

Draft Indicative Concept Note
on
Assam Millets Mission



**Department of Agriculture
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1. INTRODUCTION& BACKGROUND

INTRODUCTION: Millets are a group of highly variable small-seeded grasses, widely grown around the world as cereal crops or grains for fodder and human food. Most species generally referred to as millets belong to the tribe *Paniceae*, but some millets also belong to various other taxa. Millets are important crops in the semiarid tropics of Asia and Africa (especially in India, Mali, Nigeria, and Niger), with 97% of millet production in developing countries. The crop is favored due to its productivity and short growing season under dry, high-temperature conditions. Millets are indigenous to many parts of the world. The most widely grown millet is pearl millet, which is an important crop in India and parts of Africa. **Finger millet, proso millet, and foxtail millet** are also important crop species grown in Assam on substantial area.

BACKGROUND: The United Nations General Assembly adopted an India-sponsored resolution to mark 2023 as the **international year of millets**. Government of India is committed to promoting millets and their cultivation. Accordingly, Government of Assam also is going to observe 2023 as year of millets in full and true spirit. It has been planned to set up a full-fledged Mission called **Assam Millets Mission (AMM)** over a period of seven years starting 2022-23. The activities under the Assam Millets mission will be taken up in value chain mode covering production (including seed production), post harvest, processing, value addition and market linkages. The key focus will be to address nutritional needs to Assam's population more particularly women (expecting, lactating) and children.

INDIAN SCENERIO OF MILLETS: Millets are grown in substantial area in India. In India, millets are mostly cultivated in Karnataka, Andhra Pradesh, Tamil Nadu, Maharashtra, Odisha, Madhya Pradesh, Rajasthan and Uttarakhand states. Rajasthan (87 per cent of Cumbu area), Maharashtra (75 per cent of sorghum area) and Karnataka (54 per cent of Ragi and 32 per cent of Cumbu) occupies maximum area of millets (Stanly and Shanmugam, 2013). Now a days, the productivity of millets is boosting through technologies and high yielding varieties. The area under small millets has shown a decreasing trend in last six decades i.e. 8 million hectare (1949-50) to 1.8 million hectare (2017-18). (Shadang and Jaganathan, 2014). The State-wise area, production and productivity in last four years (estimates in 2020-21 and 2021-22) is:

State/UT	Area ('000) Hectares				Production ('000 Tonnes)				Yield (Kg./Hectare)			
	2018-19	2019-20	2020-21*	2021-22**	2018-19	2019-20	2020-21*	2021-22**	2018-19	2019-20	2020-21*	2021-22**
Andhra Pradesh	223.00	236.00	206.00	69.00	301.91	514.19	494.78	93.56	1354	2179	2402	1356
Arunachal Pradesh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
Assam	5.21	5.21	5.00	5.00	3.06	3.23	2.99	3.01	587	619	597	601
Bihar	16.03	8.59	10.36	11.62	14.37	8.00	10.27	10.84	897	930	992	934
Chhattisgarh	97.48	72.00	61.28	52.29	33.71	24.56	26.91	16.62	346	341	439	318
Gujarat	480.37	496.07	516.94	206.38	1000.15	990.48	1081.35	387.65	2082	1997	2092	1878
Haryana	465.00	522.70	600.48	413.12	899.56	1034.90	1366.56	908.27	1935	1980	2276	2199
Himachal Pradesh	6.82	7.08	7.28	7.32	5.95	6.81	8.09	8.13	872	961	1112	1111
Jammu & Kashmir	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0
Jharkhand	16.20	16.67	20.75	16.49	12.77	14.31	17.82	15.68	788	859	859	951
Karnataka	1673.71	1838.60	1770.00	904.10	1762.17	2555.60	2545.86	1341.73	1053	1390	1438	1484
Kerala	0.48	0.56	0.51	0.07	0.47	0.54	0.57	0.07	992	971	1121	998
Madhya Pradesh	491.00	487.89	513.00	632.00	851.34	895.71	983.82	1172.58	1734	1836	1918	1855
Maharashtra	2368.10	3086.56	2683.20	827.00	1319.31	2428.70	2508.78	667.76	557	787	935	807
Odisha	78.79	76.44	82.99	94.46	48.18	48.07	54.88	58.62	611	629	661	621
Punjab	1.10	0.50	1.00	0.00	0.72	0.32	1.00	0.00	651	635	1000	NA
Rajasthan	4755.02	4940.13	4885.69	4334.11	4288.34	5146.89	5125.91	4960.39	902	1042	1049	1145
Tamil Nadu	533.58	627.88	586.91	307.48	873.47	1017.03	947.86	537.79	1637	1620	1615	1749
Telangana	65.00	100.00	114.00	23.40	72.25	139.15	201.70	22.41	1112	1392	1769	958
Uttar Pradesh	1030.00	1093.00	1093.00	1027.00	1967.27	2171.91	2298.20	2280.61	1910	1987	2103	2221
Uttarakhand	148.00	137.00	138.00	149.00	179.74	191.09	200.85	223.32	1214	1395	1455	1499
West Bengal	8.83	9.20	9.02	4.50	7.57	9.83	10.62	5.60	857	1068	1178	1243
Others	79.29	67.17	62.37	44.24	68.91	59.32	70.02	48.75	869	883	1123	1102
All India	12543.01	13829.25	13367.77	9128.56	13711.21	17260.63	17958.84	12763.36	1093	1248	1343	1398

* As per 4th Advance Estimate 2020-21, **As per 1st Advance Estimates

2. NUTRITIONAL VALUE OF MILLETS

Millets are an important staple cereal crop for millions of smallholder dryland farmers across Asia and sub-Saharan Africa. They are also called **nutri-cereals** or dryland cereals, and include sorghum (jowar), pearl millet (bajra), finger millet (ragi), foxtail millet (kangni), proso millet (chena), barnyard millet (samvatke chawal) and kodo millet (kodon), and offer high nutritional benefits. Millets are also referred to as **Smart Food**, which are good for the consumers, the planet and the farmers. For instance, *finger millet has three times the amount of calcium as in milk, and most millets have very high levels of iron and zinc, low glycemic index, good levels of protein and fiber, and are gluten-free*. Millets can also contribute to addressing some of the largest global issues in unison: poor diet (malnutrition to obesity); environmental issues (climate change, water scarcity and environmental degradation); and rural poverty. They have a *low carbon footprint and have the ability to survive and grow in warm climate with very little water*. They are *climate-smart and hence constitute a good risk management strategy for farmers* as compared to rice and wheat crops, which require higher quantities of water and fertilizer supplements.

3. MILLETS IN ASSAM

The major millets grown in Assam are finger millet, fox tail millet and sorghum. The recent area, production, productivity figures of various millets in Assam is provided below:

Sl	DISTRICT	AREA	PRODUCTION	PRODUCTIVITY
		(Hectares)	(Tonnes)	(Kg/hectares)
1	NAGAON	1586	714	450
2	BONGAIGAON	1084	626	578
3	DHUBRI	677	963	1422
4	MORIGAON	520	234	450
5	BARPETA	507	358	705
6	TINSUKIA	379	203	535
7	KOKRAJHAR	325	214	658
8	BAKSA	302	315	1042
9	GOALPARA	280	252	900
10	K. ANGLONG	229	152	665
11	KAMRUP (R)	150	78	524
12	SONITPUR	149	85	570
13	JORHAT	133	85	642
14	GOLAGHAT	58	27	470
15	UDALGURI	45	30	676
16	KAMRUP (M)	41	19	469
17	DARRANG	35	27	785
18	CACHAR	25	12	470
19	LAKHIMPUR	24	13	525
20	NALBARI	18	9	499
21	DHEMAJI	16	13	851
22	CHIRANG	7	11	1500
23	SIBSAGAR	5	3	567
24	HAILAKANDI	5	3	619
25	KARIMGANJ	2	1	619
25	DIBRUGARH	0	0	0
27	DIMAHASO	0	0	0
	ASSAM TOTAL	6602	4447	674

(Source: RARS, Gosaigaon, Assam)

It may be worth noting that top 15 districts occupy around 97 percent of the area under millets and about 97 percent of the State's production. While the mission interventions on production side will be guided by geographies (*dryland*), *possibilities of crop diversification and bringing fallow land (particularly post rice) under cultivation*, **initially it has been proposed that interventions will be taken up in these 15 priority districts.**

4. ASSAM MILLETS MISSION- OBJECTIVES& STRUCTURE

Objectives of Assam Millets Mission (AMM): The Mission is planned to be taken up in a *value chain approach* with the following objectives:

- a. Increase household consumption of millets to enhance rural household nutrition security & to create demand for millets with focus on women and children
- b. Promoting millet processing enterprises to capture markets for various value added products of millets
- c. Improving productivity of millet based cropping systems and make them profitable
- d. Inclusion of millets in State nutrition programs and public distribution system& other schemes
- e. Increasing penetration of millets consumption in urban diets.

The activities in the Assam Millets Mission (AMM) will be taken up under the following Components and subcomponents:

A. Market and nutrition supportive production

- a. Technology demonstrations
- b. Minikits distribution
- c. Seed production & distribution
- d. Farm machinery
 - i. Sprinkler systems
 - ii. Seed cum fertilizer drills
 - iii. Inter-culture equipment
- e. Cropping system demos with pulses

B. Post-harvest& value addition side aspects

- a. Post-harvest demonstrations on drying & quality preservation
- b. Post-harvest machinery
 - i. Dryers
 - ii. Thresher
 - iii. Pulveriser
 - iv. Value added products making machinery
- c. Static storage facilities
- d. Storage bins

- e. Nutritious millet products development fund

C. Market linkages

- a. Millet based FPCs
- b. CSCs under FPCs (for aggregation, cleaning, grading, drying, processing etc)
- c. Buyer Seller Meets
- d. Value Chain Schools (VCSs)
- e. Product exhibitions

D. Ensuring better nutrition, healthy & disease free Assam through millets

- a. Distribution of millets based products in rural areas
 - i. Mobile outlets
 - ii. Awareness creation
 - iii. Supply of millet based products in rural areas
- b. Millets in mid day meal scheme (through education Deptt- SSA)
 - i. Awareness creation
 - ii. Supply and distribution in schools
- c. Millets nutrition in adolescent & lactating women and children (in collaboration with POSHAN Abhiyan, Deptt of Social Welfare)
 - i. Nutrition camps for women & children (urban and rural areas)
 - ii. Supply to POSHAN Abhiyan (Social Welfare Department)

E. Administration, operations, training & capacity building,

- a. Governing Body of the Mission at State level
- b. Core Mission Implementation Units & Operational Implementation Units
- c. PMU at State level
- d. Setting up of District level Millets Cell
- e. Exposure visits
- f. Trainings
- g. Millets (& pulses) business conclaves (3)
- h. Millets Knowledge Bank (MKB)

5. COMPONENT-A

MARKET & NUTRITION SUPPORTIVE PRODUCTION

The activities under the mission will be taken up in a *value chain approach* covering pre-production (seed), nutrition supportive production, post harvest management, value addition and processing, marketing and also covering cross cutting aspects like better nutrition, training, capacity building, skilling and knowledge transfer & management. A brief description of activities to be taken up under the mission is provided below:

A.1: Technology demonstrations: *The key objective of technology demonstrations following scientific package of practices is to reach national average productivity of around 1 MT/ ha which currently is only around 600 Kg/ ha.* Latest millet production technology will be sourced from reputed institutes like International Crop Research Institute for the Semi Arid Tropics (ICRISAT), Hyderabad. Technological tie ups will also be set up with Indian Council of Agricultural Research (ICAR)- Indian Institute of Millets Research (IIMR)- Hyderabad. Package of Practices (PoP) of Assam Agricultural University (AAU) will be followed for demonstrations. The demonstrations will be taken up with progressive farmers who are ready to share their knowledge and learnings with other farmers. The key objective of these demonstrations will be to disseminate the scientific package of practices and innovative technologies among the farmers so that they are able to adopt these practices/ technologies in their own fields in subsequent seasons. The targeted numbers will be divided under three crops i.e. finger millet, fox tail millet and sorghum and demo locations to be decided on geographical and other considerations like crop diversification and fallow land to be brought under cultivation. MoUs will be signed with organizations like ICRISAT, IIMR etc for technical collaborations.

A.2: Minikits distribution: Minikits of one kg seed each will be provided to farmers for sowing in their fields. The basic objective of minikits is to encourage farmer to farmer spread of awareness and so also seeds. This also promotes self-learning among the farmers through observation and experience of growing new varieties. Minikits are good way to ensure spread of new and promising varieties among the farmers. The farmers may be advised to follow AAU PoP in minikit demonstrations. The targeted numbers will be divided under three crops i.e. finger millet, fox tail millet and sorghum and demo locations to be decided on geographical and other considerations like crop diversification and fallow land to be brought under cultivation.

A.3: Seed production & distribution: Millets seeds production will be taken up with progressive farmers and FPCs (as and when they are formed). Breeder and foundation seeds of promising varieties will be sourced from Indian Institute of Millets Research, Hyderabad. For seed production technical support of Assam Agricultural University (AAU) will be obtained. It is worth mentioning that Regional Agricultural Research Station (RARS), Gosaigaon under AAU has done extensive work on finger millet (var: AAU-GSG-Marudhan) and fox tail millet (var: Gossaigaon Local -Yellow Seeded) breeder seed production. Accordingly, seeds may also be sourced from RARS Gossaigaon as per requirement. The seed certification will be done by Assam Seed and Organic Certification Agency (ASOCA). Distribution of seeds to farmers will be done through District Agriculture Offices and Agriculture Development Officers (ADOs). Testing & trials of new promising varieties for future area expansion may be done with Krishi Vigyan Kendras (KKV) and Research Stations of AAU.

Tech demonstrations, minikit distribution and seed production will be taken up in the following crops:

1. **Finger millet/ Ragi (Kharif):**
2. Fox tail millet/ Kangani
3. Proso millet/ Chena Bajra

A brief description along with cultivation economics of these crops is provided below:

1. **Finger millet/ Ragi (Kharif):** Finger Millet, also known as Ragi is important millet grown extensively in various regions of India and Africa. Its scientific name is *Eleusine coracana*. It ranks sixth in production after wheat, rice, maize, sorghum and bajra in India. In India, ragi (finger millet) is mostly grown and consumed in Karnataka, and to a limited extent in Andhra Pradesh, Tamil Nadu, Odisha, Maharashtra, Uttarakhand, Goa and Assam. It has different names in local languages. In India finger millet is commonly called by various names like ragi (in Kannada, Telugu and Hindi), also Mandua/Mangal in Hindi, Kodra (Himachal Pradesh), Mandia (Oriya), Taidalu (in Telangana region), Kezhvaragu in Tamil, Marua in Assam etc. The per ha cost of cultivation of finger millet (ragi) is about Rs 6000 per ha. The cost of cultivation of kharif ragi as per studies by IIMR was around Rs. 33,316/ha. The average productivity of ragi in Assam is around 600 Kg per ha. Considering that ragi will be sold at MSP of Rs 33.77 per Kg, the revenue accrued through sale at MSP will be $600 \times 33.77 = \text{Rs } 20262$. So the net revenue is $20262 - 6000 = \text{Rs } 14262$.

2. Fox tail millet/ Kangani

3. Proso millet/ Chena Bajra

A.4: Farm Machinery: Mechanization in the production side aspects will be a cross cutting focus area. It is planned that following machines will be procured and provided to the demo farmers/ farmer groups in the initial years but once the FPCs are formed (3rd year), FPCs themselves will procure the machines following community procurement guidelines (borrowed from APART):

a) *Sprinkler systems:* Sprinkler systems are particularly useful in dryland areas where water is highly scarce. As most millets are dryland crops, sprinkler systems would be very useful for irrigation. Govt of India scheme subsidy like PMKSY-PDMC will be exploited, as a part of convergence, to provide sprinkler irrigation systems to millet farmers/ groups.

b) *Seed cum fertilizer drill:* A seed drill is used for sowing of seeds in lines. Line sowing enables many intercultural operations mechanically, thus reducing time and labor requirement.

c) *Intercultural equipment:* Intercultural operations like weeding are facilitated if the crop has been sown in lines.

d) Any other need-based equipment/ materials with approval of DAO

Note: A beneficiary contribution of 15% (can be a combination of bank loan and beneficiary's own share) and Mission contribution of 85% has been proposed in the production side machinery. Larger machines may be kept with local KVKs/ Research Stations under AAU, till the FPCs are formed (to ensure safety of the machines). After formation of FPCs, the machines will be transferred to FPCs through an undertaking. The FPCs would also be able to rent out the machines to other farmers at suitable rates so that funds for maintenance charges of machines can be accrued. In such cases, the FPC will maintain record of machines rented out, rented to whom, time period of renting, income accrued and utilization of such income, if any. Machine usage logbooks shall be updated daily. Support of KVKs under AAU will also be obtained in training of millets farmers/ FPCs on millet production and post-harvest machinery.

A.5: Cropping system demos with pulses: In a quest to diversify the Assam's Agriculture from rice-based cropping systems, it is proposed that 10% of technology demos will be taken up with cropping systems approach involving pulses. Most of the

pulses are low water requiring crops, so are millets. This will also ensure better acceptance of the field interventions among the farmers. With the advent of short duration varieties, it would be possible to fit three crops instead of two within a year, thus providing better realizations to farmers. Further this can help transformation of Assam agricultural systems by shifting the focus to high value and high nutrition produce including millets. Possibility of conducting some of these demos under organic certification will be explored.

6. COMPONENT-B POST HARVEST MANAGEMENT, VALUE ADDITION, PROCESSING AND RECIPE DEVELOPMENT

B.1: Post harvest demonstrations on drying and quality preservation: Most of the millets are dryland crops and are adept to low moisture conditions. However, Assam being a highly humid state, criticality of proper drying in case of millets cannot be ignored. One of the oldest methods used for preservation of millets and other food products to increase their shelf life is **drying**. The protocols for such post-harvest demonstrations will be developed in consultation with Indian Institute of Millets Research (IIMR), Indian Institute of Food Processing Technology (IIFPT), Central Food Technological Research Institute (CFTRI) etc.

B.2: Post harvest machinery: Since the major focus will be on quality preservation and nutritious products development, it is planned to provide post-harvest machinery like dryer, thresher and pulverizer. Since moisture content in field crop produce is an issue in Assam, distribution of driers to farmers on community basis would be very helpful in obtaining quality produce. Thresher is used for threshing of the harvested crop and ensures better quality grains. Similarly, pulverizer serves for grinding and flour making which can go into preparation of many other products. Flour as such can also be sold in the market.

Initially one set of machines (15 nos i.e. 7 in the first year and 8 in the second year) will be procured and provided to KVKs (for model demos). After formation of FPCs (third year), machines will be procured by FPCs themselves following community procurement guidelines (borrowed from APART). FPCs will contribute 15% (may be a combination of own contribution + bank loan) in procurement of machines while the remaining 85% will be contributed by the Mission. FPCs can also rent out the machines to other farmers. This will also help in accruing an additional income to FPCs which can be used for maintenance of machines. Upon accrual of sufficient income, the FPCs can buy additional machines depending upon quantum of millets produced and aggregated by the FPC member farmers.

B.3: Static storage facilities: Small storages of 500-1000 MT capacity will be provided to millets FPCs depending upon the size of FPC and quantum of aggregated produce. Further, it is proposed that a 15% beneficiary contribution will be obtained in order to

ensure better ownership and maintenance by the FPCs. However, in order to expedite the process, to have a decentralized approach and to ensure better community participation FPCs themselves may be allowed to do the procurement (community procurement) process whose success has been established in earlier Project of Govt of Assam i.e. Assam Agricultural Competitiveness Project (AACP) and ongoing Assam Agribusiness and Rural Transformation Project (APART).

B.4 Storage: Looking at the fact that majority of farmers in Assam are smallholders it is proposed that small storage bins will be provided to FPCs. Being small in size they can be used by individual farmers within the FPCs. Initially, before formation of FPCs, 15 nos (7 in first year and 8 in the second year) will be procured by the Mission and kept with KVKs as model demo pieces. In the third year FPCs will procure 450 storage bins, followed by 150 in fourth year, 75 in fifth year, 100 in sixth year & 50 in the last (7th) year following community procurement guidelines. A beneficiary contribution of 40% has been proposed in case of storage bins. The major advantage of storage bins is that these are portable and can be transported from one place to other.

B.5 Nutritious millet products and recipe development fund: A number of nutritious products can be developed from millets. These include **flour, biscuits, cookies etc.** Flour can be used for making many other products. Biscuits and cookies which are used as snack items usually consumed with tea/ coffee. Other products include **bread, bun, extruded snacks, flakes etc. Pasta, vermicelli, cake etc.** are the millet products which are popular among children & youngsters and are highly relished by them. Baby foods is another product segment in which millets find application. **Millets energy bar** can be used to *address the problem of malnutrition among the poor pre-school and school going children.*

In the PM POSHAN Scheme (earlier Mid Day Meal) under the Sarva Siksha Abhiyan of Elementary Education Department, as a pre-condition only hot cooked meals are to be supplied to the school children of Class 1 to 8, the said fund could also be used for new recipe development. In the Poshan Abhiyan under the Social Welfare Department's supplementary nutrition program, in the Take Home Ration (THR) category mainly rice, peas Banana/ vegetables etc. and Rice and mixed pulse based micronutrients energy dense foods are provided to the beneficiaries which includes children of age group of 6 month to 3 years and pregnant Women and Lactating Mothers while in Hot Cooked Meals (HCMs) category, beneficiaries include children of age group of 3 years to 6 years

wherein Hot Cooked Meal (HCM) is provided to the children in the *Anganwadi* Centre by the *Anganwadi* Centre Management Committee as per the approved menu which includes *Khichiri* , *Suji Halwa* , *Rice Kheer* , *Rice vegetable Pulao*, *Suji Upma* and egg , seasonal fruits etc. *Any start ups/ innovators coming up with new recipes for such products with millet as an ingredient, can also be supported by the said Fund, as per pre-defined criteria.*

An amount of Rs 250 lakhs each in 2nd and 3rd year has been parked towards nutritious millet products and new recipe development fund. The fund can be provided to **food entrepreneurs (existing and start up), food business/ companies** etc. to develop new/ innovative millets based nutritious products/ recipes. Need based support of agribusiness incubators, Assam Agribusiness Growth Lab (AAGL) under APART, NEST, Guwahati Biotech Park, NEATHUB etc. will be obtained to support, mentor and handhold such beneficiaries as per pre-decided Mission terms and conditions. In other words, these entrepreneurs can be incubated at any of these business incubators. *Some of the enterprises in APART's Industry Associations can also be encouraged to take the benefit of the scheme.*

7. COMPONENT-C: MARKET LINKAGES

C.1: Millets based FPC formation & support: The objective of this sub-component is to organize the producers groups, established into Farmer Producer Companies (FPCs) and develop and strengthen their capacity and skills to more effectively link to input and output markets. FPCs improve the bargaining power of farmers both for buying the inputs as well for selling the outputs. In addition, bulk procurement of inputs can be done on wholesale rates thus accruing a lot of savings to the farmers. Professional management of the affairs of FPCs would translate into actual revenues and profits to the farmers. It is proposed that each FPC would have around 400 member farmers with around 20-25 smaller groups, each group having 20-25 farmers. Since formation of FPCs is a long drawn process, the work on farmer mobilization, trainings, need assessment etc. would start in the first year itself but set of 20 FPCs would be registered with product aggregation, processing, joint marketing etc. by the third year. Another 10 FPCs would come up by fourth year. Hence, a total 30 FPCs would be set up under the Mission. *Some of the existing FPCs formed under APART or other schemes which are growing millets or interested in growing millets will also be enrolled into the Program, after proper due diligence.* This will help early rollout of the millets based FPCs program under the Mission.

C.2 Common Service Centres (CSCs) with FPCs: Common Service Centres (CSCs) are common aggregation and pooling hubs set up by the FPCs for cleaning, grading and sorting of raw produce. Secondary processing facilities can also be put up by the FPCs depending up potential and feasibility. FPCs will contribute 15% in setting up the CSC (civil works, machines) and remaining 85% would be contributed by the Project as grant in suitable tranches. The 15% contribution from FPCs will comprise of bank loan and their own contribution. The procurements for setting up CSCs will be done by the FPCs themselves following community procurement guidelines (to be issued by the Directorate of Agriculture). In other words, the CSCs are conceived as small scale aggregation places owned, managed and operated by FPCs. Grants for CSCs will be released on the basis of business plans submitted by the FPCs. These CSCs will better enable FPCs to undertake various activities such as bulk purchase of inputs for sale to individual members, marketing of produce, grading and quality control, and enhancing access to distant and higher value markets and bypassing existing market inequities. The benefits to the members of FPCs are expected to be higher prices through the combination of larger critical mass of saleable produce, thereby providing economies of

scale, savings in transaction costs, and strengthened negotiation positions, coupled with the added value achieved through primary grading and packing. It is expected that 20 CSCs would be set by 4th year and another 10 in the 5th year.

All FPCs will be members of Industry Associations (IAs) formed under APART. Some of the promising and interested existing FPCs will also be enrolled into the Mission. As per the need, these FPCs can supply to the processing enterprises in the local Industry Association, if they are processing millets.

The dried, clean raw produce in case of finger millet (ragi), sorghum (jowar) will also be facilitated sale at Minimum Support Price (MSP). For the year 2021-22, the MSP of selected millet crops for Kharif Marketing Season 2021-22, is provided below as per the notification of Directorate of Economics and Statistics, Department of Agriculture, Cooperation and Farmers' Welfare, Ministry of Agriculture, Govt of India:

Sl	Commodity	Minimum Support Price (Rs/quintal)
1	Jowar-hybrid	2738
2	Jowar-Maldandi	2758
3	Ragi (finger millet)	3377
4	Bajra (pearl millet)	2250

Expected revenue from sale at MSP: The productivity of finger millet (ragi) in Assam is 674 Kg/ha. The year-wise area under finger millet demonstrations, production and revenue accruals is shown below:

Sl	Year	Area (ha)	Production (MT)*	Revenue (Rs Cr)**
1	2022-23	450	303.3	1.02
2	2023-24	600	404.4	1.37
3	2024-25	750	505.5	1.71
4	2025-26	900	606.6	2.05
5	2026-27	1050	707.7	2.39
6	2027-28	1200	808.8	2.73
7	2028-29	1350	909.9	3.07
	Total	6300	4246.2	14.34

*Considering a productivity of 674 Kg/ha; **Considering an MSP of Rs 33.77 per Kg. However, in actual MSP will increase every year.

C.3 Buyer Seller Meets (BSMs): The objective of Buyer Seller Meets (BSMs) is to bring the buyers and sellers of agri commodities on the same platform so as to understand

each other's requirements in terms of quantity, quality, time of availability and price of agro commodities. Finally the BSM should lead to business linkages and ultimately smooth closing of maximum number and value of deals between the buyers and sellers. BSMs will be organized at District level and would target potential buyers, FPC members farmers, logistics service providers, packaging solution providers, bankers and other stakeholders.

C.4 Value Chain Schools (VCSs): Value Chain Schools (VCS) is a participatory action learning process that involves farmer groups in agricultural value chains. It focuses on the equitable and effective inclusion of smallholders in marketing/value chain development, rather than on the operation of the productive on-farm activities as a business. As part of capacity strengthening, VCS comprises of a series of group-based experiential learning activities over a production-marketing cycle while interacting with other value chain actors and stakeholders. VCS aspires to a more profitable, equitable and pro-poor farm business environment through market-oriented, climate-smart innovations that enhance trust, coordination, and collaboration among women and men farmers and with other chain actors, leading to greater empowerment and more sustainable livelihoods of targeted farm households. The formation of VCSs would start from 3rd year and continue upto 5th year.

C.5 Product Exhibitions: Product exhibitions are a good way of showcasing the creations of farmers in terms of products prepared through CSCs and VCSs. Product exhibitions will not only show case and demonstrate the diversity food products prepared from millets but will also act as a platform for exchange of information on various aspects of millets value chain among the stakeholders and also help negotiate trade deals between FPCs and buyers. Apart from buyers and support service providers, such exhibitions will be open for general public (consumers) as well wherein direct feedback of consumers may be obtained on the products as well the products can be retailed out to them. Cooking shows, taste reviews and organoleptic events will also be part of such exhibitions. It is planned that 15 product exhibitions will be organized at District level in the second year. In the third year 40, fourth year 45, fifth year 15, sixth year 20 & in seventh year 20 product exhibitions will be organized.

8. COMPONENT-D: ENSURING BETTER NUTRITION, HEALTH & DISEASE FREE ASSAM THROUGH MILLETS

D.1: Distribution of millets based products in rural areas:

(i) Mobile outlets: To economize on the time and space, mobile outlets will be used for distribution of millets based food products in rural areas. These outlets will be fabricated in a customized manner to enable display of products and making window payments (cash/digital). Tasting provision will also be kept for select products. Such mobile outlets will also be used as a tool for advertisement and publicity of the scheme so more and more awareness is created and maximum people in the rural areas can get the benefit of the scheme. It is planned that in the first year, 10 mobile outlets will be introduced which will go on increasing in every year and a total of 280 mobile units will be launched till seventh year. Till the FPCs are formed these mobile outlets will be provided to local youth through a competitive scheme against the proposals. An agreement will be signed with the District Agriculture Office cum PD ATMA for proper usage, maintenance and management of the mobile outlet. The rates to be charged for various products will be decided in consultation with the Directorate of Agriculture. Each mobile outlet may be given a certain target for coverage of number of households & quantity to be sold. Incentives may be provided to the entrepreneurs who sell higher quantities beyond a particular threshold. It is also suggested that the weekly routes and trip timings for mobile outlets may be defined to cover maximum rural population in a systematic manner. Round trip routes would be helpful. On each route, two mobile outlets may be deployed one going in the clockwise direction and other in the anticlockwise direction so that each rural household gets an opportunity twice to buy the products.

(ii) Awareness creation: Awareness will be created about the scheme as a whole and rural mobile distribution initiative in particular in various ways. A total of 2800 campaigns have been planned till seventh year. Nutritional benefits of millet products will be highlighted in such campaigns. Leaflets on proper cooking, storage, nutritional value and health benefits, use before date etc. will be distributed to the rural households to impart optimal benefits out of the scheme. The external body surface of the mobile outlets will also be used as a publicity platform and will be specially designed. The display may be changed on regular intervals.

Through the mobile outlets, it is planned that mainly the millet based products prepared by FPCs will be sold locally i.e. within district. Starting with 100 MT quantity

of products to be sold in the first year, 300 MT in second year, 400 MT in the third year, 800 MT in fourth year and 1000 MT in fifth year, 1500 MT in sixth year and 2000 MT in the last year. Few free samples may be distributed initially in each locality to create traction towards the initiative. The cost on this activity will be mainly towards supply free samples and transportation cost. These costs will be met out by FPCs from the revenue accruals due to sale of products. The products could include ready to cook items like ragi flour as well as ready to eat items like biscuits, cookies etc.

D.2: Millets in mid-day meal scheme:

(i) Awareness creation in schools: Awareness will be created about the scheme in the schools through training of students & staff, distribution of literature, showing small videos including stories on health benefits of millets. Apart from this, wall paintings in schools will also be made on importance of millets in children's diets. Agreements will be made with school administration to have a half an hour session with the students just before mid-day meal, on importance of millets, their nutrition and health benefits, role in balanced diet etc. *This will be done in collaboration with Sarva Siksha Abhiyan under the Elementary Education Department which implement the Mid Day Meal (MDM) scheme (now PM POSHAN).*

(ii) Supply to schools: In collaboration with the Department of Elementary Education and *Axom Sarba Siksha Abhiyan* Mission, distribution of millet products in mid-day meal scheme will be taken up. As hot cooked meals only are to supplied to school children (Class 1 to 8), millet raw materials for preparing these meals will be supplied to schools by FPCs locally (within district) ensuring that the products comply all quality, hygiene and nutritional standards and specifications as prescribed. Sample testing and reporting for the products to be supplied will be done beforehand. In order to economise on the logistics cost, products as per pre-defined menu with sufficient choice will be supplied to schools from the nearby FPCs. Initially, since the quantities available may be low, supply to schools may be done once in a week or 15 days (weekly or fortnightly millets based menu) or pilot scale supplies may be done in few of the districts. Till the FPCs & CSCs are established, raw products may be aggregated from the individual grower farmers, processed at locally available facilities in the private sector and made available to the schools.

D.3: Millets nutrition in adolescent, lactating women and pre-school children (including in Anganwadis)

(i) Nutrition camps for women and pre-school children: Nutrition camps will be done in rural and semi urban areas for women (particularly adolescent

and lactating) and children importance of healthy and balanced diets, benefits of inclusion of millets in their diets. This can be accomplished through focus group discussions in the villages and small towns as well as distribution of literature, showing small videos including stories on health benefits of millets etc. It is planned that around 1000 nutrition camps will be completed over the mission period of seven years.

(ii) Supply to Poshan Abhiyan (Social Welfare Department): Under the Poshan Abhiyan, nutritious food products are supplied to pre-school children (6 months to 6 years) in Anganwadis and at households. The scheme also covers adolescent girls, pregnant women, lactating mothers. As the amount of nutrition to be provided through the food products has already been laid down under the scheme, the products to be supplied from the Assam Millets Mission (AMM) will be complying to these specifications. Sample test reporting shall be ensured before supply of products. The key expenditure will be on packing, supply of free samples, transport etc which will be recovered from the sales revenue accrued to the FPCs from supply of millets based products. Initially, as the quantities available will be small, it is envisaged that only 100 MT products will be supplied in first and second year which increase to 200 MT in 3rd, 4th, 5th years and again taper towards the end of the Mission i.e. only 100 MT each will be supplied in the sixth and seventh year of the mission.

Summary of initial activities (to be carried out in first six months): The mission is likely to be officially launched and grounded from April 2022. The following is the list of key activities to be accomplished in the first six months of inception of the Mission-

1. Recruitment of contractual staff
2. Setting up of the Governing Body for the Mission
3. Setting up of the Millet Cells at the Department and Directorate
4. Setting up of the State PMU
5. Setting up of District Millet Cells
6. Holding the first meeting of the GB, Cells, SPMU
7. Accounts opening, setting up the fund flow mechanism
8. Reporting structures, mission guidelines, protocols etc
9. On-boarding of the technical assistance agencies/ knowledge partners
10. Procurement of office equipments
11. Technology demonstrations of the Kharif millet crops (Finger millet/ Ragi)

9. COMPONENT-E: ADMINISTRATION, OPERATIONS, GOVERNANCE, TRAINING & CAPACITY BUILDING

E.1: Governing Body for the Assam Millets Mission (AMM): A Governing Body will be constituted for the Assam Millets Mission with the following proposed structure:

1. Agriculture Production Commissioner – Chairperson
2. Secretary, Elementary Education Department- Member
3. Secretary, Social Welfare Department (Women & Children)- Member
4. Director, Agriculture, **Member Secretary**
4. Managing Director, Sarva Siksha Abhiyan- Member
5. In-Charge, PM POSHAN (earlier MDM Scheme)- Member
6. In-Charge, Poshan Abhiyan- Member

Invited Members

7. DG-ICRISAT or his nominee
8. Director, Indian Institute of Millets Research (IIMR), Hyderabad
9. Director, National Institute of Nutrition (NIN), Hyderabad

Two Special Expert invitees/ Subject Matter Experts as decided by the Chairperson

The Governing Body (GB) will take policy decisions on the matters relating to Assam Millets Mission (AMM), carry out regular reviews and monitoring of the Program and guide the mission towards smooth implementation etc. The GB will meet at least once in six months.

E.2 Core Millets Mission Committee (CMMC) in participating administrative Departments: A Core Millets Mission Committee (CMMC) will be notified in each of the participating administrative Departments. The proposed composition of the CMMC is as below:

1. Senior most Secretary of the Department – Chairperson
2. Secretary- Member
3. Director- Member Secretary
4. Invited Experts (as required)

E.4 Millets Mission Cell (MMC) at the Directorates: For operational matters at State level in each of the participating Directorates, a Millets Mission Cell (MMC) will be set up in each of the implementing Directorates. The proposed composition of the Millets Mission Cell (MMC) is as below:

1. Director- Chairperson
2. Nodal Officer (not below the rank of Addl. Director)- Member Secretary

3. Assistant Director or equivalent officer dealing with Crops- Member
4. Invites experts- as required & decided by the Chairperson

E.5: Project Management Unit (PMU) at State level: A Project Management Unit (PMU) in the Directorate of Agriculture will be set up. **Director, Agriculture will be the head of the State PMU.** The PMU will also have a Nodal Officer not below the rank of Additional Director. Additional Govt officers depending up subject expertise will be a part of the SPMU. The concerned Scientist/ Professor will be invited member to the meetings of the SPMU. The SPMU will have the following proposed structure:

1. Director, Agriculture- Chairperson
2. State Resource Officer, PM POSHAN (Elementary Education) - Member
3. State Nodal Officer- Poshan Abhiyan (Social Welfare) - Member
3. Nodal Officer (not below the rank of Addl Director) - Member Secy
4. HOD, Food and Nutrition, AAU- Member
5. Senior-most Millets Scientist, AAU- Member

Invited members

6. Senior-most Scientist on major millets, ICRISAT- Member
7. Senior Agronomist, IIMR, Hyderabad- Member
8. Senior Scientist (dealing in millet based products), NIN, Hyderabad- Member

Two Special Expert invitees/ Subject Matter Experts as decided by the Chairperson

The SPMU will be supported with the following contractual staff hired from the market on competitive basis:

(i) Team Leader: An experienced and seasoned professional with at least 15 years of experience in food/ nutrition industry. Experience of having worked with similar schemes/ Projects will be an added advantage. The ideal incumbent would be at least a Masters in Agriculture/ Food Science/ Nutrition & Dietetics etc.

(ii) Domain Specialists: Domain Specialists will be hired in the areas of **(i)** millets agronomy, **(ii)** post harvest management, **(iii)** agricultural marketing, **(iv)** food and nutrition. Each Domain Specialist will have 10 years of professional experience in his/ her domain area and at least a Masters in relevant subject.

(iii) Cross Cutting Experts: Cross Cutting Experts will be engaged in areas like **(i)** Procurement, **(ii)** Finance & Accounts, **(iv)** Social Safeguards **(v)** Environment Safeguards. Each domain expert will have at least 5 years of professional experience in the relevant area and a Masters in relevant subject.

(iv) Support staff: Support staff like Office Assistants, MIS Executive, Accountant will be hired to support the Specialists, Experts and Team leader. They will have at least 3 years of professional experience in the relevant area and a minimum Graduate.

SPMU will be responsible for overall implementation of the Assam Millets Mission in the State with necessary direction, guidance, monitoring of the district level implementation.

E.4: District Level Millets Cell: A millets cell will be established at District level with the following staff & office provisions-

A district level millets cell will be set up in the priority 15 Districts with the following proposed structure

1. Deputy Commissioner- Chairperson
2. District Agriculture Officer cum PD ATMA- Member Secy
3. Head, KVK- Member
4. Chief Scientist, Agriculture Research Station of AAU in the District- Member
5. District Head- PM POSHAN (Elementary Education Deptt)- Member
6. District Head- Poshan Abhiyan (Social Welfare Deptt)- Member
7. Two invited Subject Matter Experts as decided by the Chairperson

The District Millets Cell (DMC) will be supported by the following contractual staff:

(i) Millets Extension Expert (MEE): 15 Millets Extension Experts will be hired for each priority District. MEE will have at least five years of experience in agricultural extension, agri inputs sector or related areas. The ideal incumbent would be at least a Masters in Agriculture.

(ii) Millets Marketing Expert (MME): 15 Millets Marketing Expert (MME) will be hired for each priority District. MME will have at least five years experience in agricultural (output) marketing preferably millets/ cereals or other non perishable products. The ideal incumbent would be at least a Masters/ PG Diploma (min two yrs duration) in Agribusiness, Agricultural Marketing, Agricultural Economics or a closely related field. In case sufficient candidates from above-mentioned streams are not available, then candidates with PG in Agriculture may be considered.

(iii) Furniture & office equipment: The Districts Level Millets Cell will be augmented with basic furnishing like tables, chairs, computers/ laptop, printer, scanner for staff, communication, file cabinets, cupboards, minimal basic furnishing of office premises along with printing stationery, office consumables etc.

(iv) *Operational expenses:* for TA/DA and office running expenses, an amount of Rs 2 lakhs per district has been earmarked.

E.3: Exposure visits: Exposure visits will be arranged to institutes/ organizations of national and international importance like Indian Institute of Millets Research (IIMR), Hyderabad and International Crop Research Institute for the Semi Arid Tropics (ICRISAT), Hyderabad and its branch centres in other countries. In due course of time, other similar institutes/ organizations may be targeted for exposure visits. It is planned that total around 300 persons will be covered in national exposure visits and 10 people will be covered in international exposure visits.

E.5: Trainings: Trainings form an important part of Projects like this and also determine the success of the Program. Trainings will be conducted on

- (i) Scientific package of practices in millets
- (ii) Post harvest management and value addition in millets
- (iii) Millets and millet products marketing for FPCs

Support of relevant resource organizations will be obtained on conduct of above-mentioned trainings

E.6: Millets and pulses business conclave: This will be mega event conducted at State level each year which will bring together the stakeholders in the millets value chain including input suppliers, FPCs, traders, processors, policy makers, administrators both from the public and private sector to enhance the performance of millets value chain. An exhibition on the side lines will also be arranged to show case the millet products from the initiative. Relevant supply tie ups between FPCs and bulk buyers/ processors will also be forged during the business conclave. An amount of Rs 25 lakhs is proposed to be parked each in 2nd, 3rd, 4th, 5th & 6th year for millets and pulses business conclave.

E.7: Millets Knowledge Bank (MKB): Millets Knowledge Bank (MKB) will be an integrated platform for all knowledge resources on millets. MKB would showcase millets production techniques, cultivation technologies, and best farming practices in millets as pool of knowledge from research findings, learning and media resources, and in-country projects etc.

To facilitate easy access to information, MKB Assam would highlight the step-by-step Production Stages from pre-planting to post production management, Decision Tools, and Agronomy Guides to help people make informed farming decisions.

MKB Assam would serve to address the biggest challenge in millets value chain development by supporting fast and effective transfer of technologies from the

laboratory to the farmer's field. Technical support of relevant resource organizations like IIMR and ICRISAT etc. would be obtained to develop MKB. In addition, a specialized agency may be engaged for development of MKB. It proposed that a sum of Rs 150 lakh each year is parked in 3rd, 4th, 5th, and 6th year while Rs 100 lakh is parked in 7th year.

10. FUNDING & FUND FLOW ARRANGEMENTS

The total year-wise, broad head wise fund requirement for the Assam Millets Mission is shown below:

		Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7		
SI	Activities	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	Total	% of total
A	Market & Nutrition Supportive Production	386.24	536.3	654.36	846.86	914.98	1024.04	1133.1	5495.88	27.49
B	Post-Harvest Management, value addition, processing and recipe development	116.59	382.96	1252.00	642.00	37.75	44.50	23.50	2499.30	12.50
C	Market Linkages	0	37.50	590.00	1382.50	675.00	60.00	60.00	2805.00	14.03
D	Ensuring better nutrition, health & disease free Assam through millets	95.00	175.00	270.00	350.00	430.00	495.00	575.00	2390.00	11.95
E	Administration & Operations, Training, capacity building, knowledge mgt	926.65	863.65	1019.65	1027.65	1021.65	1026.65	918.9	6804.8	34.03
	Grand total	1524.48	1995.41	3786.01	4249.01	3079.38	2650.19	2710.5	19994.98	100.00

The allocations shown in yellow shall be fully funded from APART, i.e. all activities in the first two years and Administration & Operations, Training, capacity building, knowledge mgt in the third year will be supported from APART. From APART an allocation of around Rs 45 Cr is available as per World Bank's approval. APART's contribution is tapering in the third year as the Project is closing in Sep. 2024.

Sources of funds: The following is the source-wise fund allocation plan

Sources of funds	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Total	% of total
APART	1524.48	1995.41	1019.65	0	0	0	0	4539.54	23
GoI Schemes	0	0	691.59	1699.604	1231.752	795.057	1084.2	5502.203	28
State Govt (SOPD)	0	0	2074.77	2549.41	1847.628	1855.133	1626.3	9953.237	50
Total	1524.48	1995.41	3786.01	4249.01	3079.38	2650.19	2710.5	19994.98	100

Government of India Schemes to be leveraged:

A. Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP) under RKVY

Under the INSIMP Schemes (RKVU) support available for:

1. Technology demos
2. Seed production
3. Post harvest and value addition
 - a. Establishing Centres of Excellence
 - b. Installation of pre processing and processing small units
4. Awareness campaigns (media and publicity)
5. Technical assistance (handholding support) through contractual manpower
6. Monitoring and reporting etc

B. Post-harvest value addition, enhancing domestic consumption, and for branding millet products nationally and internationally as per union budget announcement 2022 (to be covered under RKVY)

Under the scheme support is available for

1. Post harvest management, value addition, processing and recipe development
2. Market linkages
3. Better nutrition, health & disease free Assam through millets

10. LEARNINGS FROM OTHER STATES/ GOI SCHEMES

- A. **Odisha Millets Mission:** Govt of Odisha has taken a Special Programme for Promotion of Millets in Tribal Areas of Odisha to address the malnutrition among children and women which had emerged as one of the greatest health and development challenges. The initiative is inspired by the second sustainable development goal i.e. ending all forms of malnutrition by 2030. This Special Programme for Promotion of Millets in Tribal Areas of Odisha, also referred to as Odisha Millets Mission (OMM), was launched in 2017. The programme works through four verticals — production, processing, marketing and consumption — with a unique institutional architecture where the government, civil society and academia work together by complementing and supplementing each other. The objective of the programme is to help conserve biodiversity, bring about greater climate resilience and to achieve better nutritional outcomes.
- B. **Work done by ICRISAT:** International Crop Research Institute for the Semi Arid Tropics (ICRISAT) has millets as one of its mandate group of crops. For decades, ICRISAT has been working with farmers in Africa and India to develop crops that can stand drought and, climate-change to improve incomes. Now the Institute is all set to launch a campaign to connect with consumers and find a market for these produce. The Smart Foods campaign will promote consumption of millets in India, Africa and Western countries. It addresses the biggest concerns of farmers who have been wary of cultivating traditional crops like finger millet (ragi), sorghum (jowar) and pearl millet (bajra) for the fear of not finding a market. In this initiative the institute involves food processing firms, local groups and multinational companies in the campaign. The idea is to create products that are attractive and palatable.
- C. **Govt of India initiatives:** At the national level, the Government of India has been promoting the cultivation of millets on a mission mode to achieve nutritional security, following recommendations by a committee headed by NITI Aayog. Indian Prime Minister Shri Narendra Modi dedicated 17 bio-fortified varieties of eight crops, which included two varieties of finger millets and one variety of little millet, on October 16, 2020, on the 75th anniversary of the FAO. As a part of the government's initiative under the National Food Security Act, state governments have been advised to procure millets at minimum support price and distribute them under the public distribution system (PDS). India's National Nutrition Mission, POSHAN Abhiyaan, has also advised state governments to include

millet under large public system delivery channels such as Integrated Child Development Services, Mid-Day Meals etc. While the government and research organizations work towards higher productivity of millets, nutritionists and chefs are contributing towards the promotion of millets by creating unique millet dishes. Promotions are being done on easy ways to cook millets, convenient tasty millet recipes, and word is being spread about their nutritional benefits and environment-friendly qualities among all stakeholders – both at the national and international level. The elements of these initiatives are planned to be replicated as a part of Assam Millets Mission.

11. POLICY INTERVENTIONS FOR MAINSTREAMING MILLETS

For mainstreaming millets, policy interventions would result enhanced area, production, productivity under millets, development of decentralized processing infrastructure, market development and promoting household consumption.

Need for policy interventions to mainstream millets

1. To improve nutritional status: We are facing triple burden of malnutrition and rising epidemic of non-communicable diseases across the social and wealth categories. Promoting consumption of small millets is one of the important means to address this situation.
2. To address climate change related issues: Farmers, particularly in the rainfed segment are facing various climate change related issues, which are drastically affecting their livelihoods. Small millets being able to adapt to a wide range of growing environments and requiring less water, are good candidates for climate change adaptation.
3. To develop markets for small millets: Small millet markets are just emerging and have many imperfections such as price discovery issues, underdeveloped and not standardized infrastructure and technologies, and poor business development. There is need to create a 'level playing field' for small millets when compared to other food grains for their revival. Support has to be provided until the market reaches a threshold level, from where the consumer demand and market forces can drive the growth of small millet products to make them as 'mass products', accessible to major sections of the population.
4. To improve the development impact of public investment on farming: Public investment on small millets pays back many fold as supporting millet cropping and food system results in savings in the public investment made so far such as power subsidies, fertiliser subsidies, etc.
5. Reforms in agri-food-nutrition sector: Introducing small millets in public food programmes can help reforming in terms of the following: **(i)** linking nutrition with local crop diversity, livelihoods and economy, **(ii)** partly reversing the shift from water intensive agriculture to dryland/ rainfed based agri food systems and **(iii)** improving the livelihoods and economic growth of backward dryland regions.
