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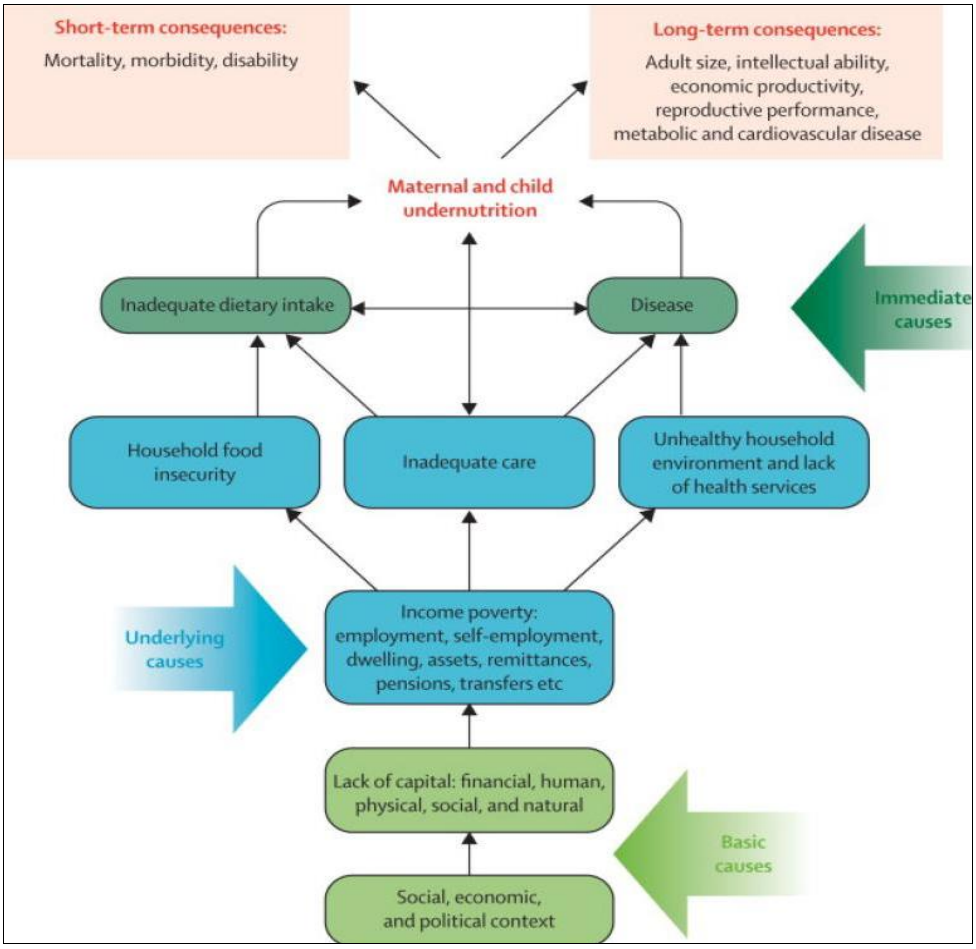
Status of Ragi, Mahua and Maize in Jharkhand for PDS

Vikash Prakash[1]
[1] Student of M.A. Development, School of Development, Azim Premji University, Banglore, Karnataka, India

Abstract
As Anshuman Das, programme manager with Sustainable Integrated Farming Systems (SIFS) programme at the South Asia office of Welthungerhilfe, is a Germany-based non-profit organization, says the introduction of millet management in PDS is urgent to revive the traditional food culture in India. “Indian food was never about just wheat and rice. But the green revolution made it so. If millets are promoted and managed under PDS, it will help revive the traditional nutritional food habits in various parts of the country.” The government of India has declared Millets as ‘Nutri-Cereals’ for production, consumption and trade point of view. According to the Agriculture Ministry,' millets actually hold great potential in contributing substantially to food and nutritional security along the whole country and thus they are not only a powerhouse of nutrients but also are climate-resilient crops and possess unique nutritional characteristics as well as anti-diabetic properties and reduces the postprandial blood glucose level. The government of Jharkhand with the help of ' Jharkhand State Food Commission, Ranchi, (a quasi-judicial authoritative regulatory body constituted under section 16 of National Food Security Act, 2013) 'has also tried to introduce millets (Especially Maize and Ragi) with some another regionally available nutritious grains such as ' Mahua' in PDS, Midday meal and Anganwadi centres. This study is based on Jharkhand's status of production, procurement and distribution in terms of these grains. So, they have conducted the study based on it. This paper also argues that every people have the ' Right to Health' so, they must consume healthy nutritious food. After all, the government of Jharkhand should provide millets and value-added products of Mahua to ensure health security in entitled people. They should also give the initiative to the farmers to grow these grains, without it, implementation of food security act and provide better health facility is not possible.

Keywords: sustainable integrated farming system, the green revolution, nutri-cereals, anti-diabetics, postprandial, blood glucose, climate-resilient, food security act, quasi-judicial authoritative regulatory body, production, procurement, right to health

Introduction
In September 2013, India passed a historic National Food Security Act. This paper examines the potential impact of the two central pillars of this act- expansion of the Public Distribution System and strengthening of the Integrated Child development Schemes- on child and maternal nutrition. I used new data from India Human Development survey as well as my own case study and research. As we know that access to subsidized grain via expansion of PDS and strengthening ICDS has not improved child nutrition, while ICDS seems to be related to lower undernutrition, it has a limited reach in spite of the universalization of the program. The paper suggests that a tiered strategy in dealing with child undernutrition with regionally available food grain that starts with the identification of undernourished children and district and follows through with different strategies for dealing with severe, acute malnutrition, could be more effective than the existing focus on cereal distribution rooted in the NFSA, 2013. Millets and Mahua may be used to enhance their nutrition level. This act is one of the largest safety net programs in the world. This act legislates the availability of 5 kg cereals per person per month at price ranging from 1 to 3 Rs. Per kg to about 67% of India’s population. It contains provisions for nutritional supplementation for young children as well as pregnant and lactating mother via ICDS and through maternity benefit of Rs. 10,000 for all new mothers [1]. This maternity benefit are not yet implemented due to a court challenge but the other two programs involve expansion/restructuring of currently existing programs. The financial cost of this extremely ambitious program is difficult to estimate but some estimates peg it at Rs. 44,000 to 76,000 crore (Mishra 2013) above and beyond the costs already being incurred for various food security programs. In 2013, India ranked 63rd out of 120 in the Global Hunger Index. This index is based on proportion of people wo do not get sufficient calories, proportion of children who are underweight and mortality rate for children under five (von Grember, Headey *et al.* 2013). By some estimates, the economic burden of malnutrition is expected to be between 0.8 to 2.5 % of the GDP (Crosby, jayasinghe *et al*. 2013). One can easily quibble about the size of these estimates but these ey-catching numbers have given impetus to the adevocacy for reducing malnutrition and placed it at the forefront of the national political agenda. We use anthropometric indices are calculated reflecting standarized scores for weight-for-age or height-for-age comparing the index with a reference standard. We can actually measure undernutrition by the framework proposed by UNICEF and a modified version of this framework from the Lancet series on undernutrition is reproduced below.



***Source*:** blank *et al*.> (2008).

Fig 1

Objective

Examine all aspects of introduction of millets especially for Ragi in the PDS in Jharkhand, covering issues related to production, procurement, storage, pricing, and consumer preference. We can use remote sensinsing to identify and establish area and production of selected crop.

Food intake and undernutrition

The whole campaign for food security, child survival and maernal security in India began strongly from 2001. It began with the poorest and most marginalized children in centre and serves the need of woman empowerment also. This led to the famous GOBI (Growth monitoring, oral rehydration, Breastfeeding and Immunization) framework that has influenced the discourse around health and undernutrition over the past three decades. Hunger or caloric deficiency has been at the center of discussion. Declining caloric consumption in India basically in Jharkhand adds to this puzzle. Although incomes have risen sharply in India, per capita caloric consumption has steadily fallen from 2,150 calories per person per day in 1993-94 to 2,020 in 2009-10 in rural areas and from 2,071 to 1,946 in urban areas (National Sample Survey Organization, 2012). Similiar decline is observed in the data Collected by National Nutrition Monitoring Bureau 2012. This decline in caloric consumption has added urgency to the advocacy for reducing hunger in India. We can see composition of food continues to remain a bottleneck for improved nutritional status. A large number of studies have documented the importance of micronutrients like iron, vitamin A, zinc and calcium in shaping maternal health, child birth weight and child undernutrition. This issue is perticularly relevent in India since studies have documented high prevalence of Anaemia in Indian mothers and children that seems persistent in spite of economic growth. National Family Health Survey of 2005-6 records 56% of the women as being anaemic up from 52% in 1998-99. A similiar increase in anaemia is observed among children with about 78% at least mildly anaemic (Haemoglobin level of < 10 g/dl) in 2005-6 compared to 74% in 1998-99. NFHS-III notes that only 49% of the women consume milk daily while that number is even smaller for fruits, only 13%.

But if we shall calculate calories in the grain which I have choosen and which can be used as alternative of cereals has higher potential to serve as 'Greater Food' and these are regionally available also. Let's begin it with Maize

Table 1: Nutrition summary: maize

Calories 86	**Fat 1.18g**	**Carbs 19.02g**	**Protein 3.22g**
There are 86 calories in 100 grams of Yellow Sweet Corn.			
Calorie breakdown: 11% fat, 76% carbs, 13% protein.			

***Source*:**//www.fatsecret.com/calories-nutrition/usda/yellow-sweet cornportionid=59083&portionamount=100.000

The composition of maize endows it with many health benefits. The high fiber content prevents constipation and colorectal cancer. The antioxidant betacryptoxanthin prevents lung cancer, while lutein prevents age related vision loss. Antioxidants slow cognitive decline and conditions like Alzheimer's. Vitamin C boosts immunity and fights infections, while the presence of vitamin E gives maize anti-aging properties. Thiamine is required for boosting memory, cognitive functions and nerve health, and pantothenic acid is essential for energy, as it is linked to carbohydrate, protein and lipid metabolism. Folate is an essential requirement, especially during pregnancy. The phosphorus helps to maintain normal growth, kidney function and bone health. Magnesium boosts the latter, as well as regulates the heart rate. Finally, maize lowers LDL (Low-density lipoprotein) cholesterol and guards against cardiac diseases, diabetes and hypertension. Biotin or Vitamin B7 give nutritional benefits to maize, since the deficiency of this vitamin in the body affects the state of the skin and hair.

Maize is one of the most important cereal crops of the world and contributes to food security in most of the developing countries. In India, maize is emerging as third most important crop after rice and wheat. Its importance lies in the fact that it is not only used for human food and animal feed but at the same time it is also widely used for corn starch industry, corn oil production, baby corns etc. Production of maize in India has increased at a CAGR (Compund Annual Growth Rate) of 5.5 per cent from 14 MnMT in 2004-05 to 23 MnMT in 2013-14. Production of maize in India is dominated by Andhra Pradesh and Karnataka which contributes to ~38 percent of the total production.

Consistent quality

Buyers do not get consistent quality of maize especially in terms of the grain size and moisture content, especially during the khar if season. Rejections occur frequently due to maize not being of the required quality /specification

Shortage

During the months of July – September the crop stocked by traders starts to diminish and maize procurement becomes difficult in this period. Bihar is one of the key maize suppliers during the Rabi season; however there is a need for adequate storage and drying mechanism

Maize pricing

Maize prices have consistently gone up during the past few years and maize, being a major raw material for both starch and poultry feed, margins are affected since there is a lag between increase in maize pricing and transfer of increased price to the end user

Intermediaries

Due to the fragmented land holdings of farmers and requirement of cash payment, buyers are not being able to procure maize directly from farmers and are incurring additional cost of intermediaries

Farmer issues

Inability of the farmers to spend on good quality seeds, fertilizers, pesticides and fungicides etc and persistence of traditional cultivation practices in the interior and remote areas affects the yield as well as quality of maize produced in the country.

Post-harvest losse

Maize suffers heavy post-harvest losses estimated at 20-30 per cent. The main underlying factor is the lack of farmers' education, coupled with poor infrastructure and handling for transportation, improper storage and drying facilities, resulting in wastage and pilferage

Quality hybrids

There is a need for varieties and hybrids of different maturity groups namely, long, medium and short duration hybrids and varieties with high yield potential suitable to various agro-climatic regions. Drought, pest and insect tolerant or resistant hybrids and varieties suitable to different agro-climatic zones are required.

Whereas Ragi has also greater potential to serve as our daily needed calories and nutraceutical substances because it has all the given property in only 100 g. The humble super millet, packed with fibre and calcium, is extremely beneficial due to its umpteen health benefits.

Table 2

Calories	**328**	**Sodium**	**5 mg**
Total Fat	1 g	Potassium	0 mg
Saturated	0 g	Total Carbs	72 g
Polyunsaturated	0 g	Dietary Fiber	12 g
Monounsaturated	1 g	Sugars	0 g
Trans	0 g	Protein	7 g
Cholesterol	0 mg		
Vitamin A	0%	Calcium	0%
Vitamin C	0%	Iron	0%

***Source*:** /www.fatsecret. Com/ calories-nutrition/usda/ragi-madua =59083&portionamount=100.000 *Percent Daily Values are based on a 2000 calorie diet. You're daily

It can help protect your heart health, improve the digestive system, lower the risk of cancer, boost respiratory health, detoxify the body, optimise the immune system, increase energy levels, and improve muscle and nerve health. Ragi also leads to stronger bones, stronger teeth and helps to prevent iron deficiency. The millet is filling and wholesome and recommended for all age groups. Add it to a meal every day to increase fibre in our diet. To ensure that the calcium and iron are easily absorbed, sprout ragi at home or buy the easily available flour made from sprouted ragi. The millet is extremely versatile and can be used in a variety of recipes, including idlis, dosas, rotis, porridge, pancakes, cookies and even bread. Ragi is one of the best non-dairy sources of calcium when compared to any other grains. According to the National Institute of Nutrition in India, 100 grams of Ragi contains 344 mg calcium. Calcium is critical for healthy bones and teeth and prevention of osteoporosis - a disease which weakens the bones. It helps in controlling Diabetes. Ragi works wonders for maintaining young and youthful skin. Vital amino acids like Methionine and Lysine present in it make the skin tissues less prone to wrinkles and sagging. Ragi is an

excellent source of natural iron and thus a boon for anemic patients and also for those with low haemoglobin levels. Once ragi is allowed to sprout, the Vitamin C levels tend to increase and lead to easy absorption of iron into the bloodstream. Regular consumption of Ragi is highly beneficial in dealing with conditions of anxiety, depression and insomnia. The high amount of dietary fibre combine keeps the stomach full for a longer and prevents unwanted cravings.

Introduction of millets in PDS/ study of Karnataka government

Apart from hunger, micronutrient malnutrition, especially among pregnant and lactating women, children and adolescent girls is widespread in India, as reiterated by the latest report of the National Family Health Survey. The National Food Security Act, 2013 (NFSA)1 seeks to: "provide for food and nutritional security in human life cycle approach, by ensuring access to adequate quantity of quality food at affordable prices...."p1. The Act sought to bring nearly 75 per cent of rural and 50 per cent of urban population under the public distribution system (PDS) 2. Public distribution of foodgrains began in India in 1942 and was institutionalized in the 1960's with the establishment of the Food Corporation of India in 1965. Currently, India runs the world's largest public food distribution system that delivers largely rice and wheat through designated Fair Price Shops (FPS) throughout the country. However, it is well established that rice3 and wheat alone are not adequate to meet the nutritional requirements of these segments. The NFSA provided for the distribution of millets, referred to as 'coarse grains' in the PDS.

Given that millet is a naturally nutrient dense agricultural produce, making it available through the PDS will enable poor and vulnerable populations access the cereal and could help address the problem of hidden hunger. Effective implementation and delivery of millets under the PDS can have far reaching implications for addressing the problem of malnutrition. Even though the NFSA provided for distributing millets through the PDS, only the state of Karnataka (4) seems to have introduced this. Chhattisgarh has pioneered a model of local procurement and local distribution of pulses, also a nutritionally dense food, through the PDS while Tamil Nadu has been distributing pulses through the PDS for the last decade; but Karnataka is the first in millets.

We can take the example of whole mechanism of production, distribution and procurement of millets in Karnataka. It may be the relevent model for milltets distribution in Jharkhand. I do not have the whole authentic data of present Jhankand's

Production but I have some data which I gathered from my field work is necessary to mention here but I will mention it in case study.

Procurement commenced in the year 2013-14 but there was limited success. During 2014-15, the GoK tasked the Karnataka Agricultural Price Commission (KAPRICOM) to study the issue and suggest remedial measures to increase procurement of millets. KAPRICOM found that over the last two decades, area under these crops were steadily declining and profitability vis-à-vis other competing crops had fallen sharply, leading to grower apathy towards these crops. To remedy the situation, the key recommended actions were:

- Increase minimum support price (MSP) to ragi and jowar to provide at least 20%-30% mark-up5 over cost of cultivation as estimated by KAPRICOM
- Reduce incentives being given to maize and cotton, which were the chief competitors to ragi and jowar
- Aggressively promote millets as an appropriate crop to adapt to changing climatic situation in the state
- Invest in carrying out research to produce new varieties that will provide high yields, thus making it attractive to farmers to grow the crops.

Experience of farmers in selling under MSP procurement in Karnataka has been given below in table;

Table 3: Farmers' experience: Price, payment time & market distance

Crop		**Ragi, Mandya, Tumkur**	
Price Rs. (per/qtl)	Open-	1707	1785
	Govt.-	2130	2050
Payment duration (days)	Open	1.46	1.21
	Govt.-	47.36	39.65
Market distance (km)	Open-	NA	13.21
	Govt.-	11.02	16.48

***Source*:** Primary survey 2016-17

Price is consistently higher under MSP procurement, but number of days taken by the farmer to receive payment is very high under government procurement as compared to selling in the market. In fact, this was the main complaint that farmers had about selling to the government - interminable delays in receiving payments.

Quality of Ragi in PDS- Most of the respondents rated the quality of ragi and jowar as 'Fair" or "Good", but nearly 20% felt that jowar was "Very Good" while about 15% felt that ragi was "Poor" and even "Very Poor".

Accordingly, the GoK increased the MSP from Rs.1500/quintal for ragi and Rs.1800/quintal for jowar (maldandi6 variety) in 2013-14 to Rs.2000/qtl and Rs.2300/qtl for ragi and jowar respectively in 2014-15. Procurement of ragi increased to 1.36 lakh MT (metric tons) and 6839 MT for jowar in 2014-15. Encouraged by this, the MSP for ragi was further enhanced in 2015-16 to Rs.2250/qtl and procurement increased to 1.5 lakh MT. However, following the failure of jowar crop, there was no procurement of jowar in 2015-16. The objectives of this study were framed against this background.

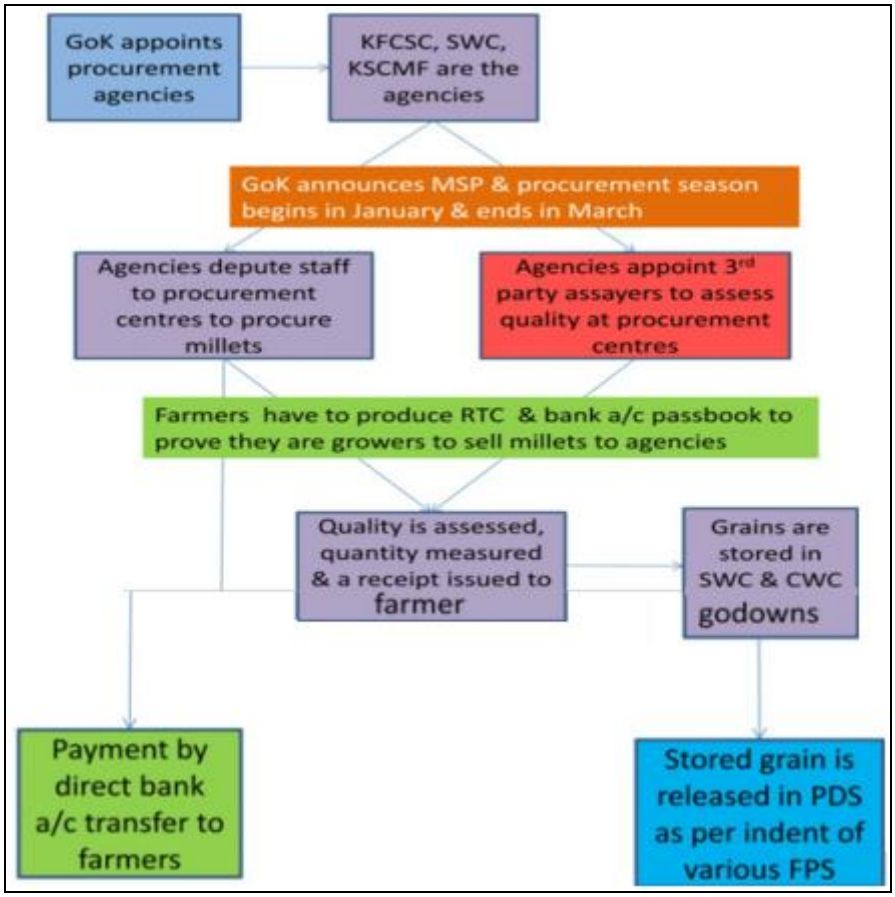


Fig 2: Millets in PDS: GoK Approach

In Jharkhand, It is an irony that soil health, which is the basic requirement for agriculture has been neglected by the farming community, more particularly the small and marginal farmers basically due to insufficient extension service. This has given lot of stress on the soil reserves of nutrients on account of wanton use of fertilisers without soil testing. While soil health care would have to be given utmost care in any agriculture development plan, it is envisaged that each farmer need to be given " Soil Health Card" for his land which would contain all required information relating to pH factor, nutrient status, soil depth, texture and structure, organic matter part from micro-biology, which would help the farmer in making suitable application of desired fertilisers and micronutrients. Soil health card to be issued to all farm holdings, however looking at the task involved it is proposed to cover 20% of the holding during the plan period. The soil of Jharkhand is favourable for Millets and Mahua.

Why millets in public distribution system?

However, with the introduction of other commercial crops, improvements in the irrigation facilities, low market demand, these millets substantially lost their acreage, despite being well adaptive to rainfed agriculture and nutritionally superior. Besides, the introduction of rice at a highly subsidized price through PDS also changed the people's choice of crops as their food security is mainly taken care of by the safety net. As A result of this, the crop landscapes as well as food habits have undergone a significant change pushing these millets to few tribal pockets and marginal soils.

Crop: Coverage Area (As in 2005-06)
Rice: 57%
Wheat: 2.45%
Maze: 7.66%
Pulses: 12.02%
Fruit: 0.28 lakh ha.
Vegetables: 2.25 lakh ha.

Despite the continued declining trend in millet acreage, the recent developments on productivity of different crops in India as reported by National Rainfed Agricultural Authority in the last decade (2001 to 2009) showed an optimistic outlook for millets with productivity of coarse cereals (millets + maize & Barely put together) at 4.8% compared to the total food grains (3.31%) for the same period. Among the individual crops, highest productivity was achieved with Bajra (4.22%) followed by Jowar (3.66%), maize (2.87%), small millets (2.63%), Ragi (1.37%) compared to the declined growth under assured irrigated situations for wheat (0.98%) and rice (1.92%). These results are a clear indication that, a clear shift of focus is required in our approach and need to promote the production and procurement of the alternative grains to rice and wheat to meet the growing food requirements of the increasing population. It is in this context, we propose to bring millets into the fold of PDS through

decentralized production and procurement, especially from rainfed locations. This decisive step will not only help in broadbasing the food basket in the PDS but also help in supplying the more nutritious foods through the safety net programme. Besides, their inclusion will help in bringing in private investment into the processing and value addition to mainstream these nutritious millets in the regular food systems of the state. The proposed decentralized production and procurement of millets will help in cultivation of the low water and other input requiring millet crops in the rainfed locations thereby reducing the stress on the declining ground water resources and power consumption in drawing up the ground water for irrigating these crops.

Local production, procurement and local distribution – Is this better?

Oftentimes, it is suggested that local production, procurement and local distribution of foodgrains instead of a centralized procurement would be a better and more efficient way of delivering grains to the poor. As part of an experiment in decentralized PDS, 2009. Organized procurement and distribution of millets through Self Help Groups (SHGs) in a few villages. SHGs procured millets from farmers and sold it a subsidized rate the rural poor. The difference in the procurement and selling rate was met through a subsidy provided by the project. The price of ragi was set higher than that of rice and did not attract many buyers until the price gap between rice and ragi was lowered. The experiment was discontinued once the project and the subsidy ended.

PDS seeks to deliver about 20-30 per cent of the total millets consumed by a PDS cardholding household. To do this, the government is procuring millets at a price that is substantially higher than the currently prevailing wholesale price. To meet the entire PDS requirement, it needs to procure nearly 20-40 per cent of the total production of millets. Coupled with this scale and an increased MSP, the move is bound to have an upward impact on the retail price of the millet in the open market. This was already evident during the survey for ragi; wholesale price which was languishing at Rs.800-1200/qtl had risen sharply to Rs.1800/qtl in villages in response to an MSP of Rs.2250/qtl. Finger Millet requires Climate & Soil: It is heat loving plant and for its germination, the minimum temperature required is 8-10 degree C. A mean temperature range of 26-29 oC during the growth is the best for proper development and good crop yield. Finger millet can be grown on a wide adoptability to different soil from very poor to very fertile and can tolerate a certain degree of alkalinity.

Gumla

The ineresting thing which I found about the productivity of Mandua and Maize in Gumla district is mentioned below.

Table 4

Mandua	1125 Ha (area)	7810 Qtl	7.10 Qtl/ha
Maize	5300	71990 Qtl	14.50 Qtl/ha

***Source*:** Krishi Vigyan Sansthan, Gumla, Jharkhand

Issue Price/ Subsidy

The millets were supplied at Rs. 3/- less per kg on the market price. Care was taken that the Supply cost was Rs. 3/- less than the cost of each grain in the local market. Accordingly the subsidy cost was decided irrespective of the purchasing cost, transport cost, loading unloading cost etc. Total subsidy per kg of millets supplied is as follows:

a. Cost subsidy on actual price (Rs. 3/- less than local market price) (Rs): 3.00/-
b. Total Loading & Unloading charges (From trader to MLS point 8 paisa + MLS point to fair price shop 8 paisa per Kg) (Rs): 0.16/-
c. Transportation charges (From trader to MLS point Rs.1/- + MLS to Fair price Shop Rs. 0.7/-) (Rs): 1.07/-
d. Commission to dealer /kg (Rs): 0.30/- Total subsidy per kg (Rs): 4.53/-

Responsibilities of dealer

Grains will be released against the DD submitted in advance to MMS. Responsible for handling and storage loss beyond 2%.Show the left over quantity against the supply and this left over grain to be returned to MMS. Maintaining SALE REGISTER in the shop. Cooperating with APDAI project in providing the required data/ information regarding the study Publicity of the programme in the village

Entitlements

2% additional quantity of each type of grain will be given towards handling losses (without charging) Commission @ 30 paise per kg of each grain sold will be given from APDAI. MMS will supply the sale registers

Emerging framework for promotion of millets

The pilot experience has provided a basic proof of concept of the feasibility of inclusion of millets into a decentralized Public Distribution System. Millets can be produced, procured and distributed locally within a district. The process is much easier in case of millets like Ragi (finger millet), Bajra and Sorghum where processing is not involved. Decentralised operations in this pilot experience, has made the process quicker, less transport intensive and minimizes the storage requirements. The procurement operations can also be decentralized to community based organizations. It has also generated local employment and incentives to the farmers. The elasticity of supply is also substantial as the local demand at a remunerative price has given spurt in allocation of productive agriculture land and irrigation to millets. This may eventually lead to increase in area under millets and diversity in crop systems. The following broad elements of a framework are emerging for a comprehensive program to revive millets in consumption and crop systems. An additional 15 kgs of millet grain in PDS allocation will bring in several nutritional benefits to the poor who are depending substantially on PDS rice.

Let’s talk about Mahua also. The tree is also of great commercial importance. The flower of the mahua tree is used by the people to make liquor. The liquor produced is famous for consumption among local people. It has been observed that various regions of the country has its own variety of liquor. The government needs to promote the product by creating a Brand. This will help in its commercialization and also will create employment for rural people. Although the government

of India and various states have put a ban on liquor looking it as a social evil, but it has many value-added products. Madhuca longifolia, is its scientific name commonly known as mahua, is a tree found mainly in the central and north Indian forests. It is a fast growing tree that possesses evergreen quality. It is adapted to dry environments, being a prominent tree in tropical mixed deciduous forests in India. The oil extracted from its seeds is used for the care of the skin, to manufacture soap or detergents, and as a vegetable butter. The seed cakes obtained after extraction of oil constitute very good fertilizer. The flowers are used to produce an alcoholic drink. Several parts of the tree, including the bark, are used for their medicinal properties. It is considered holy by many tribal communities because of its usefulness. The mahua flower is edible and is a food item for tribals. They are used to make syrup for medicinal purposes.

Table 5

Calories	210	Sodium	15 mg
Total Fat	15 g	Potassium	0 mg
Saturated	2 g	Total Carbs	16 g
Polyunsaturated	0 g	Dietary Fiber	4 g
Monounsaturated	0 g	Sugars	6 g
Trans	0 g	Protein	3 g
Cholesterol	0 mg		

***Source*:** https://www.myfitnesspal.com/food/calories/generic-mahua-115454415 This every thing found in only one piece of Mahua.

Processing of Mahua occurs at three levels:

- Drying: collectors dry the flowers before they sell
- Stocking: traders stock in cold storages
- Brewing: brewing of liquours household/bhatti/large brewer level.

To quote a premier Mahua trader, production of Mahua flower may vary between two to four lakh tonnes. However
Comparing the national production data, it may be an over estimation. But it speaks of the variations [11]. Similarly price varies between Rs 12 to 24 in the retail market. Production in neighbouring states especially Orissa also influences prices. But these swings are not always in favour of the primary producers. These fluctuations in production and prices make availability of storage facility/infrastructure in an accessible place and at affordable cost a critical constraint.

Observation/focused group discussion in Gumla, Ghaghra and Bishunpur and its inferences

The forest cover in the state is 22, 9777 km2 which is 28.28% the states's geographical area. Mahua (Madhuca Indica) belonging to the family Sapotaceae, is of those multipurpose forest tree species i.e. Food, Fodder, and fuel. Therefore present experiment was conducted on the "Assessment on production and sales of Mahua produce in Gumla district". Gumla district Contains 1 sub-divisions (Gumla Sadar), 12 Community Development Blocks as well as 3 towns (Gumla, Ghaghra and Toto). Gumla is the principal town of the district. It is headquarters of the district and Gumla Sadar sub-division. C.D. Blocks [12] of Gumla sadar Sub-division, viz., Bishunpur, Ghaghra, Chainpur, Dumri, Raidih, Gumla, Sisai, Verno, Kamdara, Basia, Palkot and Albert Ekka (Jari). The present Gumla district with a population of 1025213 according to 2011 Census, is divided into 12 Community Development Blocks comprising 948 villages (inhabited- 942, uninhabited - 6) and 3 town (1 statutory and 2 CT). With 3.10 percent of the total population of the State comprised within the district, Gumla is a small sized district and ranks 16th in the state in order of population. The population of males and females are 514390and 510823with density of population in 2011 is 191 (per sq. km.) of the district.Proportion of rural and urban population: 2011 of Gumla district are 93.7 (rural) and 6.3 (urban).

The study was conducted in month of May this year at three markets, i.e, Bishunpur, Ghaghra and Gumla itself. The survey was done in the villages namely Bhitar Sarka, Bahar Sarka, and Bishunpur. These villages are situated near by the forest and their livelihood depends upon the collection Non-Timber Forest Products (NTFP) produces from the forests. In the abovemarket people of these villages are sell their Mahua produces. The study area was surveyed through household survey with the help of predesigned questionnaire using simple random sampling technique with 15% sampling intensity. Taking the household sampling unit. Data collection is done through market surveys, field surveys, and household surveys. The various parameters for collection of data used in this survey was, a socio-economic status of the villagers in which people involved in collection and marketing of various Mahua produces, family size and structure, annual family income, and contribution of Mahua in household income, collection and marketing of Mahua produces by the villagers in which Mahua produces used by local households, seasonal availability, market value or opportunity costs of the items, quantities of Mahua produces gathered from, forest at household level etc. Potential of adjoining forest area with respect to production of Mahua produce was studied. The total number of Mahua tree species found in the study area was 956. The marketwise study of of number of family was 11 found maximum in Bishunpur market (1263) followed by Ghaghra market (1008) and least was found in Gumla market (104) itself. May be I did not reach at the exact place. The average one way distance travelled for Mahua flower collection by the villagers of Bishunpur market from 0.2 km to 3 km by the villagers of Ghargra market is from 0.2 km to 2.5 km and by the villagers of Gula market is vary from 0.1 km to 2.0 km. The average monthly income of villagers of Bishunpur market is 3600.00, the average monthly income of villagers of Ghagra market is 3050.00 rupee. The total quantity of flowers and seeds collected (qtl) in a season by villagers varied from 178.50 qtl to 238 qtl for flowers and 23.80 qtl to 39.75 qtl for seeds. The sale price of Mahua varied from Rs 15.00 to 22.00 and Rs, 10.00 to 15.00 for seeds in studied area of market. In market mahua produces are sold only on every Saturday. In case of value-added mahua produces only liqor, mahua oil and mahua cake. And only liqor was prepared from from mahua flower. Mahua oil used for self-consumption for cooking meal not medicinal use. Lastly, the mahua cake used as a fertilizer.

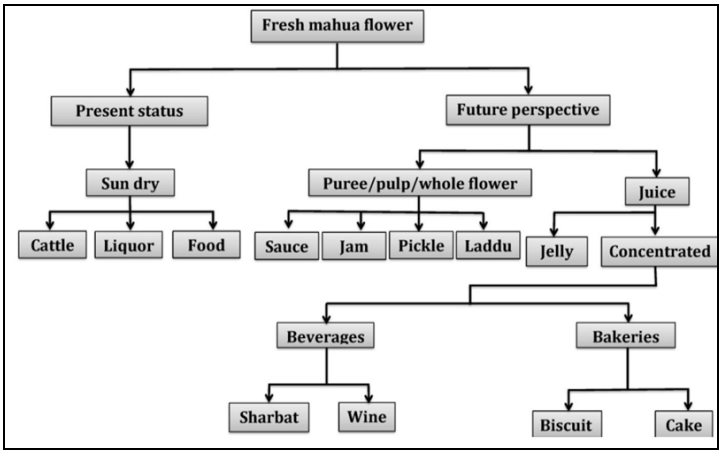


Fig 4

The interesting observation is that, collectors who sell flowers again become consumer and purchase mahua flower from retailers/whole sellers/ middle men on high price also.

But whereever I visited I did not find any people from villages or city who were knowing but this value added product of Mahua except Agricutural Scientists and some social activists who were working in this field. So, there is need of awareness about its product. We should not make it accused of all social evils in our society.

Recommendation

An additional 15 kgs of millet grain in PDS allocation will bring in several nutritional benefits to the poor who are depending substantially on PDS rice because 90% of its cost is beared by central governmental.

A planned geographical spread in the introduction of millets into PDS may be a good strategy – starting with presently millet consuming areas and expanding to areas which have shifted recently and to the new areas. Millets should be introduced into the PDS in a comprehensive package that includes – consumer awareness campaign, production enhancement- including appropriate system for easy access to seed, price incentive and local procurement, storage and supply systems. Piece meal introduction would not serve any purpose.

Millets introduction into PDS should be taken up in a phased manner – starting as an additional allocation over and above the allocation of rice/ wheat and gradually substituting rice to certain percentage, if required.

The system works the best in a Decentralised Public Distribution System – where the operations of enhancing production, procurement and distribution are localized (within a block or at the most in a district).

This will also enable locally preferred millets to be part of the PDS and opens up diversity within the PDS in the country. Introduction of processed millets like Rawa will increase the consumption substantially. Decentralised PDS will open up several employment and business opportunities locally.

Abbreviations

KFCSC- Karnataka food and civil supplies corporation Ltd.
SWC- State Warehouse Corporation
KSCMF- Karnataka state co-operative marketing federation
BAU- Birsa Agriculture University
NHB- National Horticulture Board
NHM- National Horticulture Mission
MoFPI- Ministry of food processing unit
MLS- Mandal level Storage
MMS- Monitoring Mechanism Services
DAI- Karnataka Draught Adaptation Initiative
OWS- Other Welfare Schemes

Reference

1. http://indiacode.nic.in/acts-in-pdf/202013.pdf
2. Ibid page 3 Section 3(2)
3. Longvah T, Ananthan R, Bhaskarachary K, Venkiah K. Indian Food Composition Tables. National Insititute of Nutrition, Indian Council of Medical Research, Department of Health Research, Ministry of Health and Family Welfare, Government of India, 2017.
4. Karnataka has been distributing finger millet (ragi) in south Karnataka and sorghum (jowar) in north Karnataka through PDS since, 2013-14.
5. Swaminathan MS. had recommended that farmers should be assured at least 50% margin over cost of cultivation to make a crop attractive for the farmer to continue cultivating it.
6. Only maldandi, a traditional variety of jowar (called bili jola or white jowar) that is grown in. north Karnataka during rabi is preferred as a foodgrain. The hybrid variety grown during kharif is not eaten in the area. Therefore, the GoK procures only this variety and announces a separate MSP for it.
7. http://www.kfcsc.kar.nic.in/kfcscdd/pc_rep_dist.aspx?id= BAXI%2fIL7WX4%3d (providesdata on procurement of ragi and jowar during 2015-16)
8. http://kfcsc.kar.nic.in/kfcscdd/dist_ret_pt_lift_stat_t.aspx (provides data on distribution of ragi/jowar)
9. http://www.vikalpsangam.org/static/media/uploads/Resources/alternative_pds_at_dds_sriniv as_thapa_2004.pdf
10. http://www.dhan.org/smallmillets/docs/report/Introducing_millets_into_Public_Distribution_System.pdf
11. Yogesh Kumar, *et al*., Mahua- A nature reward to tribal ecosystem of central India, International Journal of current microbiology and applied sciences ISSN- 2319-7706. 2017; 6(4):1519-1526. www.ijcmas.com