and PVSP.

These are accepted varieties: Kodo Millet: **Farmers' Varieties**, JK-439, JK-41, JK-137; Kutki: JK-8, JK-36 and **farmers' varieties** (*Black Kutki*); finger millet: GPU-28 (JNKVV). A millet certification seed production programme has also been conducted in the project villages in the period 2016-17.

ICAR (NBPGR) assured to supply barnyard millet seed from their genebank this year as the crop has potential to grow in the project area but unfortunately got extinct because of the lack of availability of seeds

Over the last two years, a total of 494.82 kg of certified millet seed has been produced and certified through M.P State Certification Agency (MPSCA).

Technical inputs

Dr. Pratibha Das, Scientist, Regional Agriculture Research Station, Dindor (A Research unit of Jawaharlal Neheru Agriculture University).

- Millet seed production programme including a field trials/crop mission
- Training of trainers (ToT) and package of practices (PoP)
- Kutki millet is usually grown on steep slopes, which complicates the cultivation practice because soil management is harder, it is difficult to work with machines on steep lands and the natural erosion complicates active enrichment of the soil with e.g. lime.

Mr. P.L. Sahu, Deputy Director Agriculture, Mandla

The district director of agriculture, P.L. Sahu, shared a number of good practices relevant for farmer to enhance kodo and kutki cultivation:

- To conserve and store seed for next year's cultivation on site and exchange these with other local farmers. This is a cheaper solution than getting the millet seed from other places.
- To find a solution to store water on site, e.g. wells or other water storage feature.
- To mix the harvested millet with chili to protect it against fungus and insect attacks.
- To fertilize the soil and add minerals by spreading ashes from burned leaves on the soils.
- To test the percentage of germinating seeds before sowing to use the right amount of seed on the lands. This can be done by taking a certain amount of seed and planting them in a tray. The number of seeds germinating indicate the percentage of the seeds that will germinate in the soils.

Plenary Discussion:

Developing the small millet seed value chain

Following the invited contributions, the floor was opened to all participating stakeholders to comment and discuss current challenges and opportunities for developing the small millet seed value chain. Several people came to the microphone. Major points raised in the discussion are summarized below.

- Along with a decreased demand for millet and thus the arrival of more powerful middlemen in the millet value chain, actions should be taken to achieve traceability in the full chain to allow farmers to take share in the derived benefits.
- Farmers expressed agreement in the findings of O. King, that 40-60% of the farmers process and consume millets in house. Of these, 70-80% consume millets at least once per week. Hence, farmers account for the largest part of the value chain and are therefore the most important stakeholders. The main constrain for home consumption is the tiresome processing. Farmers demand training on better practices.
- Farmers are aware that poor processing can lead to less nutrients in millets and therefore also call for training on better processing practices.

Technical session III: Linking of farmers to public value chain for small millets

Reflection on experiences linking farmers to public value chains for small millets

Dr. Oliver King, MSSRF

Important Policy Pointers for bringing millets into public food and nutrition programmes:

- India food security Act 2013 – Inclusion of millets in the Public Distribution System (PDS). [Gazette Notified on 13 April 2018 F No: 4-4/2017-NFSM](#)
- [National year of Millets - 2018](#)
- Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP) – National Food Security Mission (NFSM) – Submission on Nutri-cereals
- Bringing Millets into PDS: Availing the PDS subsidy is crucial as rice is supplied at Rs 1 per kg where as millet price varies between Rs 35 to Rs 55.
- Linking Millets to Production Systems: If linking is not done with local production systems then sustainability is very low.
- Location specific menus: Menus promoted should be based on the local traditional consumption patterns.
- Decentralized Processing: Due to short shelf life, without decentralized processing, any inclusion of millets will face uphill challenges of pest infestation and storage

Crucial Issues in bringing millets into Public Nutrition Programmes

- Zeroing on the millet - Linking it to local production systems
- Participatory recipe development (Food Festival). Recipes thus developed should be
 - Location Specific
 - Popular & Acceptable
 - More nutritious
 - Palatable for children and adults
- Cost Analysis
- Processing at local level due to low shelf life of processed millets
- Orientation/Sensitisation/Training of the stakeholders

The Millet revolution should be a consumption revolution, rather than a production revolution.

Plenary Discussion:

Promoting small millet development through public value chains

Following the invited contributions, the floor was opened to all participating stakeholders to comment and discuss current challenges and opportunities for developing the small millet seed value chain. Several people came to the microphone. Major points raised in the discussion are summarized below.

- On one hand kodo and kutki millet has a short shelf-life after it has been processed, which makes it difficult to implement in the PDS system and generally makes it less attractive to market actors. On the other hand, when not being processed millets can be stored for years, which makes it a source to food in times of famine and thus a security net for farmers.
- According to a recent announcement in the Gazette (13 April 2018) small millets will formally be included in the Public Distribution System (PDS), thus states are now requested to take the necessary actions to mainstream a range of millet species including kodo and kutki millet. The announcement also called for a change in the terminology used for millet, from coarse grain to NutriCereals. This change will likely increase the public demand and have a noticeable influence on millet farmers in all of India. As it is today, there is no security connected to the millet cultivation. The PDS system may even cause a decrease in the demand for millet, since paddy is so easily available.
- Seed banks with both local and improved varieties allow farmers to choose their preferred variety. Local preferences are related to taste, size of millet, color and other, which should all be considered in the efforts of encouraging people to eat more millet.
- Better harvest technology is needed for especially kodo millet, facing a number of challenges in terms of quality and fungus.
- Spreading awareness in schools is essential to teach future adults about nutrition, climate change adaptation and healthy diets.

Conclusions

Value chain actors across the various sectors largely agreed on the challenges that millets face today in eastern Madhya Pradesh as well as the strategies of how to overcome these barriers. Despite availability of new technological solutions for threshing millets, there is still a lot of drudgery connected to the removal of their hard seed coats ('de-hulling'). Furthermore, millets are often grown on slopes, which limits the use of agricultural machines. Again, another limitation is also represented by the short shelf-life of its processed grains, which makes it risky for retailers to buy a decent stock that would allow a regular availability of produce to customers.

From a mainstreaming perspective, although the amendment on the PDS is a great step forward, this policy has not yet been implemented in Madhya Pradesh, leaving majority of millet farmers awaiting for favourable conditions to support the cultivation of these crops. The recent call to implement this policy change should help in overcoming this bottleneck. A key message of the meeting was that the economic benefits that are on the rise thanks to the popularization of millets must be shared with farmers. Apart for that, it is also important **that farmers' households gain healthy benefits from the direct consumption of millets and in that regard, the project is set to introduce simple de-hulling machines to eliminate processing drudgery at community level.**



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