

## **ANNEX: 2.8**

### **Report on Public Policy Analysis and Change Aimed at Policy Environment Conducive to Small Millets in South Asia**

IDRC Project Number: 106506

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Arthacharya Foundation (AF), Sri Lanka  
Local Initiatives for Biodiversity Research and Development (LI-BIRD), Nepal  
Watershed Support Services and Activities Network (WASSAN), India  
Canadian Mennonite University (CMU), Canada

#### **Location of Study**

India, Sri Lanka and Nepal

#### **Reporting period**

March 2011 to August, 2014

Part of  
**Revalorizing Small Millets in the Rainfed Regions of South Asia**



Foreign Affairs, Trade and  
Development Canada

Affaires étrangères, Commerce  
et Développement Canada



**IDRC | CRDI**

International Development Research Centre  
Centre de recherches pour le développement international

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## Acronyms

AICSMIP	: All India Coordinated Small Millets Improvement Project
CIFSRF	: Canadian International Food Security Research Fund
DFATD	: Department of Foreign Affairs, Trade and Development
DHAN	: Development of Humane Actions
FGD	: Focus Group Discussion
GOI	: Government of India
IDRC	: International Development and Research Centre
ICDP – CC	: Integrated Cereals Development Programmes in Coarse Cereals
ICDS	: Integrated Child Development Scheme
INSIMP	: Initiative for Nutritional Security through Intensive Millets Promotion
LI-BIRD	: Local Initiatives for Biodiversity, Research and Development
MGNREGA	: Mahatma Gandhi National Rural Employment Guarantee Act
MSP	: Minimum Support Price
NADP	: National Agriculture Development Programme
NADP	: National Agriculture Development Programme
NFSB	: National Food Security Bill
NGOs	: National Government Organisations
NHM	: National Horticulture Mission
PDS	: Public Distribution System
RESMISA	: Revalorizing Small Millets in rainfed regions of South Asia
RADP	: Rainfed Area Development Programme
RRA	: Revitalizing Rainfed Areas
SMACs	: Small millet and associated crops
TNAU	: Tamil Nadu Agricultural University
WASSAN	: Watershed Support Services and Activities Network

# Public policy analysis and change aimed at policy environment conducive to small millets in South Asia

## 1 Introduction

Need based public policies are developed by countries to address the critical developmental issues to ensure overall development. Despite priority to address hunger and poverty issues through those policies, food and nutritional security is of growing concern, particularly in developing countries owing to lack of dietary diversity and less access to balanced diet. Small millets which can perform well in marginal environments, yet having superior nutritional qualities than the current staple food rice and wheat can offer a solution to such nutritional security issues. Small millets though played an important role in dietary habits of people traditionally in the rainfed regions of South Asia, got vanished from the food basket of people due to various reasons.

Some of the main underlying barriers which have limited—and still are limiting—the production and consumption of small millets are (1) Lower or near absence of production support when compared to the support enjoyed by other crops, (2) Near lack of reach of improved methods of production and technologies, (3) Lack of appropriate post-harvest processing technologies for small millets except finger millet, (4) Competition from other market friendly remunerative crops, (5) Changes in preference patterns in consumption moving away from them (Sanskritisation), mainly due to inclusion of only rice and wheat into the Public Distribution System (PDS), (6) Lack of public procurement and marketing support, (7) Absence of public or private funded promotion of millets as a nutritious food category, and (8) Strong industrial demand and consequent attractive farm gate prices crowding out consumption in the area of production.

Amongst the causes for downfall of small millets, historical policy neglect of these crops is an important one. It can be seen that many of the barriers listed above emerge from such policy neglect. Without addressing the policy related barriers not much progress can be made in the promotion of production and consumption of small millets. Present-day willingness of policy makers to focus on millets is encouraging, but caution is needed in the design and implementation of enabling measures. While an equal-level playing field should be created for millets in all respects, this does not necessarily mean replication of monocropping with improved variety/hybrid and fertilizers promotion strategy as employed for wheat and paddy. As noted earlier, small millet cropping systems are part of diverse rainfed ecosystems; they need custom-made location specific approaches.

Revalorizing Small millets in rainfed regions of South Asia (RESMISA) project, an action research project initiated for promoting production and consumption of small millets recognized the importance of policy change for integration of small millets in the mainstream diets and had “Public policy analysis and change aimed at policy environment conducive to small millets” as an important objective. RESMISA project adopted evidence based policy advocacy approach to influence policy and followed the below given process steps for implementing this approach.

- 1. Understanding the policy scenario:** Policy landscaping studies were carried out in the project countries to understand the nature of existing policies related to food and nutritional security in general and those related to small millets in particular.
- 2. Feeding to the process of policy making conducive to small millets:** The project attempted in the following ways to feed to the policy making process at various levels. a) Generating policy lessons from various research activities taken up as part of the project related to conservation, varietal improvement, productivity enhancement, harvest and post-harvest technologies, product development, promotion of consumption and market interventions, b) Undertaking policy studies for generating necessary details for better policy making and c) Innovative use of existing policies: To address the food and nutritional security issues countries already the governments are implementing many schemes like the mid-day meals, ICDS, etc. Pilot studies on including small millets in such schemes were carried out to demonstrate the modalities to the policy makers.
- 3. Networking with stakeholders:** Wider policy change is possible only if all the stakeholders are involved. With this in mind the project attempted networking with various stakeholders related to small millets -farmers, market chain actors, machinery manufacturers, small scale entrepreneurs, food industries, research organisations, government and non-governmental organizations to identify ways for promoting small millets.
- 4. Sharing the policy lessons:** Sharing the lessons learned through above processes to the respective government and other stake holders was attempted through policy consultation meetings and sharing of policy briefs

The different activities done in public policy analysis and the change aimed to create conducive policy environment to promote production and consumption of small millets is shared briefly in this report.

## 2 Synthesis of Results

### 2.1 India

#### 2.1.1 Analysing existing policies

India with varied agro-climatic zones is a land for different type of crops and all the six millet crops focused in the project are grown here. However millets, and particularly small millets, are in a situation of crisis in India. The period between 1961 and 2009 saw a dramatic decline in cultivated area under millets (80% for small millets, 46% for finger millet, 59% for sorghum and 23% for pearl millet); a 76% decrease in total production of small millets and a steep fall in overall millets consumption. Interestingly, during the same time, India is the biggest producer of millets in the world. Amongst the causes for crisis of millets, historical policy neglect of these crops is an important one. It is in this context, a policy landscaping was attempted to get an understanding on the policies that are either directly or indirectly connected to millets.

The study found that only limited policies and schemes explicitly include millets. There are no exclusive Government schemes, projects or programs for small millets. Of the available schemes, the most important ones are Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP) as part of Rashtriya Krishi Vikas Yojana” (RKVY), Rainfed Area Development Programme

(RADP) as part of Rashtriya Krishi Vikas Yojana” (RKVY), and Integrated Cereals Development Programmes in Coarse Cereals based Cropping Systems Areas (ICDP-CC) under Macro Management of Agriculture(MMA). There is lot of variation across the states on how they utilise these opportunities for promoting millets. Further most of the states usually focus on sorghum, pearl millet and finger millet and leave out many of the small millets while implementing these schemes. Discussed below are some of the policy initiatives of Government of India that have scope to link with small millet promotion.

**INSIMP:** Of the schemes mentioned, INSIMP is the only comprehensive initiative to support millets. Launched in 2012 with an allocation of Rs.3000 million under ‘Rashtriya Krishi Vikas Yojana” (RKVY), the scheme supported the districts with millets production clusters (10,000 ha for sorghum and pearl millet, 5,000 ha for finger millet, 2,000 ha for small millets). Demonstrations were conducted in districts with minimum identified areas under millets cultivation but where productivity is less than the National Average Yield. Inputs were provided in the form of production kits supplied free of charge for maximum 2 ha to all farmers from selected units in selected districts. Kits include micro-nutrients, fungicides, (bio) fertilizers, DAP, urea, potash, pesticides, herbicides, etc. Seeds of improved and hybridized varieties (for 0.4 ha) are distributed as well. Seed production was promoted through an incentive for hybrid seeds and High Yielding Varieties (HYVs), of which 75% is passed on to farmers and 25% to seed agencies. Post-harvest technology was promoted through the establishment of three national centres for demonstration and training, through the distribution of processing units for various districts and by organizing capacity building trainings in post-harvest management. Support was provided for state-initiated awareness raising campaigns to stimulate millets consumption. One percent of the funds were made available for different research topics. As part of the scheme, Centers of Excellence for three subgroups were proposed and initiated (Centre of Excellence for Sorghum in Hyderabad, Centre of Excellence for Pearl Millet in Chowdary Charan Singh Agricultural University, Hissar and Centre of Excellence for small millets in University of Agricultural Sciences, Bangalore) to give push for post value addition and post harvest technologies.

While the aims of INSIMP appear to be far reaching, it suffers from lack of causality and balance between its different components, raising doubts about the truly integrated nature of the scheme. Particularly there is poor focus on promotion of millets consumption. In a similar vein, the interventions proposed and implementation modalities appear quite similar to regular agricultural schemes focusing on inputs supply, even though an increasing number of authorities are underlining the importance of new approaches to rainfed farming. As a later development in 2014 Kharif, this INSIMP program was merged with the already existing food security program viz., the National Food Security Mission, as a subgroup (NFSM- Coarse Cereals), but two more coarse grain crops viz., maize and barley being included in the list. Thus though small millets gained a place to be promoted under food security program, they are still at a disadvantage position since they have to fight for their place along with commercial crop like maize for which a better demand exists.

Moreover, the sub programme under NFSM (NFSM- Coarse cereals) though offers farmers inputs like seed, fertilizers on a subsidy basis, the condition that the seeds must be of recently released varieties (in last 10 years in case of straight varieties and 5 years in case of hybrids) is not definitely in favor of small millets. Except for finger millet, much research was not done on other type of small millets and currently only local land races are widely cultivated by people. More than the small

millet, the crops like Maize which already have seen a meteoric growth in their coverage are in a advantageous position to access funds under this sub theme of NFSM- Coarse Cereals. Under these circumstances, either these small millets have to be given an exemption from this rule or crop specific upper ceilings have to be set so that each crop gets their due share in this scheme.

On the consumption part the National Food security Act had included millets under Public Distribution system for the first time and yet not operationalised. Presently only rice and wheat assumes gets distributed widely through PDS. In fact the easy availability of rice and wheat through PDS in processed form, and at a very subsidized rate had negatively influenced the consumption of small millets in the last four decades. The present consideration to include small millet is a welcome move, but it has to overcome the process hurdles in the implementation, including the present production status which is considerably low. Though Minimum Support Price (MSP) is announced for millets, there is no mechanism to procure millets.

More details on the Indian policy landscape is provided in the full paper accessible at [http://www.dhan.org/smallmillets/docs/report/Millet\\_Support\\_Policies.pdf](http://www.dhan.org/smallmillets/docs/report/Millet_Support_Policies.pdf)

### **2.1.2 Policy studies**

A study on “Exploring feasibility of promoting small millets through PDS in Tamil Nadu and Andhra Pradesh” was taken up by Dinesh Moharia, a postdoctoral student from CMU & UM, Canada with the support of DHAN Foundation & WASSAN in India. The premise of the study is that ‘understanding popular perceptions of healthy food and the drivers of those perceptions is essential to the design of successful state-led food security measures’. This study attempted to analyse factors responsible for the shift in consumption of small millets and then examines the potential for reversing the trend. His study revealed that people had adequate knowledge and positive attitude pertaining to the small millets. But the transformation of positive attitude to action was weak due to the lack of government support, non-availability of processed millets, high price of small millets, and availability of cheap rice through PDS. Unless these multiple constraints related to processing technology and access are addressed, increased knowledge and social status of small millets are less likely to enhance consumption. On the other hand policy makers are constrained by higher cost of procuring small millets and lack of political support for diverting financial resources currently allocated for rice and wheat distribution through public systems. This study resulted in three papers which were submitted for various journals and one of the paper is given in Annex-I.

### **2.1.3 Innovative use of existing policies**

#### **(i) Pilot project in ICDS by WASSAN & ARTIC**

A pilot project for supplying the millet cum rice food through Integrated Child Development Scheme (ICDS) was initiated by WASSAN and a local NGO called ARTIC in January 2013 with the collaboration from the Department of Women and Children Development. Under ICDS, day care centres were established by government in rural and urban areas for poor children in the age group of 3 to 6 years. These centres run and feed the children for 25 days in a month and generally offer only rice based food to them. While the rice based food meets the protein and calorie requirements, it misses out the important nutrients and micronutrients. In order to improve the nutritional status of the foods supplied through the programme, WASSAN & ARTIC designed a new food model of supplying 16 days of millet based meal per month and initiated a pilot in collaboration with Department of



Women and Children. This pilot covered 164 children in 12 centres in Srikakulam District. The millet cum rice based menu provided 42% higher proteins, 3.2 times more minerals, 14.5 times higher fibre, 2.6 times more calcium, 5 times higher Iron, 13% more Magnesium and 59% higher Zinc to the targeted children than the regular rice based menu. Procurement was made from the local area and this has resulted in generating interest among the tribal farmers to reintroduce millets in their cropping systems. More details are given in the report accessible at [http://www.dhan.org/smallmillets/docs/report/Introducing\\_millets\\_into\\_Public\\_Distribution\\_System.pdf](http://www.dhan.org/smallmillets/docs/report/Introducing_millets_into_Public_Distribution_System.pdf).

#### **(ii) Pilot initiative in Social Welfare Hostels in Odisha State**

When the ICDS pilot was shared with the District Officials of Malkangiri in Odisha State with the help of Revitalizing Rainfed Agriculture Network partners, they had shown interest to include millets in the feeding programmes and asked WASSAN to suggest the possibilities within the available budget. WASSAN, after studying the feeding patterns and costing, suggested the ITDA (Integrated Tribal Development Agency) to include the finger millet based snack on alternate days which was accepted by ITDA as well as the District Collector.

Thus a pilot was initiated for children staying in the social welfare schools in Malkangiri district. Through this pilot, 1200 students were served with millet based snacks on alternate days from 13<sup>th</sup> November to December 2013. By February 2014, this pilot was evaluated for the acceptance by the students. Based on the feedback, suitable modifications were made and the pilot was scaled up to three blocks from March 2014 covering 4106 students. The district administration is keen to scale this up to entire district for covering all the students studying in the social welfare hostels (28,000 students) in a phased manner. The procurement and supply of the finger millet flour was assigned to the local Self Help Groups to encourage the decentralized procurement as well as to augment local production and procurement of millets.

### **2.1.4 Networking with other relevant stakeholders**

#### **(i) Convergence with INSIMP**

In Andhra Pradesh, WASSAN and its partners (VIKASA, ARTIC and CAVS) tried to network with the mainstream programs to promote the millet production. When the INSIMP programme was rolled out in 2012 in Andhra Pradesh, WASSAN and its partners facilitated convergence of 1500 farmers and 750 farmers under this program in 2013 and 2014, respectively. Besides, 150 farmers were identified and facilitated to obtain the production support from Agricultural University through Tribal Sub-plan. Through NABARD support, VIKASA could supply seeds of improved finger millet variety to 2069 farmers procured from agricultural research station at Vizianagaram.

Besides production, WASSAN through its partners (VIKASA and ARTIC) facilitated the setting up of two small millet processing units through INSIMP and one processing unit through the support from NABARD (National Bank for Agriculture and Rural Development). Two processing units were set up in Dumriguda location and one was set up in the Seethampet Mandal where the ICDS pilot was taken up. The processing unit set up in Dumriguda location was catering to the requirements of the tribal schools in the entire Visakhapatnam district by supplying 10 metric tons of finger millet flour through Girijan Cooperative Corporation.

WASSAN served as a member of the State Nutrition Committee set up by the Government of Andhra Pradesh and visited three states Tamilnadu, Odisha and Karnataka to study the various food models being run in these states to suggest a suitable model to supply more nutritious foods to the children in the Supplementary Nutrition Programs. In the recommendations submitted to the Government of Andhra Pradesh, millets were also suggested as one option to ameliorate the nutritional status of the foods. Besides, it also submitted a memorandum to the Andhra Pradesh Ministerial Subcommittee outlining an action plan for promoting small millets under the Tribal Development Plan to address the issue of malnutrition among tribal women and children.

DHAN has been implementing a State Balanced Growth Fund project along with Department of Agriculture which offered comprehensive support for 200 farmers in Madurai district for small millet cultivation. It also linked 125 farmers with Tribal development sub-plan in Odisha for getting support for small millets cultivation. Kalanjiam Thozilagam Limited, a business subsidiary of DHAN, has initiated two producer companies for small millets in Jawadhu hills, Tiruvanamalai District and Peraiyur, Madurai District in collaboration with Small Farmers Agribusiness Consortium.

DHAN organized a seminar on small millets at the Madurai Symposium, a large bi-annual event attended by development professionals. Many local NGOs, activists, and other stakeholders who attended the seminar expressed their interest in exchanging experiences on small millets. DHAN established relationships with the Revitalizing Rainfed Agriculture (RRA) network and the IDRC-supported CIFSRRF project on small millets at the MS Swaminathan Research Foundation (MSSRF). The relationship with the MSSRF was further firmed up by a reciprocal arrangement to serve on each other's project advisory committee. DHAN also established collaboration with Victor Machines, Salem and AVM Engineering, Salem, Tamil Nadu. These entrepreneurs have the potential to contribute to the development, testing, and scaling-up of post-harvest technologies being developed by the TNAU scientists. DHAN and TNAU participated in an international conference organised by UAS, Dharwad and shared the experiences from the RESMISA project.

DHAN has made a presentation on promoting millets at an exclusive meeting organised by the State Planning Commission, Tamil Nadu, where senior bureaucrats and officials of Cooperation, Food & Consumer Protection Department, Health and Family Welfare Department, Agricultural Marketing and Agribusiness, members of planning commission and other NGOs were present. The proceedings of this meeting are given in Annex-II. Project partners from the TNAU took part in a separate policy consultation organised by the State Planning Commission, Tamil Nadu for promoting cultivation of millets.

### **2.1.5 Sharing the policy lessons emerging from the project with the policy makers**

#### **(i) Policy workshop with State Planning Commission in Chennai, Tamil Nadu**

A policy workshop was organized with the state planning commission members on July 2<sup>nd</sup> 2014 to appraise of the developments on the small millets front in general and on the RESMISA project in particular. During this workshop, different interventions that were promoted under RESMISA and initiatives were presented, so that they could find place in the future planning. The main suggestions / outcomes of the meeting included i) trying out integrated pilots at Taluk level for effectively linking local production and consumption, ii) supporting entrepreneurs on a scale for promoting small millets related enterprises and iii) introducing small millets in ICDS & Amma Canteens. A policy brief

for Tamil Nadu State was prepared and shared to the policy makers. The proceedings of this meeting are given in Annex-III.

#### **(ii) Policy workshop in Bhubaneswar, Odisha**

A policy workshop was organized by DHAN foundation in Odisha State on 17<sup>th</sup> July 2014 on the issue of child undernutrition and feasibility and prospects of doing away with it. Important policy makers of the state department of Women and Child Development were present besides the organizations working on the issue of child undernutrition. This was organized in collaboration with the Xavier Institute of Management, Bhubaneswar. The nutritional issues faced by the children, possible reasons for the same, and means to eradicate them were discussed during the meeting. The initiatives through the RESMISA project, like introduction of small millets based foods into ICDS and Social Welfare schools was also presented during the workshop, which invoked interest among the participants.

#### **(iii) National Consultation on Promotion of Small Millets, Tamil Nadu**

A two days National Consultation on Promotion of Small Millets, was organized on 5<sup>th</sup> and 6<sup>th</sup> August, 2014 at Tamil Nadu Agricultural University in Coimbatore. The initiative, probably the first of its kind brought together the various stakeholders associated with promotion of small millets from farmers, seed companies, aggregators at village level, small and large scale processors of small millet grains, small scale entrepreneurs (ready to cook and ready to eat product makers), large food companies, machinery manufactures (Agro-processing machines and value added product making machines), researchers and development agencies. Intra-stake holder interaction and inter-stakeholder interaction was facilitated so that everyone present understood each other's perspectives, issues, needs and a platform is created for mutual support. A lead paper was also presented on behalf of each stakeholder covering the current status and important issues pertaining to that stakeholder. Suggestions and expectations were shared across the stakeholders and the support needed from the Government was also shared. The participants also shared the need for collective action and suggested few actionable points. The meeting explicitly brought out the real practical issues in promotion of small millets with respect to each stakeholder and also resulted in solid outcomes based on which future course of action can be decided. A detailed note on the outcomes of the stakeholder's consultation meeting is shared in Annex-IV.

#### **(iv) Policy workshop at New Delhi co-hosted by MSSRF and DHAN**

MSSRF and DHAN organized a one day policy workshop at New Delhi inviting the key policy makers on the theme of 'New opportunities for Nutritious foods and Climate Smart agriculture'. During this policy workshop, both MSSRF and DHAN made presentations for select policy makers the policy lessons emerging from their projects. Indian partners also brought out a policy brief "*Small Millets: Big potential*" wherein the policy initiatives needed for enhancing the status of small millets in mainstream diets is delineated and the policy brief can be accessed at [http://www.dhan.org/smallmillets/docs/report/Small Millets Policy Brief Aug 2014.pdf](http://www.dhan.org/smallmillets/docs/report/Small_Millets_Policy_Brief_Aug_2014.pdf)

#### **(v) Sharing workshop in Srikakulam on ICDS pilot**

A sharing workshop was organized in Srikakulam inviting the local groups working in the fields of rural development, education, livelihoods and government officials connected to the implementation of the ICDS schemes. The District Women and Child Development Department head

(Project Director for ICDS) invited the participants and shared about the pilot and stressed the need to include the nutritious millets in the supplementary Nutrition Programmes. Anganwadi teachers, cooks and some mothers' committee members shared their experience on giving millet based menu to children through the Anganwadi centers. They shared that the children relished the millet based menu and the parents too got awareness on the nutritive value of small millets. Later, the publications on millet recipes, folders for school students, and a brochure on the pilot was released by the Anganwadi teachers and cooks. As a part of this meeting WASSAN and ARTIC brought out a brochure (<http://www.dhan.org/smallmillets/images/posters/ICDS.pdf>) on the ICDS pilot "Alleviating Child Malnutrition by Integrating millets into Supplementary Nutrition "An Initiative with ICDS in Srikakulam", which shares the main lessons from the ICDS pilot and how it can be replicated in other areas.

## 2.2 Nepal

### 2.2.1 Analysis of Existing Policies

Finger millet is grown in almost 9% of the total cultivated area in Nepal( 75 % of this is grown in mid hills) and despite being the fourth most important cereal food crop in terms of area and coverage it is neglected by research and extension system in the country. Other small millets foxtail millet, proso millet, barnyard millet and little millet are also highly neglected. There are no any authentic records of area under cultivation of small millets except that of finger millet which shows the seriousness of the situation. So a policy landscaping study was undertaken as part of RESMISA project. This study was designed to compare the investment and efforts given on small millets when compared to rice, wheat and maize research and extension in the country.

The result showed that lecture on small millets (only finger millet) is included only in the undergraduate course in IAAS. No lectures on plant breeding and plant protection were found in the course curriculum on small millets including finger millet. The result also showed that there were a total of 154 publications on the four crops out of which only three were on small millet (all on finger millet). In Nepal Agricultural Research Council (NARC), Hill Crop Research Programme (HCRP) is the commodity programme with the mandate to design and conduct research on small millets. Only three varieties of finger millet have been released by HCRP/NARC till date. Different NARC publications like proceedings, annual reports and journals were scanned to assess the number of publications on rice, wheat, maize and small millets. Among these publications only 6% were on small millets which included finger millet publications in majority.

Similarly, under Department of Agriculture (DoA), Crop Development Directorate (CDD) is responsible for developing overall agriculture extension programme on cereal crops. According to CDD, each year thousands of minikits (seed packet) of rice, maize and wheat are distributed but no minikits of finger millet or any other small millet were distributed until now. But very recently i.e. from 2013, CDD/DoA has initiated finger millet production programme in 24 hill districts which has given some rays of hope for promoting the finger millet cultivation as well as consumption.

Different policy documents were reviewed to assess the level of emphasis given by the government on minor crops including small millets. NARC vision 2011-2030 just indicates that it will emphasize development of high yielding varieties of major cereals including millet. Agriculture Prospective Plan (1995-2015) does not have any provisions to the minor crops and APP is completely silent towards

the promotion and utilization of neglected crops including small millets. Agriculture Development Strategy 2013 also does not speak explicitly on any of the neglected and minor crops. National Agricultural Policy 2004 envisions the sustainability in agricultural production and transformation of agriculture into more commercial and competitive system and does not say anything on minor crops and small millets. Nepal Agricultural Extension Strategy 2007 which basically outlines the mechanisms to accelerate the implementation envisioned by APP does not highlight anything on small millets. Seed Sector Development Strategy (Seed Vision 2013-2025) of Nepal is the only document which clearly prioritizes finger millet research and development. This document is full of hopes for promoting cultivation, commercialization and consumption of finger millet.

All these information vividly point out that small millets have been highly ignored until now. Some rays of hope can be seen in the Seed Vision and the programme enforced by CDD/DoA from this year. More information can be seen in the policy landscaping paper accessible at [http://www.dhan.org/smallmillets/docs/report/2013\\_LI-BIRD\\_Policy\\_Annex%20report\\_RESMISA.pdf](http://www.dhan.org/smallmillets/docs/report/2013_LI-BIRD_Policy_Annex%20report_RESMISA.pdf)

### **2.2.2 Innovative use of existing policies**

#### **(i) Pilot on inclusion of small millet in mid-day meal scheme in schools**

LI-BIRD tried to raise awareness among the school children in the project sites as well as outside the project sites on nutritive value of small millets. In this context, through RESMISA project effort for introduction of finger millet recipes in the school mid-day meal was taken up. School cooks/teachers from 15 schools in the rural areas of the project sites and 15 boarding schools in Pokhara valley were trained in value added finger millet recipe preparation. Currently, 10 schools in the project sites have introduced finger millet recipes in the school mid-day meal while the boarding schools in Pokhara valley are very keen to introduce finger millet recipes in mid day meal very soon. In Jogimara site of Dhading district, eight schools have been linked with BCDC group which supplies the finger millet flour to these schools at a cheaper rate. These schools will need a strong support for a few years for the continuity of the programme.

### **2.2.3 Networking with Stakeholders**

LI-BIRD tried best to engage government staff in different events under RESMISA project activities like Joint field monitoring and visits, RESMISA six monthly meeting, etc. Advance finger millet lines from HCRP were tested in the project sites; seed of released varieties for seed kit distribution were brought from HCRP and pathologists from NARC were outsourced to score diseases in the trials.

### **2.2.4 Sharing the policy lessons emerging from the project with the policy makers**

A policy workshop was organized was organized by LI-BIRD on 15 August 2014 at Kathmandu to share the outcomes of the three years of field research done to promote small millets in Nepal . The main objectives of the sharing workshop were i) To share the key outputs/ outcomes of the research activities of RESMISA project, ii) To share the key achievements made by the RESMISA project in finger millet promotion iii) To make all the stakeholders aware on finger millet research activities ongoing at the national level and iv) To make all the relevant stakeholders aware on finger millet promotional activities at national level. A total of 22 individuals comprising participants from NARC, DoA, NGOs, farmer representatives and LI-BIRD participated in the workshop. Ideas on future

research and promotional activities were the major points of the discussion. The participants have agreed to make joint effort to promote the production, promotion and consumption of finger millet in the following years. LI-BIRD based on its policy analysis and the policy lessons from the research activities carried in the project sites has developed a policy brief ‘Constraints and Opportunities for Promotion of finger millet in Nepal’

([http://www.dhan.org/smallmillets/docs/report/Constraints\\_and\\_Opportunities\\_for\\_Promotion\\_of\\_Finger\\_Millet\\_in\\_Nepal.pdf](http://www.dhan.org/smallmillets/docs/report/Constraints_and_Opportunities_for_Promotion_of_Finger_Millet_in_Nepal.pdf)) and shared the same widely. The policy brief calls for participatory research to improve finger millet varieties, market incentives to promote finger millet cultivation at local level (since Nepal depends on import currently to meet the consumption needs) and integration of small millets in nutritional programs of the government, especially in schools.

## 2.3 Sri Lanka

### 2.3.1 Analysis of existing policies

Post independence importance was given to rice crop to fulfill the gap between production and the requirement, irrigation and settlement schemes targeting paddy production, guaranteed price schemes of paddy have induced the change of food pattern of the rural people. Although the paddy cultivation is the main livelihood of the rural people in the later stage of the 21<sup>st</sup> century. They also cultivated finger millets and other field crops in uplands as shifting cultivation and in home gardens to minimize the uncertainty of the paddy production. However, especially in the wet zone, spreading of plantation crops such as tea, rubber, coconut and cinnamon has reduced the availability of land for subsidiary food crops such as finger millets and other small millets. Under this context, the Arthacharya Foundation initiated *Study of agricultural policies of Sri Lanka with a focus on small millets* to understand the place of small millets in the current policy framework. The paper analyzed the place of small millets in agricultural policy over the years and discussed in detail the existing Government policies and programs on small millets. The study found that no specific policies exist in the current policy regime for small millets and hence non-plantation agricultural policies were taken to understand the current policy support for small millets. The policy neglect led to decline of finger millet area from 93,267 acres in 1955 to 10,077 acres in 2011. The reduction in finger millet area was more after 1975 due the changes in the reduction in the protection levels for import, liberalization, etc. On the other side, consumption of finger millet has been increasing due to its image as a health food and 30 percent of the demand is met from imports from India. No research station was set up in Uva Province where millets are grown. Besides these, the following problems which impede the cultivation and promotion of the millets and needs immediate intervention were identified during the study.

- Low productivity of millets, poor and unorganized input support for millet cultivation and consequent low attention of the farmers resulting in low area and low production
- Many local varieties are vanishing and loss of germplasm.
- Emerging labour shortages in rural area as a consequence of younger generation shifting away from the agriculture sector.
- Poor and unorganized input supply and services
- Underdeveloped marketing, value addition, processing and storage facilities.

- Price volatilities, increased labour costs and cost of cultivation making the imported finger millet from India cheaper than the locally produced
- Post harvesting issues like more impurities in the finger millet and lack of suitable machinery to separate the foreign material in the finger millet
- Non availability of suitable high yielding varieties

More details on the *Study of agricultural policies of Sri Lanka with a focus on small millets* is available on [http://www.dhan.org/smallmillets/docs/report/Agricultural\\_Policy\\_Study\\_Report\\_SriLanka.pdf](http://www.dhan.org/smallmillets/docs/report/Agricultural_Policy_Study_Report_SriLanka.pdf))

### **2.3.2 Networking with stakeholders**

AF has also entered into a MoU with the department of agriculture and Ruhuna University to promote finger millet. An exposure and learning visit was organised for Sri Lankan policy makers to Karnataka by DHAN to understand the advancement in varietal improvement, production practices, processing technologies and product development and the support offered by the state for seed distribution, production, village level processing and distribution through public distribution system. They visited All India Coordinated Small Millets Project at Bangalore, interacted with the farmers and processors, and visited a Women federation in Mandya to understand the above issues.

## **3 Summary and conclusion**

Inadequate policy support was an overarching constraint which contributes to other production, processing and marketing related constraints related to small millets. To know the status of current policies in the project countries and to address this the project attempted the following: 1) Analysing the policy landscape to identify the policy action areas, 2) Taking up policy studies that can feed to the emerging policies, 3) Demonstrating the innovative use of existing policies, 4) Networking with stakeholders for collective action and 5) Sharing the policy lessons emerging from the project with the policy makers.

### **3.1 Analysing existing policies**

Policy landscaping papers were prepared for the three project countries with the focus on millets. These papers analysed the existing Government policies and programs on millets, to promote production, consumption and research on small millets and compared the same with other food grains. It was found that 1) there were no exclusive Government schemes/projects/ programs for small millets, 2) there were only few that explicitly include millets and, 3) even where it was explicitly included, these schemes not fully implemented and funds were underutilized. All the three policy landscaping studies indicated the policy space available for small millets in terms of policies (E.g.: Food Security Act in India, National Agriculture Research Council Vision of 2011-2030 in Nepal and *Mahinda Chintana* 2010) and schemes/programs (E.g.: National Food Security Mission in India and Mission Programme on Minor Crops in Nepal). They also indicated the changes and convergence needed in the existing policies and new policies needed for inclusion of small millets in mainstream diets.

### **3.2 Policy studies**

A study on “Exploring feasibility of promoting small millets through PDS” was taken up by Dinesh, a postdoctoral student from CMU & UM, Canada with the support of DHAN & WASSAN. His study



revealed that people have adequate knowledge and positive attitude pertaining to the small millets. But the transformation of positive attitude to action is weak due to lack of government support, non-availability of processed millets, high price of small millets, and availability of cheap rice through PDS. His study indicates that there is a need of strong policy advocacy for progressing from agenda setting to policy formulation.

### **3.3 Innovative use of existing policies**

**(i) Pilot project on introduction of millets into ICDS menu:** The details are shared in the milestones section. This pilot was showcased and the related policy lessons were widely shared with local stakeholders in the district through a workshop and to wider audience through policy workshops at Tamil Nadu, Odisha and Delhi.

**(ii) Introduction of small millet snacks in schools:** The project partner WASSAN facilitated the introduction of millet based snacks to 4162 students in the government social welfare school hostels in three blocks in Malkangiri District.

**(iii) Introduction of small millet menu in mid-day meals in schools:** LI-BIRD facilitated the introduction of finger millet recipes in mid-day meals to 848 students in ten government schools in two districts.

### **3.4 Networking with other relevant stakeholders**

A national stakeholder consultation meeting was organised in India at TNAU, Coimbatore by DHAN for bringing all stakeholders- producers, market chain actors, food industries, machinery fabricators, researchers and development agencies- to a platform and identify ways to collectively address various constraints faced by them. More details are given in Annex 2.8. DHAN worked closely with the State Planning Commission and Department of Agriculture in Tamil Nadu, Central Institute of Agricultural Engineering, and Central Food Technology Research Institute. WASSAN served as a member in the Andhra Pradesh Nutrition Committee and worked with Initiative for Nutritional Security through Intensive Millet Promotion Scheme and NABARD. AF entered into a MoU with the department of agriculture and Ruhuna University. LI-BIRD worked closely with NARC and other stakeholders. The research results of the project were shared with the small millet scientists during the annual meeting of AICSMIP, Japalpur.

In India, Karnataka state was providing better supportive policy environment for small millets. So an exposure and learning visit was organised for three policy makers from Sri Lanka to understand 1) the advancement in varietal improvement, production practices, processing technologies and product development and 2) the support offered by the state for seed distribution, production, village level processing and distribution through Public Distribution System for finger millet. The participants came forward to take initiatives for increasing production and consumption of finger millet in Sri Lanka.

### **3.5 Sharing the policy lessons emerging from the project with the policy makers**

As mentioned earlier policy consultation meetings were conducted in Tamil Nadu, Odisha, Andhra Pradesh and Delhi in India and in Nepal. [Three policy briefs](#) were prepared and widely shared with the policy makers. During these events, policy lessons emerging from different activities of RESMISA project were presented. The important action points suggested were: i) trying out integrated



support initiatives in production clusters for effectively linking local production and consumption, ii) supporting entrepreneurs and processors for promoting small millets related enterprises and iii) introducing small millets in Public Food Programs and Government Canteens.

## **4 Way forward**

Small millet consumption is currently limited by the multiple constraints which are reinforced by low technology application and poorly developed markets. What is needed is a comprehensive and integrated development strategy aiming at demand stimulation, increasing production, developing local processing infrastructure and local market development on an extensive yet location-sensitive scale. Such a development strategy should at least include the following general objectives:

1. Increasing local demand for consumption of all small millets, starting with reducing the drain out of the producing regions.
2. Increasing production and productivity of all small millets in a sustainable way, starting by reversing the decline in cultivated area.

Multi-stakeholder participatory research needed to act as a catalyst for realizing this development strategy. The state needs to create a level playing field for small millets when compared to other food grains and other sectors. Only then it is possible to jump start the small millets economy to a threshold level where the market can play a significant role. While there are some policies for production support and for inclusion of small millets in public food schemes, there are currently no policies for creating local medium scale processing infrastructure and for local market development.

Policy change is a long term process and needs continuous efforts. So the initiatives taken in the RESMISA project can be seen as the beginning and more intensive activities to be taken up in the coming years, mainly for developing and demonstrating concrete multi-stakeholders integrated intervention pilots at production cluster in different socio-cultural and economic contexts for effectively linking local production and consumption by integrating production support, processing, marketing and introduction in public food schemes. This would help in developing scaling up models of state facilitated promotion of small millets for addressing nutrition security.

Further efforts need to be taken for developing and establishing the following institutional arrangements for promoting small millets economy.

1. Promoting an innovation platform covering all the stakeholders for structured interfacing among them to address many serious constraints (Eg. low shelf life of processed produce) and to promote nutrition related standards (Eg. optimum level of polishing).
2. Allocation of adequate funds and strengthening the research institutions for the mandate of carrying out broad based participatory evaluation of varieties and other technologies in the remote areas where small millets are increasingly confined to and customized participatory research for & with different stakeholders.

# ANNEXES

## Annex – 1

### Will millets run the race for food security? Prospects of promoting millets as staple food in Tamil Nadu

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#### Abstract

Increasing universalization of diet toward rice and wheat has severely impacted dietary diversity of cereals and popular consumption preferences. Millets are good source of protein, vitamins and essential minerals and considered to play vital role in management of non-communicable diseases. Although there is growing awareness about millet's nutritional benefits, its share has decreased in people's food consumption practices due to biased food and agriculture policies and changing norms. Understanding popular perceptions of healthy food and the drivers of those perceptions is essential to the design of successful state-led food security measures. This paper analyses factors responsible for the shift in consumption of small millets and then examines the potential for reversing the trend. It does so by assessing knowledge, attitude and behavior with regard to small millets among rural and urban populations in Tamil Nadu. The paper reports on interviews with consumers, producers and policy makers and officials at various levels. Results suggest that the rural and urban poor are alike in expressing good knowledge, positive attitudes and preferences for small millets. The poor are willing to increase consumption of millets, and ready pay triple the price of rice and wheat for millet at PDS. It emerges that awareness programs for nutritional benefits of millets and procurement and distribution of millets through PDS can revert back its consumption and improve nutritional health of poor. The paper concludes with suggestions for policy makers to introduce small millets into existing PDS procurement and distribution processes.

**Important words:** *Small millets, PDS, Knowledge, Attitude, Willingness to pay, Tamil Nadu, India*

#### Acknowledgement

This research was conducted under Postdoctoral Fellowships Program of RESMISA project managed by Canadian Mennonite University, Winnipeg, MB, Canada. The RESMISA project was supported by the Canadian International Food Security Research Fund, a program of Canada's International Development Research Centre undertaken with the financial support of the government of Canada provided through Foreign Affairs, Trade and Development, Canada. The authors acknowledge DHAN Foundation and WASSAN, India for providing logistics and rapport building support in the field. Most importantly, the authors are indebted to the farmers

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from all three research sites for their valuable time and informati

## 1 Introduction

Liberalization and globalization has accelerated economic growth in India; however, its benefits are not translated equally to all sections of community. Almost 22 percent people are still living in extreme poverty with less than a dollar a day (Economic Survey, 2013). Merely 35 percent households use improved sanitation and nearly 45 percent children under five are underweight (UNICEF, 2013). As per the latest NSSO survey more than 99 percent households have access to two full square meals a day (NSSO, 2013). However, despite expansion of endowment and entitlements of food to the poor through Public Distribution System (PDS), Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), and other nutritional programs such as Integrated Child Development Scheme (ICDS), Midday Meals etc., the number of malnourished people in India are steady over the last two decades (FAO, WFP, & IFAD, 2013). According to HUNGaMA survey report -2011, 42 percent children under five are underweight<sup>2</sup> and 59 percent are stunted<sup>3</sup> (Naandi, 2011). National Family Health Survey 2005-06 reported more than 55 percent of women and 24 percent men as anemic in the country (Arnold et al., 2009).

Declined food diversity and unbalanced food consumption are considered the potential causes for hidden hunger, which is a threat to food and nutritional security (Khoury et al., 2014). Delocalization<sup>4</sup> and economic advancement have been the change in composition and pattern of Indian diet. With rising middle class and changing food preferences, people have moved away from traditional staples to nutrient rich costlier western diets, which are heavily laden with protein, fats and sugars (Kaicker et al., 2011). Based on NSSO surveys results Deaton and Dreze (2009) have argued that PDS and biased agriculture support policies encouraged declining of cereal food diversity to only rice and wheat. Though PDS has catered poor's food demand, it is one of the main causes for erosion of traditional, subsistence consumption pattern which was more diverse and balanced. PDS have moved people away from consumption of coarse cereals such as sorghum, pearl millet, finger millets and small millets (Popkin et al., 2001; Ramchandran, 2008).

Small millets are more nutritious and rich in protein, calcium, iron, other minerals, and vitamins compared to rice and wheat (FAO, 1995; Singh & Raghuvanshi, 2012). Their lower glycemic index, high fiber content, and gluten free properties are important for management of non-communicable diseases such as diabetes (Devi et al., 2014; Jali et al., 2012; Nambiar et al., 2011; Thathola et al., 2011). With narrow inter group diversity; poor may not be able to compensate their loss of millet-based nutrient intakes from other food groups. Thus, persistent high level of under nutrition could have some link with narrowing of intragroup cereal diversity.

In the last few years, small millets have regained some focus on policy grounds. Initiative for

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<sup>2</sup> Weight for age z score

<sup>3</sup> Height for age z score

<sup>4</sup> Delocalization refers to process in which food varieties, production methods and consumption patterns are disseminated throughout the world by intense network of socio- economic and political interdependency (Pelto & Pelto, 1983)

Nutritional Security through Intensive Millets Promotion (INSIMP) scheme was launched recently by the Government of India in 2011-12 for improving production and post-harvest technology of small. Now it has been merged with national food security mission on millets. Introduction of INSIMP is positive change, but small millets are still lacking price, procurement and distribution support. “National Food Security Ordinance” (NFSO) also recommends distribution of millets through PDS, however policy decisions regarding distribution of small millets through PDS are not moving around fast. Structural issues related with production, availability and processing of millets could be reasons for no or delayed action by state governments. However, decision makers may also need more information regarding people’s preferences, acceptability and availability of small millets for successful intervention.

Scholarly literature is available on PDS performance and its role in nutritional security in India. However, there are gaps of information on people’s preference, attitude and behavior towards small millets in India. This study tries to address those gaps in Indian school of literature. International research focused on understanding consumer preferences of sorghum and other millets (Kebakile et al., 2003; Makindara et al., 2013; Ohiokpehai et al., 1998) contribute to our understanding of broader perspectives of attitude and behavioral aspects in dietary pattern and program planning. However, we also need local perspectives for planning local programs. In this paper, we try to understand factors responsible for shift in millet consumption, and explore the possibility of people’s acceptance of millets by measuring their knowledge, attitude and behavior regarding small millets. Our goal is to facilitate policy decisions in regards to promotion of small millets through PDS in order to achieve greater nutritional security. Central to the goal, the study was implemented with the following three objectives: i) Identify consumer preferences for small millets in terms of knowledge, attitude and behavior and their willingness to consume; ii) Appraise and understand people’s willingness to pay for small millets; and iii) Assess production and market availability/supply of small millets.

## 2 Data

Data were collected from rural millet crop growing<sup>5</sup> areas (Jamunamarathur block in Thiruvannamalai district), rural non-millet crop growing areas (Kumbakonam block in Thanjavur district), and urban slum areas (Krishnagiri city) of Tamil Nadu - India during April – June 2013 and December 2013 – January 2014. The research locations were selected in consultation with the RESMISA project team members considering cropping system, settlement type (rural and urban slum), level of poverty, easy community support, and presence of facilitating organizations. The purpose of selecting three different types of area was to compare people’s utilization and preferences of small millets and their willingness to pay for it. Random sampling technique was used for selecting the survey respondents. From the panchayat list of selected blocks, Kovillur and Pattesswaram panchayats were selected randomly as millet and non-millet rural study areas. At panchayat level, out of 67 habitats of Kovillur panchayat, 13 (20%) were randomly selected to keep participant selection around 100 to 110 and to manage travel time. In the final stage, household population frames were developed for each panchayat and selected slum areas by accessing household information from local ICDS centers and 10 percent households were selected randomly

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<sup>5</sup> Millet growing rural areas and millet rural areas as well as non-millet growing rural areas and non-millet rural areas have been used interchangeably in this paper.

as potential participant for the survey. Qualitative interviews were administered by convenience sampling by contacting traders, government officers and villagers. Both questionnaire surveys, and qualitative interviews and group discussions were administered with help of bilingual field assistant (DHAN office staff) in local Tamil language and then information was translated into English for further analysis.

Mixed methods of quantitative and qualitative research were used for data collection. Quantitative data were collected semi-structured survey of 303 households, while qualitative methods included four focus group discussions and seven in-depth personal interviews with farmers, traders and government officials. The survey covered socioeconomic and demographic profiles of the research participants, food consumption, willingness to consume small millets, objective measurement of knowledge, attitude and behavior for small millets, and willingness to pay for small millets. Knowledge was estimated by calculating knowledge index measured through eight dichotomous variables related to cultivation, storage, use, and health benefits of small millets. The Cronbach's alpha coefficient for knowledge scale was 0.49. Attitude was estimated by calculating attitude index measured through four variables on belief, pride, and honor related to use of small millets. These variables were measured on a six point Likert's scale ranging from "strongly disagree" to "strongly agree". Originally attitude was measured on eight variable items; however four items were removed from the scale due to inconsistent behavior. The Cronbach's alpha coefficient for attitude scale was 0.37 which is not good but still acceptable. Similarly, behavior was estimated by calculating behavior index measured on three variables related to current practices on the use of small millets, convincing others, and serving of small millet foods. Participant's willingness to increase consumption of small millets was measured through a direct question "*How likely are you willing to increase your (your household's) consumption of small millet?*" The responses were recorded on six point Likert's scale ranging from "extremely unlikely" to "extremely likely".

Questionnaire survey data were analyzed using the IMB Statistics 19 statistical software and R studio. Descriptive statistics, t test, ANOVA and linear and Probit regression analysis were performed for dependent variables with independent demographic and other covariates. Qualitative data were analyzed through qualitative content analysis (Zhang & Wildemuth, 2009). Open source software '*Weft QDA*' was used for thematic analysis of qualitative interviews.

### **3 Results**

The results are presented in four sections – (a) trend and status of millet consumption, (b) knowledge, attitude and behavior regarding small millets, (c) people's willingness to consume and pay, and (d) important challenges. Table 1 shows that study participants were middle aged (43 years) with average schooling of only five years. Literacy rate was very low (59.7%) compared to state averages (88.33%). The majority of respondents were Hindu (85.5%), belonging to Below Poverty Level (BPL) category (82%) and almost half (56%) were from backward caste (56%). Furthermore, from Table 1 it is seen that our sample is almost close to demographic profile of NSSO sample of round 68 implemented in 2011-12. Thus, it is somewhat representative to state averages.

The major sources of livelihood in study areas were agriculture and non-agriculture wage labour. Non-agriculture wage labour was an important source of livelihood for urban slum poor. Moreover MGNREGA scheme and opportunity of labor job in industries around non millet growing study areas in Tamil Nadu have facilitated many respondents to switch over their livelihood from agriculture to

non-agriculture labor sector. In terms of dietary transition, almost 74 percent respondents reported decreased consumption of millets in the last five years; however, 90 percent expressed their willingness to increase its consumption in the coming years.

**Table - 1: Descriptive statistics on socioeconomic profile and other important variables**

Particulars	Millet growing rural	Non millet rural	Urban slum areas	Total*	State average as per NSSO
<b>Mean age of respondents</b>	38.2 (10.6)	48.5 (13.4)	42.6	43.0 (13.2)	46.9
<b>Mean household size</b>	5.18 (2.0)	4.08 (1.82)	5.28 (1.5)	4.87 (1.9)	4.35
<b>Mean schooling years</b>	2.7 (4.3)	6.6 (4.9)	5.9 (5.3)	5.0 (5.1)	
<b>Illiterate %</b>	52.0%	18.4%	29.6%	41.3%	23.4%
<b>Mean household income (Rs)</b>	20070.00	60041.00	34392.00	37792.00	
<b>Sex of respondents; %</b>					
Male	19.1 (58)	20.5 (62)	24.8 (75)	64.4 (195)	88%
Female	13.9 (42)	11.2 (34)	10.6 (32)	35.6 (108)	11%
Total	33.0 (100)	31.7 (96)	35.3 (107)	100.0 (303)	
<b>Social category of HH; %</b>					
Schedule caste (SC)	0	8.9 (27)	14.8 (45)	23.8 (72)	20.8%
Schedule tribe (ST)	32.7 (99)	0	0.3 (1)	33.0 (100)	1.2%
Other backward caste (OBC)	0.3 (1)	21.5 (65)	20.13 (61)	41.7 (126)	75.3%
General caste (GC)	0	1.3 (4)	0	1.3 (4)	2.6%
<b>Economic category of HH, %</b>					
Below poverty line (BPL)	30.0 (90)	27.7 (83)	24.3 (73)	82.0 (246)	88.6% **
Above poverty line (APL)	0	0.3 (1)	0.3 (1)	0.7 (2)	7.7%
Ultra poor (Antyodaya)	3.0 (9)	3.7 (11)	10.7 (32)	17.3 (52)	3.7%
<b>Religion of HH, %</b>					
Hindu	38.6 (100)	31.0 (94)	60.7 (65)	85.5 (259)	88.5%
Christian	0	0.3 (1)	0.3 (1)	0.7 (2)	6.4%
Muslim	0	0.3 (1)	13.5 (41)	13.9 (42)	4.8%
<b>Change in millet consumption, %</b>					
No change	2.0 (6)	10.9 (33)	9.2 (28)	22.1 (67)	
Increased	0.3 (1)	1.7 (5)	1.3 (4)	3.3 (10)	
Decreased	30.7 (93)	19.1 (58)	24.8 (75)	274.6 (226)	
<b>Willingness to increase consumption of millets, %</b>					
Likely	33.0 (100)	27.7 (84)	29.7 (90)	90.4 (274)	
Unlikely	0	4.0 (12)	5.6 (17)	9.6 (29)	
<b>Mean knowledge score (Measured on Yes &amp; No scale)</b>	1.8 (0.18)	1.7 (0.15)	1.6 (0.14)	1.7 (0.17)	
<b>Mean attitude score (Measured on 6 point Likert scale)</b>	5.17 (0.84)	4.4 (0.76)	4.8 (1.05)	4.8 (0.95)	
<b>Mean behavior score (Measured on 6 point Likert scale)</b>	1.6 (0.36)	1.4 (0.30)	1.4 (0.31)	1.5 (0.34)	

Value in bracket indicates std. deviation for mean values and number of respondents for frequency.  
\*Total may vary due to missing value; \*\* Rice cards

### 3.1 Trend and status of millet consumption

**(i) Current level of consumption - Total cereals and small millets:** Cereal consumption has decreased in Tamil Nadu at state level by 12.20% in rural areas and 15.55% in urban areas (Table 2). Millet to total cereal consumption (MTCC) ratio in rural areas of the state decreased from 0.09 in 1993-94 to 0.01 in 2011-12. The MTCC of state's urban areas was marginally decreased by 0.002 point between 1993-93 and 2011-12. The base level consumption of millet in state's urban areas was very small in 1993-94 and there was little scope to decrease noticeably from the base level consumption.

**Table - 2: Trends in monthly per capita consumption of cereals (kg)**

	TN State Average				TN Study area			
	1993-94		2011-12		Year 2013, Mean		Year 2013, Median*	
	Rural N=390	Urban N=404	Rural N=331	Urban N=332	Rural N=196	Urban slum N=107	Rural N=196	Urban slum N=107
Rice	10.32	9.13	8.64	7.41	9.77 (47.8)	8.87 (45.05)	9.12	8.69
Wheat	0.34	0.84	0.72	1.01	1.58 (20.9)	2.77 (25.9)	1.08	2.16
<b>Total fine cereals</b>	<b>10.66</b>	<b>9.97</b>	<b>9.36</b>	<b>8.42</b>	<b>11.35</b>	<b>11.64</b>	<b>10.20</b>	<b>10.85</b>
Sorghum	0.15	0.01	0.007	0.000	0.180 (8.4)	0.020 (1.7)	0.000	0.000
Pearl millet	0.25	0.01	0.012	0.002	0.830 (15.0)	0.050 (2.4)	0.280	0.000
Maize	0.01	0.00	0.002	0.001	0.390 (7.2)	0.010 (0.1)	0.130	0.000
Finger millet	0.62	0.07	0.120	0.045	1.470 (19.1)	1.550 (12.9)	1.080	1.440
Small millets	0.03	0.00	0.001	0.000	0.750 (17.7)	0.000 (0.5)	0.050	0.000
Other cereals	0.00	0.00	0.002	0.016	-	-	-	-
<b>Total millets</b>	<b>1.06</b>	<b>0.09</b>	<b>0.14</b>	<b>0.06</b>	<b>3.62</b>	<b>1.63</b>	<b>1.54</b>	<b>1.44</b>
<b>Total cereals</b>	<b>11.72</b>	<b>10.06</b>	<b>9.50</b>	<b>8.48</b>	<b>14.97</b>	<b>13.27</b>	<b>11.74</b>	<b>12.29</b>

Value in bracket shows std. deviation.

\* Due to unacceptable level of high standard deviation, median consumption level is presented for comparison. Sources: NSSO survey round 50, report no. 402 and round 68, report no. 558 for national and state consumption averages.

Compared to national and state averages, consumption of millets in the study areas was high in

both rural and urban slum areas. From Table 2 it is seen that the median MTCC ratio for rural study areas was 0.13 and for urban slum under study it was 0.11. All surveyed households in millet growing areas reported millet consumption; however, it was only 58 percent in non-millet rural areas. Surprisingly, 97 percent urban slum respondents said that they are consuming millets; however, their consumption of number of millets and its frequency was strikingly different than those of millet growing rural areas. Overall 60 percent respondent families included single type of millet in their diet, while at least one third consumed two types. Around 99 percent respondent households in millet growing areas consumed two or more millets; while around 99 percent in non-millet rural areas and urban slums consumed only single millet that is finger millet.

**(ii) Frequency of millet consumption:** In our analysis, we treated consumption frequency of finger millet as proxy of consumption frequency for small millets, as it was consumed widely by almost all millet consuming respondent households. In terms of frequency, at least 20 percent of respondent households in millet growing areas consumed millets on daily basis, while only six percent households in non-millet areas consumed it on daily basis. Surprisingly, 30 percent respondent household in urban slums consumed it on daily basis. On the other side, 42 percent respondent households in non-millet rural areas were not consuming millets which was unexpectedly high percentage compared to urban slum areas where only 2 percent of respondent HHs were not consuming millets.

**(iii) Changes in consumption of small millets - Qualitative analysis:** Corresponding to quantitative information, our subjective question “what type of changes have been there in your (your household’s) consumption of small millets in last five years?” also supports similar outcome of decreased consumption of millets. A total of 74 percent respondents said that their household consumption of small millets have decreased in last five years (Table 3). The decrease was more pronounced in millet growing areas (93%) followed by urban slums (70.1%) and non- millet rural areas (60.4%).

**Table - 3: Perceived change in HH consumption of small millets during last five years**

<b>Change in small millet consumption in the last five years; %HH * N=303</b>				
<b>Study areas<sup>6</sup></b>	<b>No change (N=67)</b>	<b>Consumption increased (N=10)</b>	<b>Consumption decreased (N=226)</b>	<b>Total (N=303)</b>
Millet rural	6	1	93	33
Non-millet rural	34.4	5.2	60.4	31.7
Urban slum	26.2	3.7	70.1	35.3
<b>Total</b>	<b>22.1</b>	<b>3.3</b>	<b>74.6</b>	<b>100</b>

<sup>6</sup> Millet rural areas: Region / places where small millets are being cultivated regularly by majority of farmers. Non millet rural areas: Part of the state where small millets are being not cultivated and are not part of its regular cropping system. Urban slums: Underdeveloped, poor, and informal settlement in city area where people live in small katcha houses crowded with narrow streets, and lack sanitation, water and other basic facilities.



From the results, it can be said that the consumption pattern is fast changing among millet growing rural areas compared to non-millet growing rural and urban slum areas. People are fast moving away from millets in millet growing areas. Only one percent respondents in millet growing areas mentioned that their millet consumption has increased during last five years compared to 5.2 percent in non-millet areas and 3.7 percent in urban slums.

**(iv) Potential reasons for changes in consumption of small millets:** Survey results revealed that the most important reasons for declined consumption of millets (Table 4) in millet growing areas were: drudgery involved in processing and cooking of millets (42.6%), increased consumption of rice partly attributed to free supply of rice through PDS (37.2%), and change in cropping pattern leading to less area and production under millets (18.1%). However, limited or no availability of millets and its high price were the top most reasons cited by non-millet growing rural (76.2%) and urban slum (82.1%) dwellers. Against that only 6.4 percent respondent households reported health benefits of millets as the main reasons for increased consumption of millets.

Group discussion with the villagers highlighted the fact that commercialization of millets as cash crop is also one of the reasons for declined consumption of millets in millet growing rural areas. The following texts demonstrate how millets becoming a major source of income have affected household consumption.

*We get income only from little millet so we sale it in the market. For want of income we do not eat millets. [...]Millets are good but we work whole day and do not have enough time for processing, so that we consume more rice. When we have free time, we dehull millet on our own and consume it. Processing of millet is difficult and it takes time. If processing machine is available, then we are ready to increase millet consumption. Q. If you will increase consumption then what will happen to marketing of little millet? A. We will keep some quantity for home consumption and rest will be sold out in the market. If we produce 1000 kg then we will sale 500 kg in the market (Group of men and women from a village of Jamuanamarathur manadal).*

**Table - 4: Potential reasons for change in consumption of millets at household level**

Reasons	Millet rural areas	Non millet rural	Urban slum areas	Total*
Do not like/not willing to eat/children do not like	0	4 (80%)	1 (20%)	5 (2.1%)
Difficulty in processing & cooking/Drudgery	40 (87%)	4 (8.7%)	2 (4.3%)	46 (19.6%)
Increased consumption of rice/free rice from PDS	35 (92.1%)	0	3 (7.9%)	38 (16.2%)
Change in cropping pattern/less production of SMS	17 (89.5%)	0	2 (10.5%)	19 (8.1%)
Not/less available, high price & unable to purchase	0	48 (42.9%)	64 (17.1%)	112 (47.7%)
Others (for increased consumption of millets)	2 (13.3%)	7 (46.6%)	6 (40.0%)	15 (6.4%)
	94 (40%)	63 (26.8%)	78 (33.2%)	235 (100%)

\* There were 68 missing values as the question was not applicable to respondents who reported no changes in their consumption of small millets. From table 3 it is seen that numbers of such respondents were 67, while one respondent did not answer the question.

Breakthrough in processing technology always does not mean millet producer will increase their consumption of millets. With breakthrough in processing technology, producer will get even more price for processed millets and for that reason they might sale it more for bigger cash. The following texts from group discussion reiterate the fact that even if processing difficulty is addressed; people might not eat more millet. They might continue selling more millet for bigger cash.

*Q. You said that if you get dehuller then you will not sale in the market. Let you do not get dehuller but I process it free for you. In this case will you retain millet for your consumption? A. We keep little for consumption. See our cash crop is only little millet. We have children, we have to run house, so we have to sale it in the market **(Discussion with villagers in NGO (DHAN) office at Jamunamarathur)***

*Q. How much price would you like to pay for millets at ration shop? A. We are ready to pay Rs. 5 to 6 per kg. Q. If you get Rs. 25 (for your millets) then why you would like to pay only Rs. 5? A. We are consuming our millet then why we go for ration shop millet if it charges Rs. 25! Q. Because you need not to put hard work in processing of millets and you want to consume more. A. PDS shop gives free rice so we will go for it. We will continue buying rice instead of consuming millet **(Group of men and women from a village of Jamuanamarathur manadal)***

No or limited availability of millets as one of the major reason for declined consumption of millets in non-millet rural areas is also supported by the following text from one of our group discussion.

*Q. Do you consume any millet such as little millet or finger millet? A. No we do not eat it. 10 years back we used to eat finger millet but not now. Q. Why you stopped eating finger millet? A. Non availability is the main problem. We are not cultivating it. One person used to sale finger millet on bicycle but now he does not come here. Because of non-availability we are not consuming it **(discussion with members of women group in rice growing belt of TN).***

The majority of survey participants who were growing millets reported no change in their areas of cultivation under small millets in the last five years. Only 17.24 percent respondent households reported decrease in the area under finger millet cultivation; while 13.38 percent reported decrease in area of little millet cultivation. Contrary to our results, national data indicates drastic reduction in area and production of small millets (DES, 2013). According to Directorate of Economics and Statistics (DES) data sources, the area under small millets (excluding pearl millet, sorghum and maize) has decreased from 2.43 million hectares in 2007-08 to 1.97 million hectares in 2011-12. Correspondently, production of small millets has marginally decreased from 2.70 million tons in 2007-08 to 2.64 million tons in 2011-12. Little

change in the total quantity of millet production is attributed to increased productivity of finger millet; however little millet and barnyard millet production has declined significantly in the same time period.

### 3.2 Knowledge, attitude and behavior about small millets

**(i) Knowledge about small millets:** Knowledge index was developed on scale of 1 to 2 for measurement of knowledge about small millets. Respondents' knowledge of small millet was assessed on nine different points using dichotomous scale of "Yes" and "No". These points covered varying topics from cultivation, storage, and consumption to health impacts of small millets. From Figure 1 it is seen that study respondents had very good knowledge about small millets. This indicates that traditional wisdom is still alive in people's mind.

Categorization of knowledge index<sup>7</sup> into less, moderate and good knowledge categories and its analysis indicates that 80 percent respondents in millet growing areas held good knowledge about small millets, while it was only 52.1 percent in non-millet rural areas and 34.6 percent in urban slums. All other respondents had moderate knowledge. Overall 55.1 percent respondents had good knowledge about small millets.

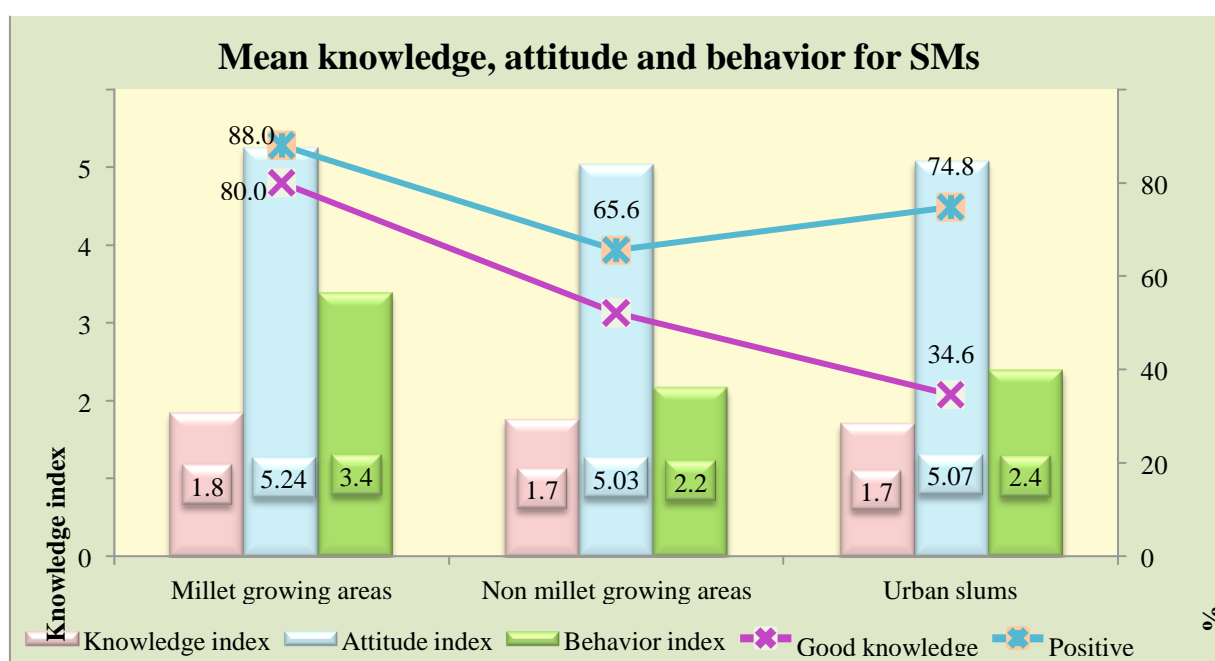


Figure 1: Mean knowledge, attitude and behavior level

Almost all study respondents mentioned that small millets are healthy food; gives more energy and strength to body; controls body sugar and blood pressure; and it contain more protein, minerals and vitamins. All these responses suggest that people have very good knowledge about health aspects of small millets. However, respondents' knowledge about storage and cultivation practices of millets was on lower side compared to knowledge of health benefits. This may be due to slum and non-millet area residents are not engaged in those practices.

<sup>7</sup> Knowledge index was categorized as 1 to 1.33 = less knowledge; 1.34 to 1.66 = Moderate knowledge; and 1.67 to 2.0 = Good knowledge

**(ii) Attitude towards small millets:** Attitude index on scale of 1 to 6 was developed for measurement of peoples' attitude for small millets. Attitude was measured on six point Likert's scale ranging from strongly agree to strongly disagree for seven different points. Although participants' responses were highly divided on some points such as "if choices are available then I would prefer to eat small millet food dishes", and 'Small millets are poor person's food and rich people should not eat it'; overall they expressed positive attitude for small millets across the study areas (Figure 1). That means people still have good impression about small millets. This positive attitude is good indicator for potential opportunity of reviving household consumption of millets.

**(iii) Behavior about small millets:** Behavior index on scale of 1 to 6 was developed for measurement of peoples' behavior regarding small millets. Behavior was measured on six point Likert's scale ranging from strongly agree to strongly disagree for three different points such as serving small millet foods to close relative and guest and participating in millet campaigns. Figure 1 indicates that against positive attitude, people's behavior regarding use and supporting millet promotion is not so impressive. People are not actively involved in serving millet foods and convincing family members especially children and others for consumption of millets. We measured actual behavior and that might be a reason for weak behavior. Measurement of perceived behavior might have yielded different scenario.

### 3.3 People's willingness to consume and pay

**(i) People's willingness to consume:** The majority of respondents were in favor of increasing consumption of small millets. When somewhat likely, likely and extremely likely categories are combined, almost 90 percent (N = 274) respondents expressed their willingness to consume or increase their consumption of small millets. About 10 percent respondents indicated that they would not like to consume small millets.

Probit results (Table 5) indicate that geographical areas of residence, education and behavior were significant predictor of respondents' current consumption as well as their willingness to consume small millets. Respondents being from non-millet rural areas decreased the probability of current millet consumption by 0.0047 and increased the probability of their willingness to consume millets by 0.011. Similarly one unit of change in education increased probability of current consumption and willingness to consume millet by 0.00017 and 0.00011 respectively. Likewise, unit change in positive behavior increased the probability of current consumption by 0.0035 and the probability of willingness to consume by 0.0026. Although parameter of estimates for knowledge was not significant, one unit of change in knowledge decreased the probability of current consumption by 0.0016 and increased the probability of willingness to consume more millets by 0.00007. This may be due to large decline in millet consumption among respondents of millet growing rural areas who were at the same time were also more knowledgeable about millets compared to other respondents. Being male decreased the probability of current consumption but increased the probability of their willingness to consume millets. Parameter of estimates were not significant for age and attitude but surprisingly an unit change in respondents' age and attitude was observed to decrease the probability of current consumption as well as willingness to consume millets.

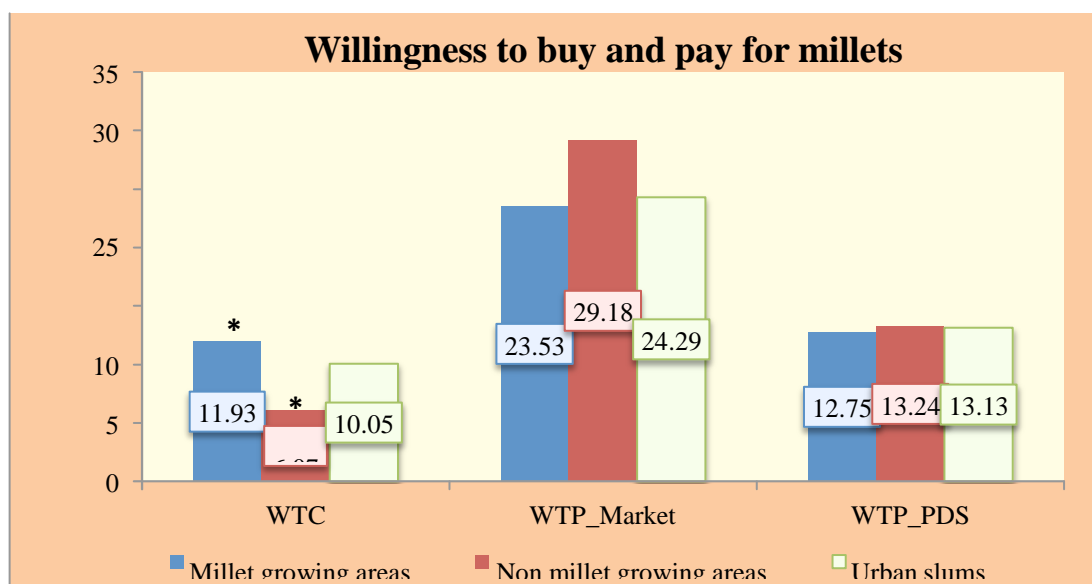
**Table -5: Marginal effect of parameters on participants' current status of consumption and willingness to consume small millets**

Parameters	Marginal effects (Probit model)		
	Current consumption	Willingness to consume	Currently consume & willing to consume
Intercept	(0.995)	(-0.868)	(0.219)
Male	-0.0011 (-0.46)+	0.00007 (0.03)	-0.00036 (-0.16)
Millet growing rural areas	0.0094 (4.05)	0.011 (4.90)	0.011 (5.27)
Non-millet rural areas	-0.0047 (-2.04)***	0.0014 (0.61)*	-0.0018 (-0.86)***
Willing to consume SMs	0.0015 (0.65)+		
Currently consuming SMs		0.0013 (0.60)+	
Age	-0.000056 (-.002)	-0.000021 (-0.009)	-0.000011 (-0.005)
Education	0.00017 (-0.07)**	0.0000006 (0.0003)	0.00011 (0.05)*
Knowledge	-0.0016 (-0.67)	0.00007 (0.03)	-0.00075 (-0.35)
Attitude	-0.00012 (-0.05)	-0.000004 (-0.001)	-0.00025 (-0.11)
Behavior	0.0035 (1.52)**	0.0026 (1.17)*	0.003 (1.39)***

Figures in parenthesis are parameter estimates (coefficients)

\* Significant at 0.05; \*\* Significant at 0.01; \*\*\* Significant at 0.001; + Significant at 0.1

**(ii) People's willingness to pay:** On average respondents were willing to buy nine kilogram of millets per month for consumption. It was observed that most respondents liked to buy value added product in form of flour or rice. People's willingness to buy millets were subject to a two way analysis of variance with gender and study area as well as three levels each of age and education. The main effect of types of study areas yielded an F ratio of  $F(2, 265) = 32.46$ ,  $p < 0.001$ , indicating mean willingness to buy millets was significantly greater for respondents of millet growing rural areas ( $M = 12$   $SD = 1.38$ ) compared to Non millet rural areas ( $M = 5.80$ ,  $SD = 1.27$ ) and urban slums ( $M = 9.90$ ,  $SD = 1.25$ ; Figure 2). Main effect of gender, age and education were not significant at five percent level of significance. When asked about willingness to pay, on average, respondents were ready to pay Rs. 25.50 for one kilogram of millets if they buy it from open market; however, if they buy it from PDS, they were ready to pay only Rs. 13.00. People's willingness to pay for millets at Public Distribution Shop (PDS) were analyzed on two way analysis of variance with types of gender and study area as well as three levels each of age and education.



**Figure 2: Respondents' willingness to consume (quantity) and pay for small millets**

The main effect of types of study areas yielded an F ratio of  $F(2, 198) = 0.49, p = 0.61$ , indicating mean willingness to pay for millets at PDS was not different among all three study areas. Main effects of gender, age, and education were also not significant at five percent level of significance.

**(iii) Factors governing shopping and usage of millets:** Reinforcing the results of interviews and group discussions that children do not like to eat millets and many consider it inferior and poor people's food, many respondents mentioned that social status was important for them governing their usage of millets. However, price, availability, appearance, and nutritional quality of millets were very important for the majority of households compared to social status. Table 6 shows that more than 83 percent respondents mentioned that appearance of millet and nutritional quality are very important parameters that influence their household usage of millets. Over 50 percent respondents also considered price and availability in market very important parameters influencing their shopping behavior.

**Table - 6: Factors influencing shopping and usage of millets**

Factors	Not very important	Somewhat unimportant	Somewhat important	Very important
Price of millets	45.9	1.0	2.3	50.8
Availability in market	42.6	1.3	1.7	54.5
Quality and appearance	11.2	2.6	1.0	84.5
Nutritional aspect of millets	6.6	7.3	2.3	83.8
Social status of consuming millet	56.1	8.3	5.3	29.7

Against that social status of consuming millets was important for 29.7 percent of respondents. That means one in every three respondents was concerned about his/her family's social status of

eating millets.

### 3.4 Important challenges

**(i) Production and availability of small millets:** Production and availability can be important constraints for large scale procurement of millets. From Table 7 it is seen that the current level of production is able to supply at least 1 to 3 kg of small millets per month to each card holders, provided all production is available for distribution in the state itself. Our market chain analysis indicates that majority of small millet production is exported out of the state (to Nasik in Maharashtra) for processing and further distribution to other parts of the country. Our results also showed non availability or very high prices of millets in local market due to shortages as the major constraints almost for half of the respondents.

**Table - 7: Production and availability of millets 2011-12**

	<b>Production, Tons</b>	<b>Ration cards (2013)</b>	<b>Availability, Kg per card</b>
2011-12	628400	19585000	32.09
2012-13	386800	19585000	13.62

Source: Directorate of economics and statistics, department of food and civil supplies

**(ii) Secondary market of PDS food grains:** Secondary market of PDS food grains especially of rice developed due to free or cheap and poor quality of ration could be another constraint to increase consumption of millets through PDS. The group discussion participants revealed that paddy cultivating households and other rich families usually resale their share of PDS rice to others in the village or to traders in nearby market. Rice cultivating families do not like to eat PDS ration due to its poor quality. The following script demonstrates existence of secondary market:

*Q. Do resale of PDS rice happens in your villages? A. Yes (one lady said), some farmers resale it. (Another lady said) some families are using it for feeding cattle. So who are selling PDS rice in the market? People are not selling PDS rice in the market but they are selling it to other families within the village. Some families require 30 kg rice per month and her (pointing at lady) family gets only 15 kg from PDS so she purchases another 15 kg of PDS rice from other families (group of women from rice belt of Tamil Nadu).*

Secondary market of PDS food grain is well established at grass root level. If millets are - which are costly - supplied through PDS at cheap rate then high market value of millets and existence of secondary market could prompt many families to cash it rather than consume it.

**(iii) Policy level attitude, beliefs, and economic impartiality towards millets:** Analyses of personal interviews indicate that there are mixed responses in terms of attitude among government officers and policy makers concerning to millets. The majority of officers and decision makers were positive about nutritive superiority of millets and most of them favored its

promotion through government welfare schemes such as PDS and ICDS. Despite such positive attitude the majority of them were not in favor of extending same subsidy support enjoyed by rice and wheat. The following interview texts display policy attitude and beliefs about millets:

*In rural area, people considered millets as poor man's food (Brown food for Brown skin). But, millet is an excellent crop, require less water, good fodder crop; and can be cultivated in our wastelands. We insist that the government should include millets in PDS and malnutrition programs. Let me say that millets in PDS is not for replacing rice but it should be an additional commodity, since it is politically handled. Replacement of rice is politically not possible and also we cannot do it due to limited area and production under millet (**Government Officer**).*

*Q. Why you all are end up only with PDS suggesting supply this and this! A. [...]If you are here for discussion on introducing millets in PDS then let me tell you that we are not ready to supply it through PDS. No millet in PDS. Q. We would also like to discuss for including millets in ICDS. A. Children are not... that give them anything. Children are not suffering from diabetes, they do not need it then why are you targeting them! Q. What will happen if we supply millet? A. People will throw it out (use for other purpose). [...]Before thinking promoting millets through PDS, you should change people's mindset. When you talk supplying millets through PDS, people demand it free. Today millet cost Rs. 65 per kg, how can we manage giving it free? Q. Our consumer survey indicates that people are willing to pay Rs. 8 to 10 per kg. A. If they are ready to pay that then also it is huge money and cannot be possible. So if you are talking millets in PDS, then my answer is "No millets in PDS". [...]I am not in favor of including millets in PDS at subsidized rate. I am for retail marketing of millets rather than making it subsidized commodity in PDS (**Another government officer**).*

Policy environment is incoherent for promotion of millets through PDS. Decision makers support millets for its nutritional superiority and its synergistic crop-cattle-environment relationship. However, any financial support to millet is viewed as burden to government. This economic partiality for rice and wheat can be one of the major constraints for successful introduction of millets in government welfare schemes.

## **4 Discussion**

### **4.1 Consumption**

For decades people of India have cherished delicious, nutritive millets as staple food. However, continued dietary transitions have moved away people from staple millet to staple rice and wheat. Millet consumption has decreased immensely during post green revolution period (Watson et al., 2014). At national level, per capita millet consumption has decreased by more than 50 percent in last two decades since neoliberal reforms. In our study, almost 74 percent respondents reported decreased consumption of millets in their families. Current consumption practices indicate that changing socio-cultural and political economy is mainly responsible for such tremendous shift in dietary consumption from millets to rice and wheat.



At sociocultural front, drudgery in processing of millets due to lack of small scale household level processing technology, and difficulty at cooking of millets discourage families, especially women to include it in their household menu. Rice is women friendly food. It cooks easily and saves women's time that otherwise they would spend for processing of millets after a whole day of labor. A 19.6 percent of all respondents and 87 percent in millet growing rural areas stated that they are less consuming millets due to laborious processing and cooking of millets. Along with drudgery in processing, changing food preferences & taste for western style food are also driving dietary shift towards rice and wheat particularly in young generation. Kaicker et al. (2011) point at delocalization and economic advancement for changing food preferences to move people away from consuming millets.

At political economy front, the focus of green revolution and public food distribution policies on rice and wheat has resulted in decreased cultivation, production, availability and consumption of millet in rural and urban areas. None or less availability of millets in local market or their unaffordable prices are documented by many respondents (48.0%) as one of the primary reasons for decrease in millet consumption. More than 16 percent respondents said that supply of cheap or free rice through PDS has made them to consume more rice and less millet. The traditional system of cultivation and consumption of millet has responded negatively to cheap supply of rice and wheat through PDS. Rice has ingrained such a deep psychologically impression that many people, especially youngsters now consider millet an inferior food and do not like to eat anymore due to social stigma attached to it. These reasons indicate how enormously political environment of green revolution and public food distribution policies have influenced composition of Indian diet. Deaton and Dreze (2009) also observed that PDS and biased agriculture policies have narrowed food diversity of cereals towards rice and wheat.

On other hand, with increasing awareness about millet's nutritional quality, its acceptance among urban rich and middle class folks is on the rise (Bala Ravi et al., 2010; Bergamini et al., 2013; Porrvaja, 2013). According to traders, millet prices have gone up by three times in last 6 to 7 few years due to rising demand of millets in urban market. In response to higher market prices, small millets have become market oriented crops and increasingly they are treated as cash crops by producers. The producers who traditionally consumed millet are selling it in market for cash. It has been observed that farmers retain finger millet for home consumption, but entire little millet is sold out in the market. Market orientation of millets have invoked tremendous shift in dietary composition of farm families from staple millet to rice and wheat. Traditional consumers are less or not consuming millets and due to high price it has become out of reach for many non-producers and poor.

Although millets consumption has declined tremendously nationwide due to varied reasons, people in Tamil Nadu have continued to consume it substantially above the national average. Albeit consumption of millets has also significantly declined in these areas, it does have retained traditional millet based food culture alive. The survival of millet food culture in the study areas offers a space for revival of millet consumption in both states.

## **4.2 Knowledge, Attitude and Behavior**

Recent research shows that healthy eating has become important topic in public discourses on

food and food choices (Klaus, 2007; Lalor et al., 2011). Millets are nutritionally rich compared to rice and wheat (FAO, 1995). Clinical and epidemiological studies have established millet's important role in management of non-communicable diseases such as diabetes and cardiovascular risk (Choi et al., 2005; Jali et al., 2012; Kumari & Sumathi, 2002). Hence, it is important to understand people's knowledge, attitude and behavior regarding millets for identifying opportunities to promote it through government welfare schemes.

The result of this study reveals that overall people have good knowledge and positive attitude about millets. Knowledge about health benefits was universal. Almost all respondents agreed that millets are more nutritive, it helps to maintain fitness and keep diseases away. Attitudinally, almost 65 percent respondents do not feel dishonored if they are served millet foods and the same proportion of respondents do not consider millets as poor's food either. However, around 33 percent would not choose millet food in their dishes if they were given choices. One in four would not talk proudly to friends if he/she ate millet food. Results of Probit analysis also indicate that both good knowledge and positive attitude decreases the probability of a person currently consuming millets. This shows that psychology of millet is complex and it does not let people to translate good knowledge and positive attitude into action. More than two third respondents were consuming millets but the frequency of intake was very low especially in non-millet areas and to some extent in urban slums. In other areas of behavior, people were not active at convincing family members and others, especially their children for consuming millets or at serving millet foods to visitors and guest. Theoretically behavior is the function of attitude, subjective norms and perceived behavioral control (Ajzen, 1991). People know health benefits of millets. They held positive attitude. However, undesirable subjective norms (social and psychological barriers) and behavioral control (constraints) restricts consumption of millets. People do not want to compromise with price, profit, appearance of food, PDS rice or physical strains required for processing of millets. For many, the appearance of millets makes them to turn away from millet. During our discussion, one of the government officer described people's concern regarding appearance of millets from one of her conversation with villagers. In her words, *"during my visit villagers said that finger millet is red and brown so they do not prefer to eat it. They think eating finger millet makes them brown. Everybody wants to have fair complexion and that is why they prefer rice."* This shows how people's behavior of millet consumption traverse through its appearance and color. Such type of mental barriers reinforces the complexity in psychology of millet.

### **4.3 Willingness to consume and pay**

Advancing our understanding on people's perspectives of millets, we assessed people's willingness to increase consumption of millets. Willingness to consume provides thrust for entering into market, which is first step before purchasing an item. Almost 90 percent respondents mentioned that they are willing to increase consumption of millets. The main reason people would like to increase consumption of millet was high nutritional value and its role in management of non-communicable diseases. People have become health conscious with delocalization and economic advancement. Health and nutritional knowledge is encouraging people for choice of healthy food. Probit analysis results suggest that education, good knowledge and active behavior regarding millets increase the probability of a person willing to consume more millet. People who are currently consuming millets may probably resolve to consume more

millet compared to the one that are not consuming it now. Past studies have also observed robust link between people's nutritional knowledge and their willingness to consume healthy foods (Ares et al., 2008). People would prefer to buy millets in flour or rice form rather than grain due to difficulty in processing of grain millets. On an average people are willing to pay Rs. 13.00 per kg at PDS provided it is supplied in processed form of flour or millet rice. This is 13 times more than the proposed amount of Rs 1.00 per kg in newly enacted National Food Security Ordinance. On the other hand, affordability limits people's willingness to pay higher prices for millets in open market. On an average people are willing to pay Rs. 25.00 per kg of finger millet flour or millet rice, which is half of the current average market rate of Rs. 50.00.

Raising nutritional knowledge and benefits of millet is important parameter for reviving millet consumption; however, it may not be ultimate solution. We observed that people residing in non-millet growing areas held good knowledge about millets, though they are not active. This shows that knowledge is important but one may also need to look at complex web of price, profit, appearance, PDS, processing - and other constraints associated with availability and utilization of millets. Along with better communication and awareness raising programs, inclusion of millets in PDS and other government welfare schemes can increase millet consumption across the class (rich and poor), culture (rural, urban, millet, non-millet and slum), and caste. It can improve malnutrition situation in India by facilitating increased consumption of nutritious millets. Subsidized distribution of processed millets through PDS would address major complexities and barriers associated with consumption of millets. Smooth supply of processed millets at affordable prices will address household level constraint of laborious processing and help poor families to include it in their food budget to increase its consumption. Furthermore, PDS procurement of millets would offer assured market to producers. Agriculture support programs and procurement support can make millet farming a profitable venture for poor farmers in less fertile, hilly dry terrains and may encourage farmers to increase area under millet cultivation. It would increase poor farmer's market participation. Market participation usually reduce on-farm varietal diversity, but in case of millets it may actually encourage farmers to grow diverse food through better access to new varieties in local market and better return from these varieties (Takeshima & Nagarajan, 2012).

Although policy makers have favorable opinion for millets, they are not ready to leverage same subsidy benefits of rice and wheat to millets. The common argument for not supporting the idea of including millets in PDS is extra financial burden on state government, which in fact is not a reality. NFSO provides flexibility for state governments to supply millets through PDS without any implication on state financial resources as long as their distribution of food grains confirms with NFSO norms. However, there is lack of political will to replace even a small quantity of rice with millets. No political party wants to dismay powerful rice and wheat lobby for political mileage. Bureaucratic decisions also do not want to touch rice and wheat due to fear of dragging into policy conflict and unnecessary political reprisal from government. At state level, most political parties do not see any gain in its vote bank by including millets in PDS, as unorganized poor millet farmers' political voice is very thin to be heard against powerful voice of organized rice and wheat lobby.

Due to high market price of millets there is risk that many families may sale out PDS millets in

open market for cash profiting rather than consuming it. However, awareness raising about health benefits of millets can improve the situation on long run. Researchers have hailed the benefits of universal PDS of Tamil Nadu (Khera, 2011; Madhaiyan, 2014), but looking at the cash profiting from PDS food grains by rich and paddy growers, some researchers have suggested for quasi universal PDS to minimize the burden of food subsidy on state economy (Mahendran & Indrakant, 2014).

## 5 Conclusion

While malnutrition is continued to be serious issue, consumption of nutritious millets have decreased considerably in the last few decades due to dietary changes. Although people have good knowledgeable and positive attitude about small millets, it failed to impress their consumption behavior. Subjective norms (social belief and psychological barriers) about millets such as inferior food or poor's food, and perceived behavioral control (constraints) restrict people from consuming millets. Lack of millet processing technologies, less or non-availability of millet, high cost, and cheap or free PDS rice are some of the impeding factors for people to consume millets. However, people are ready to accept millets as staple food. The best possible option for increasing consumption of millets seems to be distribution of processed millet through PDS. Consumers are willing to pay 13 times more price for millet at PDS to increase their consumption of millets, provided constraints of processing and availability are lessened or removed. Major constraints related to processing, affordability and availability of millets could easily be lessened if millets are included in PDS. School education and knowledge of millets may increase probability of people's willingness to consume more millet. Although people have good knowledge, awareness rising programs about nutritional benefits of millets would lessen psychological barriers associated with millet consumption. In this scenario, the Tamil Nadu government may need to show political will to include millets in PDS. Limited production of millet and hence the availability is big challenges for increasing consumption of millets. Target based agriculture support policy programs for millet is critical requirement for increasing area under and production of millet crops. Considering positive outlook for millet consumption among study participants, it is the time for government to use millets and PDS as means for addressing persistent problem of malnutrition.

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## Annex – 2

### **Proceedings on “Promotion of Small Millets in Tamil Nadu” organised with State Planning Commission, Tamil Nadu on 24.01.2013**

**Summary Record of Discussion on “Promotion of Small Millets in Tamil Nadu” held on 24.1.2013 at 11.00 am in the Conference Hall of State Planning Commission, Chennai under the Chairpersonship of Tmt. Santha Sheela Nair, IAS (Retd.) Vice-Chairperson, State Planning Commission, Tamil Nadu.**

List of participants enclosed.

Initiating the discussion, Member Secretary, State Planning Commission welcomed the participants and highlighted about the importance of millets especially small millets in achieving nutritional security and food security.

In the inaugural address Vice Chairperson, SPC has informed that millets are drought resistant and highly nutritional crop. She highlighted the prevalence of large scale anemia and malnutrition related issues among the children and women and pointed out that the millet provide sufficient nutrition and enable to achieve the nutritional security, then DHAN foundation was invited to present the project on “Revitalization Small Millets in Rainfed Regions of South Asia (RESMISA).

Thiru. M.Karthikeyan, DHAN foundation highlighted the following in his presentation:-

The project aims to increase production and consumption of small millets, pulses and oilseeds crops in rainfed regions of India, Nepal and Sri Lanka.

- The project focuses on overcoming existing constraints related to production, distribution and consumption of small millets through gender sensitive participatory approach.
- The project expressed concern over the decline in area, production and consumption in Tamil Nadu / India over the years.
- There are 3 sites in Tamil Nadu, one each in Andhra Pradesh, Orissa and Jharkhand states where pilot projects were conducted.
- Two competing/conflicting focus area discussed are:-on-farm conservation and crop improvement. The initiatives like bio-diversity blocks and fairs, scouting for traditional varieties and morphological characterisation of genetic diversity, Participatory Varietal Selection (PVS), training to the farmers on production and post harvest management are practiced.
- The barriers to increase in millets production and consumption are :- lower or near absence of production support for millet crops; lack of appropriate post harvest processing technologies and inadequate research on production improvement.
- To revitalize indigenous knowledge of socio culture practices programmes like community biodiversity registry, recipe contest, school competitions and documenting indigenous knowledge were conducted.



- To create awareness, the wholesomeness of small millets and enhance their status in mainstream diets, media event like radio talk, WALKHOTAN, promoting small millets through local entrepreneurs and preparation of promotion materials like posters, films and booklets were adopted.
- Policy support needed for small millets consumption are
  - millet ought to be included into the public food programme like PDS,
  - support is needed for post harvest processing and
  - awareness creation should receive high priority

## Recommendations

After the detailed discussion, the following recommendations are emanated:-

- 1) To improve the millet production, similar to SRI for Rice, Millet Intensification Programme (*Guli* method) may be popularized by integrating research and extension.
- 2) The MSP for millets is announced by GOI every year, however public procurement is not done. Therefore, State government may arrange for procurement of millets wherever production is more resulting in higher market surplus.
- 3) Analysis of the reasons for declining of area under millets and shifting of food habits from millets to rice may be conducted.
- 4) Member (Agriculture and Irrigation) suggested for clear nutritional tagging of millets based products. The specific information on nutrition can contribute a lot on reduction of lifestyle diseases. Member Secretary, SPC informed that millets are rich in protein and such a tag would pave for easier inclusion of millets in the food basket of the consumers. Vice Chairperson also reiterated on the comparative nutritional constituents of millets over rice and emphasized that it should be give adequate publicity and awareness. Since millets like Cumbu and Sorghum are C4 plants (more efficient photosynthesis), Member advocated for extensive organic farming in millets and also suggested for avoidance of chemical inputs.
- 5) The myths in millets consumption among the people are criticized by Food Secretary and suggested that baked foods like biscuits, buns etc are better options for easy reach among the young generation. It was also informed that Chef.Mr Damu has been nominated as Brand Ambassador for Food department for popularization of millets. Vice Chairperson also endorsed the view and stressed the need for promotion of millets through novel and tastier recipes and informed that State Planning Commission also supports such food mela and recipe fair. Scientists from MSSRF indicated that ragi porridge is gaining ample awareness among urban people and consumption is higher among the poor people and indicated that attention should be bestowed on ensuring the quality of the porridge.
- 6) Based on Andhra Pradesh model, a pilot project on supply of millets in form of *laddu* in ICDS may be taken up. The pilots may be conducted in locations with wide diversity viz., Kanyakumari on one hand to Dharmapuri on the other hand.

- 7) Vice Chairperson mentioned about the popularization of wheat by the way of media, demonstration, recipe etc during early 1960s. Similar approach may be taken up to introduce the sale of millet in Public Distribution System along with recipes. She also informed about the nutritional superiority of millets over rice.
- 8) Member (A&I) emphasized for creation of **Bio diversity Registry** for Tamil Nadu.
- 9) DHAN foundation may approach Department of Agriculture and TNAU for increasing the millet promoting clusters and dovetailing the funds under Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP). The Executive Director, DHAN foundation stressed the importance of Participatory Varietal Programme which ensures the availability of quality seeds of millets among the farming community.
- 10) Member informed about supplementing millets for cancer patients in Rajaji hospital, Coimbatore and the results are promising in controlling the proliferation of cancer cells. In this regard, the Special Secretary to Health Department informed that necessary documentation of the success may be made to explore the possibilities of expanding the scheme to all cancer hospitals in the State.
- 11) Secretary to Government, Cooperation, Food and Consumer Protection has suggested the conduct of training for Tribal women on various millets recipe and also requested for supply of agricultural machinery through Tribal cooperatives for enhancing their efficiency. Gender friendly machinery especially for post harvest processing may be developed.
- 12) Vice chairperson suggested that the millets may be supplied through Public Distribution System as an addition and not as substitute to rice and requested the Food department to support through recipes and IEC materials. The field and post harvest related machineries may be supplied through Agri marketing and agribusiness department. Additional Chief Secretary (Planning and Development) suggested that quality of millets grains should be maintained and stressed for the need of provision of sieving and dehulling machinery to reduce the drudgery. Vice Chairperson indicated that designing and provision of gender friendly machinery may be linked to TNAU and Department of Agricultural Marketing.
- 13) ICDS and Women Development Corporation may jointly study the impact of millet before and after implementation of the scheme in various areas like a) severely malnourished areas, b) malnourished areas and c) well nourished areas and the same may be documented.
- 14) The millets consumption may be popularized through documentary film by using Doctor's messages, farmers' representatives, film actors etc., through Department of agricultural Marketing. Additional Chief Secretary (Planning and Development) suggested for one minute version of the film to have fast reach through TV advertisement. Food based on millets may be supplied in Dhaba as piloted in the Villupuram-Salem National highway by the Tamil Nadu Women Development Agency.

- 15) Vice Chairperson indicated that in the millets promotion programme, department of agriculture is the most important player and requested the agriculture department to explore the possibilities of promotion of millets production in ongoing schemes.
- 16) Vice Chairperson summed up the salient features of the deliberations and requested that the review of success of the deliberations may be conducted once in three months for effective tracking and guiding the programmes on millets promotion.

### List of Participants

Presentation on Promotion of Small Millets by DHAN Foundation is held under the Chairmanship of the Hon'ble Vice-Chairperson, State Planning Commission on 24.01.2013 at 11.00 AM in the conference hall of SPC.


S.No	Name & Designation	S.No	Name & Designation
1	Tmt Santha Sheela Nair, I.A.S., (Retd.), Vice Chairman, State Planning Commission, Chennai-600 005	2	Dr K.Ramasamy, Ph.D., Member(Agriculture & Irrigation), SPC & The Vice Chancellor, Tamil Nadu Agricultural University, Coimbatore – 641 003
3	Dr.R.Vijaykumar, Ph.D., IAS., Additional Chief Secretary to Government, Planning, Development and Special Initiatives Department, Chennai-600 009.	4	Thiru.M. Balaji, IAS, Member-Secretary, State Planning Commission, Chennai -600 005.
5	Tmt Meenakshi Rajagopal, IAS., Principal Secretary/Special Commissioner, Integrated Child Development Services, Pammal Nallathambi Street, Taramani, Chennai -600 113.	6	Tmt M.P.Nirmala, IAS., Secretary to Government, Cooperation, Food & Consumer Protection Department, Secretariat, Chennai - 600 009
7	Thiru.Senthil Kumar, IAS., Special Secretary to Government, Health and Family Welfare Department, Secretariat, Chennai-600 009.	8	Thiru Anil Meshram, IAS., Director of Agricultural Marketing and Agri.Business, CIPET Road, Guindy, Chennai – 600 032.
9	Tmt.M.Susila, Special Officer(PMC) Civil Supplies Department, Chennai 5	10	Thiru. R.Rajan Addl. Director Of Agriculture(GOI Schemes), O/o Commissioner of Agriculture, Chennai
11	Dr.S.Selvam, Executive Director, Agri. Marketing Intelligence & Business Promotion Centre	12	Thiru.R.Gnanaoli Deputy Director (Paddy & Millets) O/o Commissioner of Agriculture Chennai 600 005

S.No	Name & Designation	S.No	Name & Designation
	Trichy		
13	Thiru.I.Bhoopathi Deputy Director of Agriculture(Agri. Business), Krishnagiri	14	Thiru.S.Subramanian, Deputy Director of Agriculture(Agri. Business), Perambalur
15	Thiru.S.Chandran Deputy Director of Agriculture(Agri. Business), Sivagangai	16	Dr.B.Shanthi Deputy Director(Health) ICDS, Chennai-113
17	Tmt.C.Malarvizhi, Assitant Director(NMP), O/o Directorate of Social Welfare		
	<b>State Planning Commission</b>		
18	Thiru. Sugato Dutt IFS., Head of Division(Land Use)	19	Thiru.P.Selvarajan Head of Division(Rural Development & District Planning)
20	Tmt.Navaneetham Head of Division(Health and Social Welfare)	21	Dr.K.R.Jahanmohan Head of Division(Agriculture Policy & Planning)
22	Thiru.R.K.Haroon Planning Officer Agriculture Policy & Planning	23	Thiru.Boopathy Mohan Programmer
	<b>Institutions/NGOs</b>		
24	Dr.A.Nirmalakumari Professor (Breeding) Department of Millets Tamil Nadu Agriculture University,Coimbatore	25	Thiru. M.P. Vasimalai Executive Director, DHAN Foundation Madurai 625 010
26	Thiru. M.Karthikeyan, Programme Leader, DHAN Foundation Krishnagiri- 635 001	27	Tmt.R.Sumathi, DHAN Foundation Chennai
28	Thiru. A.Madhankumar DHAN Foundation Madurai	29	Thiru. M.Palanisamy Programme Leader, DHAN Foundation Madurai 625 010
30	Thiru. P.A.Viswanathan Dhann Foundation Chennai	31	Thiru. K.Somasundaram, Dhan Foundation Anchetty, Krishnagiri
32	Thiru.Ramasubramanian, Consultant,SRLM, Chennai	33	Thiru.Phlip, M S Swaminathan Research Foundation 3rd Cross Street, Institutional Area, Taramani, Chennai -600 113.
34	Thiru.T.R.Prabhakaran		

<b>S.No</b>	<b>Name &amp; Designation</b>	<b>S.No</b>	<b>Name &amp; Designation</b>
	Economist, MSSRF,Chennai		
	<b>Farmers</b>		
35	Thiru.M.Murugesan Farmer, Anchetty, Krishnagiri	36	Tmt.Eramma Farmer, Anchetty, Krishnagiri

Annex - 3

Proceedings of SPC-workshop on Millets Promotion-Strategies and Way forward



Tel. No. : 28545460  
FAX : 044 - 28545485  
STATE PLANNING COMMISSION,  
"EZHILAGAM"  
CHEPAUK, CHENNAI 600 005.

From  
The Member Secretary(FAC),  
State Planning Commission.

To  
Thiru. M.P. Vasimalai,  
Executive Director,  
DHAN Foundation.

Sir,

**Lr.No.2360 /SPC/APP/2014 Dated 25.07.2014**

Sub: SPC- Workshop on "Millets Promotion – Strategies and Way Forward" - held on 02.07.2014 – Summary Record of the Discussion-Communicated – Reg.


Ref: This office letter Even No. dt.13.06.2014.

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The summary record of discussion of the Workshop on "Millets Promotion – Strategies and Way Forward" held on 02.07.2014 is sent herewith for your kind perusal and necessary action.

Encl: 1

Yours faithfully,

  
for Member Secretary.

*Palani*  
*for discussion today*  
*25/7/14*

**Summary Record of Discussion of the Workshop on “Millets Promotion – Strategies and Way Forward” held on 02.07.2014 at SPC under the Chairmanship of the Vice Chairperson, SPC**

List of Participants enclosed.

**Dr.Sugato Dutt, IFS, Member Secretary (i/c), State Planning Commission** welcomed the participants and briefed about the importance of area expansion under millets and productivity of millets so as to achieve the desired nutritional security and various initiatives taken up by SPC.

**Tmt. Santha Sheela Nair, IAS (Retd.), Vice Chairperson, State Planning Commission** in the opening remarks elaborated the initiatives of the State Planning Commission in connection with the increase in area under cultivation of millets and creating awareness on the consumption of millets. She further elaborated about the workshops conducted by SPC at regular intervals and outcome of the workshops. She also pointed out that though more initiatives are being taken up to increase the area & production of millets, processing and manufacturing ready to eat/consume millet based products, much more focus has to be devoted in technique/style of presentation of millet based recipes. She insisted that to create more demand for millets, it is very important that the millet based recipes should be presented in an attractive form, palatable and in delicious taste which would induce the consumers especially the younger generation and middle class population to change their preference to millets over junk foods. The importance of packing and presentation aspects was emphasized and indicated how it contributes in spurt of sales of the junk foods viz, chips, pizza and burgers. In this context, she pointed out the important role of chef/celebrities/professionals in hospitality industry in popularizing the recipes. She insisted that the strategies for taking the production, processing and consumption of millets forward should be implemented more intensively and at fast track mode.

During discussion, **Thiru. S.Krishnan,IAS., Principal Secretary to Government(P&D), Planning, Development and Spl. Initiatives Department** pointed out that there are sophisticated markets available for the millets and however to ensure uninterrupted supply both in commercial markets and government outlets, the cultivation area and production should be increased and requested the TNAU to concentrate on extensive research on breeding. Further, while commercialisation, he



cautioned that the millet cultivators especially, the tribal farmers should keep in mind the nutritional security available to them in this cultivation.

**Dr.K.Ramasamy, Member (Agri.& Irrigation),SPC** insisted that as the Varagu, Samai, Thinaï and Kudiraivali millets are specific to Tamil Nadu, TNAU has to concentrate more on its conservation and preservation besides extensive research on breeding. While discussing on the limited cultivation of millets by the tribals for their own consumption and to some extent for open market, he pointed out that they prefer to consume millets in raw form due to its lower shelf life in its processed form.

**Dr.M.Rajendran, IAS., Director of Agriculture**, indicated that the production of millets for the year 2013-14 is expected to be about 25 lakh tonnes which contributes significantly to food grains production achievement. Further, he also informed that to increase the productivity of millets, the Department is taking initiatives to increase the Seed Replacement Rate of millets which is low at present. He also informed that it has been proposed to distribute 200 machines free of cost for processing of millets covering 25 districts under IAMWARM Project.

**Thiru M.P.Vasimalai, Executive Director, DHAN Foundation**, briefed about the outcome of the study on Small Millets undertaken by the foundation. He mentioned that the area under millets has been increasing and pointed out that kudiraivali emerges as a contingency crop in the event of delayed/failure of monsoon and when tank irrigation is not adequate. He further mentioned that though the area is increasing, the productivity is still at low and this necessitates a suitable intervention in the seed system like promoting seed farmers, ensuring timely availability of quality seeds etc. In the phase of processing, mechanization and postharvest is important. While considering mechanization, more care should be exercised to identify the stage and kind of mechanization. He further insisted that as varietal extinction is more in the small millets (for eg., kattan samai, nettan samai)varieties specific to Tamil Nadu and which are not found elsewhere in the country, timely and suitable intervention is needed to preserve and conserve these varieties. On the consumption part, though the people start to include millet in their food, it is yet to register its impact on the minds of younger generation and hence more awareness creation should be done among them.



**Thiru M.Karthikeyan, Principal Investigator-India, RESMISA Project,** DHAN Foundation made a presentation on “Possible Policy Interventions for Promoting Small Millets – Learnings from RESMISA Project”. In his presentation, he outlined the need for promoting small millets and the role of its nutrient, medicinal properties in addressing the malnutrition, prevention/control of non-communicable, life style related diseases. He explained the outcome of the project implementation in Tamil Nadu -showed production enhancement issues like fast declining crops and varietal diversity, low yield, high drudgery in processing particularly for women and less developed markets and the subsequent production enhancement evidences *viz.*, yield enhancement by 15-20% through participatory varietal selection and by 10-25% through location specific sustainable agriculture production practices, benefits of usage of low cost implements, reduction in drudgery through mechanization and increase in farm gate price through proper linking of markets. He also explained about the consumption enhancement issues in production areas, in market based consumption and in state support based consumption and also the evidences seen in addressing these issues as the result of the implementation of the above project.

**Dr.N.Varadharaju, Professor, TNAU Coimbatore** made a presentation on “Enhancing the Productivity of Millets through Demonstrations”. In his presentation he explained the trend in area, production and productivity of millets in Tamil Nadu from 1980’s to 2011-12. He also explained how the millets are smart over other crops due to its lower water requirement, low fertilizer and other farm inputs usage characteristics, besides ensuring nutritional security and as a promising contingency crop in the event of monsoon failure. He also listed the various activities undertaken by the University *viz* front line demonstrations (crop wise), conduct of field day and trainings in promotion of millets.

Video Presentation on the operation of various machineries designed by TNAU in millet cultivation, harvest and processing was also made by **Dr. R. Ravikesavan, Professor and Head, Department of Millets, TNAU, Coimbatore.** A presentation on value addition of small millets was made by Dr.D.Malathy, Professor, Food Science and Nutrition, TNAU, Coimbatore. The nutritional composition of varagu, samai, ragi and kudiraivali and traditional millet recipe were discussed in detail. TNAU has standardized innovative recipes made from traditional millets *viz.*, flaked and puffed

small millet preparations. It was also informed that women entrepreneurs have increased their monthly income upto 30% by commercializing millet value added products and millets can create employment generation for small and medium entrepreneurs also.

The experiences obtained through pilot project on possibilities of promoting consumption of small millets through feeding in ICDS centers, Srikakulam district, Seemandra State was shared by a NGO – WASSAN, Hyderabad. The pilot project introduced millet based feeding to 160 children of 3 to 6 years age children in 12 ICDS Centers. Bajra & Korra based feeding is served on 8 days each in the month. On the remaining 9 days rice based meal is served. All other ingredients remain the same as per norms of the government. Supply of egg as per norm is not disturbed. It was informed that ragi based recipes provided 5 times more calcium and 46% more iron than the existing rice and wheat based food served. Also, the energy and protein content of the millet based meal is higher than rice based meal and it contains almost 50% lower fat than the existing recipes. It was suggested that the introduction of millets in the feeding under the government schemes and inclusion in the PDS along with rice & wheat is the best strategy which will trigger the enhanced cultivation of millet by the farmers and its consumption by a larger section of the people both poor and elite.

**Dr. N.Tamilselvan, Program coordinator, Krishi Vigyan Kendra, Dharmapuri** highlighted the role of KVK in promotion of millet cultivation in Dharmapuri district. It was informed that through training on ICM and Value addition of minor millets, about 3335 farmers were benefitted. Also, KVK was instrumental in formation of Dharmapuri District Minor Millet Farmer Producer Company Ltd. Mr. Palanimurugan the president of the Farmer (Millet) Producer Company also highlighted the importance of company in increasing the farmers' income.

**Dr. Chef K. Damodaran**, who is the State's Ambassador for propagation of millets suggested for sustained availability of millets in the cooperative and other stores as it becomes more imperative in context of increased awareness among the consumers owing to popularization of millet based recipes. He also stressed the importance of packaging and presentation of millet foods, so as to attract the youth.



The farmers from Javadhu hills explained about the constraints in millet production and processing of millets. The farmers requested for establishment of common processing facility for processing and value addition of millets right in the hills itself as these places does not have adequate transport facilities. Also, the farmers sought assistance from government for land levelling as these have higher degree of slopes and levelling becomes more expensive operation.

**Major outcome/suggestions**

- To increase area of millets, in the context of anticipated water shortage, cultivation of millets as mixed cropping may be encouraged. Popularise the millet as contingent crop in the event of drought.
- Kudiraivali is an excellent crop that ideally suits for the water stress conditions and short duration nature of this crop provides ambient opportunities for inclusion of this crop in the contingency plan to mitigate the drought.
- As Millets fit well in the current fallow land category, appropriate initiatives may be taken to replace the current fallows with millets. The Karnataka Model of extending financial assistance for addition of organic manure may be emulated in the State.
- To increase productivity, suitable intervention in seed system like promoting seed farmers, ensuring timely availability of seeds may be undertaken
- Seed Replacement Rate is low in case of millets. To ensure availability of quality seeds, special attention may be given on increasing the SRR of millets. Coordination among the departments and Research Institutions is stressed in this regard.
- Huge reduction in the area of millet cultivation, especially panivaragu is a great cause of concern and TNAU may design special seed multiplication programme for small millets like Varagu, Samai, Tinai and Kudiraivali in general and for panivaragu in particular.
- As there is a varietal extinction of small millets, more intervention is needed for conservation of the same.

- As Varagu, Samai, Thinai and <sup>1</sup>Kudiraivali are the special millets of Tamil Nadu, extensive research on breeding of these varieties should be undertaken.
- Adequate care/attention should be given to retain nutrients during processing of the millets as millet specific machines are the need of the hour to achieve the above mentioned goal.
- While going for mechanization, especially for harvest, post harvest and processing operations, kind and stage of mechanization should be identified with utmost care with special reference to the nature of the millets.
- Similar to provision of millet cookies in ICDS centres, the introduction of millet based recipes in government run canteens especially Amma Unavagam, besides popularization, may pave way for creation of enhanced demand for millets.
- The educational institutions may resort to provision of millet based meal for the hostel inmates and as a first step, they can ensure provision of atleast one such meal per week.
- The commercialization of millets should be done with great caution and the existing nutritional security of the millet cultivators ,especially, tribal farmers should be safeguarded.
- Popularisation of millet based recipes in the common understanding of the middle class population and poor of the urban areas should be in such a way that these recipes can be preferred as an alternative of rice and wheat rather than on medicinal/health perspective.
- Awareness creation should result in sustained inclusion of millets in food habits which should be ensured with uninterrupted market availability both in commercial markets and government amudham outlets.
- Organisation of Millet Melas in urban areas may be done in collaboration with Municipal Corporations.
- While promoting bulk food including all the 4 millet crops viz, varagu, samai, thinai, kudiraivali, extension should be more cautious not to disturb the already existing nutritional security available in the rice/wheat based food habits of the people.

- Formation of more Farmer Producers Companies like Dharmapuri model which facilitate channelizing all the strategies in increasing the area, production, processing, value addition, marketing and consumption of millets in a fruitful manner to the advantage of both producers and consumers may be considered.
- It has been decided to form a core group to track the developments in millets promotion in the State and to draft strategies for enhancing the production and consumption of millets with representatives from all the line departments which will be coordinated by Dr.K.R.Jahanmohan, Head of Division, APPD, SPC.

Sd/- xxx  
Vice Chairman, SPC.



**List of participants for the Workshop on “Millets Promotion – Strategies and Way forward” on 02.07.2014**

S.No	Name & Designation
1.	Tmt. Santha Sheela Nair, I.A.S.(Retd.) Vice Chairperson, State Planning Commission, Chepauk, Chennai-600 005.
2.	Dr. K.Ramasamy,Ph.D., Member(Agriculture & Irrigation),SPC & The Vice Chancellor, Tamil Nadu Agricultural University, Coimbatore – 641 003.
3.	Thiru. S. Krishnan,I.A.S., Principal Secretary to Government, (Planning & Development), Planning, Development and Special Initiatives Department, Secretariat,Chennai-600 009.
4.	Dr. Sugato Dutt, I.F.S., Member Secretary (FAC), State Planning Commission, Chennai – 600 005.
5.	Dr. M.Rajendran,I.A.S., Director of Agriculture, Chepauk, Chennai – 600 005
6.	Thiru C. Rajendran, I.A.S., Director of Agricultural Marketing and Agri.Business,(i/c), CIPET Road, Guindy,Chennai – 600 032.
7.	Thiru. M. Shyamsundar, Additional Secretary to Government, Cooperation, Food and Consumer Protection Department, Secretariat, Chennai-600 009.
8.	Dr. N. Chitra, Additional Director (PHC), Directorate of Public Health & Preventive Medicines, DMS Complex, Chennai -600 006.

9.	Tmt. G.Jeyalakshmi, Joint Director(i/c),(NMP) Commissionerate of Social Welfare & Nutritious Meal Programme Department, Chintahthripet, Chennai – 600 002.
10.	Dr. S. Prathaban, Joint Director of Agriculture (Regulated Market), Directorate of Agricultural Marketing and Agri.Business,(i/c), CIPET Road,Guindy,Chennai – 600 032.
11.	Dr. Claribel D. Ezekiel, Consultant, Tribal Development, TNState Rural Livelihood Mission, Annai Theresa Mahalir Vaalagam, Nungambakkam High Road, Chennai-600 034.
12.	Dr.R.Ravikesavan, Professor & Head, Department of Millets, Tamil Nadu Agricultural University, Coimbatore – 641 003.
13.	Dr. N. Varadharaju, Professor, TNAU, Coimbatore.
14.	Dr. D. Malathi, Professor (Food Science & Nutrition) Post Harvest Technology Centre, TNAU, Coimbatore.
15.	Thiru P.Selvarajan, Head of Division(RD &DP), State Planning Commission, Chepauk, Chennai – 600 005.
16.	Dr.K.R.Jahanmohan, Head of Division(APP), State Planning Commission, Chepauk, Chennai – 600 005.
17.	Dr.Chef.K.Damodaran, No.10,Kannadasan Street, Rengarajapuram, Chennai – 600 024.
18.	The Programme Coordinator, Krishi Vigyan Kendra, Papparapatti, Dharmapuri District 636 809.

19.	Thiru. A Anderson Amalan Kumar, Assistant Professor, Krishi Vigyan Kendra, Pappaparapatty.
20.	Thiru. K. Mohan, Agricultural Officer, Secretariat, Chennai -600 009.
21.	Thiru. R. Muralidharan, Agricultural Officer, Directorate of Agricultural Marketing & Agri.Business, Guindy, Chennai - 32.
22.	Thiru R.K.Haroon, Senior Planning Officer, State Planning Commission, Chepauk, Chennai - 600 005.
23.	Thiru. M.P. Vasimalai, Executive Director, DHAN Foundation.
24.	Thiru.N. Rajasekaran, Programme Leader,DHAN Foundation, Madurai.
25.	Thiru. T. Dhanabalan, Programme Lead, DHAN Foundation, Madurai.
26.	Thiru. M. Palanisamy, Programme Leader, DHAN Foundation, Madurai.
27.	Thiru. M. Karthikeyan, Programme Leader, DHAN Foundation, Krihsnagiri.
28.	Tmt. Salome Yesudas, Consultant, Dhan Foundation, Chennai.
29.	Thiru. H.R. Prakash, Director, AFTIC, Kotturu Srikakulam District, Andhra Pradesh.
30.	Tmt. M. Periyammal, Location Researcher, DHAN Foundation, Madurai.
31.	Ms. M. Nadiya, Location Researcher, Jawadhu hills, DHAN Foundation.
32.	Thiru. K. Somasundaram, Programme Associate, DHAN Foundation, Anchetty.



33	Thiru. Ananthasayanan ASHA/Restore, Chennai - 600 020.
34	Thiru. G. Prakash, Tamil Nadu Pudhu Vazhvu Project,
35	Thiru. M. Subramaniam, Tamil Nadu Pudhu Vazhvu Project,
36	Thiru. Chinnaswami, Farmer, Jawadhu hills.
37	Thiru D. Madeswaran, Farmer, Anchetty, Krishnagiri District.
38	Ms. M. Annalakshmi, Farmer, Madurai



## Annex- 4

### Proceedings on “National Consultation on Promotion of Small Millets”

#### 1 Background

Enhancing the utilization of small millets among the common people is a necessity, considering the various malnutrition and non-communicable diseases plaguing the country. In the recent times millets as a theme has been getting widespread attention and initiatives are taken by various kinds of actors. But these happen in isolation and not enough for addressing the multiple constraints related to demand and supply of small millets which are characterized by low technology application and poorly developed markets. What is needed to jump start to reach a viable scale is a comprehensive and integrated development strategy aiming at demand stimulation, increasing production, developing local processing infrastructure and local market development. Such an integrated action on promotion of small millets will be possible only if all the concerned stakeholders- *small millet growers, consumers, seed companies, aggregators, small and large scale processors, food companies, manufacturers of machinery relevant to small millets, development and extension agencies, research agencies and policy makers*- join hands and work together in an innovative way. To kick start such a process and to create a platform for all the stakeholders to come together for an in-depth discussion on promoting small millets for food use on priority basis, a national level consultation was organized on the theme of promotion of small millets by Revalorising Small Millets in Rainfed Regions of South Asia (RESMISA) Project on August 5-6, 2014 at Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu. The consultation workshop had the below three purposes.

1. To bring together all the stakeholders at the national level and to create an atmosphere for interaction related to small millets,
2. To create an environment of mutual understanding on the current status, issues/constraints faced and the ways forward at each stakeholder category, including what they expect from other stakeholder category and from the State and
3. To generate actionable points and policy recommendations.

Around 125 participants including different stakeholders related to small millets and partners of the RESMISA project namely DHAN Foundation (DHAN), Tamil Nadu Agricultural University (TNAU), All India coordinated small millet improvement project (AICSMIP), Watershed Support Services and Activities Network (WASSAN) and Canadian Mennonite University (CMU) participated (Annex-I).

#### 2 Process followed

Intensive efforts were taken to identify respective stakeholders and they were briefed about the purpose of the consultation meeting. Before the event, information was sought from the participants through questionnaire on their engagement related to small millet, its current situation, issues/important constraints faced by them and suggestions/ ways to address those constraints. Further experts were engaged for synthesizing the current situation and the issues from the perspective of each stakeholder category into a status paper which was shared in the event.

The inaugural session of the event set the scene for the consultation by laying out the purpose of the event and expected results. As the process followed in the event was considered critical for generating the outcomes of the event with respect to the present status of each stakeholder, support expected by the different stakeholders from each other and also from the Government, an hour time was given for intra-stakeholder interaction to brief the process to be followed in the stakeholderwise sessions. This session was facilitated by a person who had clear understanding about the process part. Each stakeholder got introduced and familiarized with each other, and discussed on their current status, issues and challenges. This interaction paved way for a common understanding among the each stakeholder category. The seating arrangement was also done in such a way that each and every stakeholder sat as a group. This briefing session was followed by individual stakeholder sessions. For facilitating the sub-group discussion each sub-group had a facilitator who had good knowledge on the purpose of the event. The facilitators ensured that self introduction of the participants happened and they got familiarized with each other to make them function as a group. For handling every session moderators were identified and they were briefed about the process to be followed for ensuring effective interaction among the stakeholders.

Each stakeholder session started with the brief presentation on the current status and issues pertaining to that stakeholder category compiled through prior interaction and/ or literature review by the experts. This was followed by direct presentation of the representatives of concerned stakeholder groups on the current status, issues faced by them and support expected by them from other stakeholders and Government. The other stakeholders also were asked to reflect on the presentations made and share their suggestions/constraints too. The other important stakeholders namely development agencies (NGOs, extension departments, etc.), researchers and policy makers also responded to the demand placed on them and also shared their suggestions. The content generated through the above process was synthesised stakeholderwise and was shared during the plenary session at the end of the meeting. Thus intra-stakeholder and inter-stakeholder interaction happened resulting in generation of much useful information. The detailed agenda of the meeting is given in Annex-II.

An exhibition was also organized in the meeting venue in which the various participants displayed their products and works done with respect to small millets. Video interviews of some of the participants were done to capture their perception on the current situation, issues and constraints and their expectations and demands.

### **3 Inaugural Session**

The inaugural session of the National consultation on promotion of small millets started with the prayer followed by welcome address by Dr. Malathi, Convenor, TNAU. This was followed by lighting of lamp by the dignitaries. Mr. M.Karthikeyan, Principal Investigator, RESMISA project, briefly shared the need for the consultation meeting in the current scenario of malnutrition, the need for promoting small millets, and the need for collective actions across the stakeholders for making large scale promotion possible. He also shared the specific purposes and the expected outcomes of the consultation meeting. He sought the active participation of all the participants to make the event successful.

Mr. M.P. Vasimalai, Executive Director, DHAN Foundation described NCPSM as a unique attempt to bring all stakeholders to a common platform to address constraints and opportunities for the promotion of small millets. He said that promotion of small millets can be increased by focussing on 4Cs: Conservation, cultivation, consumption and commercialization. For this an integrated approach by the different stakeholders including Government, academic institutions like TNAU and the development organizations is needed. Inclusion of small millet diets in the Government food and nutritional schemes and promotion through market-led and people-led program will be of great help in achieving the purpose. He also wished this stakeholder meeting to be held on a regular basis, by initiating an integrated stakeholder forum to promote small millets.

In his special address, Dr. Kirit Patel, Canadian Mennonite University, Canada, shared about the positive impact of the RESMISA project in terms of involving different partners across South Asia and Canadian universities. Quoting a study made through the project he said 'if India would implement National Food Security Bill and decides that every eligible household should avail at least 1kg of coarse grains, the present production scenario will not support it'. He also expressed caution that if price of coarse grains go up due to market demand, small millet growers would sell it in the market rather than consume, as they get food grains like rice at much subsidized cost. He said that encouraging both production and local consumption is crucial in nutritional security point of view. In the inaugural address, Dr. K. Ramasamy, Vice-Chancellor, TNAU shared about the efforts being taken by TNAU for promoting of small millets. He

also said that small millets currently are in demand and their production is less compared to market demand. However the local consumption is low and many efforts had to be taken to ensure that. He told that efforts are being taken by the university to produce nutritionally superior varieties of small millets, developing suitable processing machine and value-added products to enhance production and consumption of small millets. He highlighted the need for advancing research to address the various constraints faced by small millets stakeholders.

The inaugural session concluded with vote of thanks from Mr. M. Palanisamy, DHAN Foundation.



Figure-1: Inaugural speech by Dr. Ramasamy, VC, TNAU, Coimbatore

## 4 Outcomes of the Stakeholders Consultation

The inaugural session was followed by stakeholderwise sessions in the following order:

1. **Stakeholder Session-1:** Issues impacting Production, Productivity and Profitability (PPP) of Small Millets
2. **Stakeholder Session-2:** Recent developments in farm machinery and agricultural implements aiding in small millets production and processing.
3. **Stakeholder Session-3:** Marketing Channels and Pricing of Grains in Small Millets
4. **Stakeholder Session -4:** Value addition and Demand generation

The outcomes of the discussions which happened during each stakeholder session, which led to content generation regarding the current status, issues and constraints and their needs is presented here

#### **4.1 Small Millet Growers: Issues and Opportunities**

A lead paper on current status, issues and constraints with respect to production, productivity and profitability of small millets compiled from the interaction with the farmers in six sites of four states was presented by Dr. C.S.P. Patel, DHAN Foundation

([http://www.dhan.org/smallmillets/docs/presentations/Production\\_Productivity\\_and\\_Profitability\\_of\\_small\\_milletts.pdf](http://www.dhan.org/smallmillets/docs/presentations/Production_Productivity_and_Profitability_of_small_milletts.pdf) ). He shared the following trends and the issues related to small millets cultivation:

1. The area under small millets cultivation has decreased over the years at a rapid pace and replaced by rice, ginger, potato and other vegetable crops in Semiliguda, Odisha and Bero, Jharkhand and groundnut at Anchetty, Tamil Nadu (Baseline survey, 2011-12).
2. Majority of the farmers contacted in the study opinioned decrease in area under small millets during the last 10 years.
3. Productivity of the small millets is found to be very low in the RESMISA project sites and as low as 125 – 225 Kg/ac in case of little millet.
4. The irregularity of rainfall as well as late onset of monsoon played major role in the reduction of small millets production.
5. There is lack of availability of site specific quality seeds. The farmers generally use the local varieties and sow the same seeds year after year. Proper seed selection practices to ensure quality of seeds was also lacking. Moreover, there is lack of proper seed system on behalf of Government for distribution of quality seed to the farmers in interior areas where small millets is cultivated.

Later Dr. Nanja Reddy, AICSMIP, Bangalore also presented a paper on “Effective intervention for impacting production, productivity and profitability of small millets”. He shared that, finger millet is the only small millet which had much research focus leading to release of many improved varieties, while such wider range of improved varieties are lacking in other small millets. He insisted that small millet growers need to adopt appropriate soil and water conservation methods, and timely crop management practices for increasing productivity. For example, an experiment under taken by AICSMIP revealed that weeding in (35-40) days after sowing (DAS) can increase yield more than two times than un-weeded plots and this practice of timely weeding is lacking on part of the farmers.

The farmers who came from Jawadhu Hills, Anchetty, Peraiyur, Bero and Semiliguda also shared their concern regarding cultivation of small millets. The other stakeholders present also reflected on their areas of concern with respect to cultivation, production and productivity of small millets. The important points shared by the participants are given below.

##### **(i) Constraints/Issues**

- Lack of improved machineries for small millets for performing inter-cultural operations, harvesting, threshing and de-hulling. Most of the work is done manually which involves lot of

drudgery, especially during harvest and processing small millets, forcing farmers to go for alternate crops. Even the available machineries for inter-cultural operations are not put to proper use, basically due to lack of awareness. ( Somanath Oran, Farmer, Jharkhand)

- Lack of proper infrastructural facility like threshing yard in the village
- Wild animal damage (wild boars and elephants) is very high in villages adjacent to forests. The Forest Act and restrictions are not in favour of the farmers. Farmers do not know how to tackle this problem ( Ms. Maheswari, Farmer, Anchetty)
- Lack of local infrastructure for processing small millets, forcing farmers to sell the unprocessed produce to the aggregators/whole salers at lesser price ( Ms.Maheswari, Anchetty and P.S.P.Ramasamy, Peraiyur, Tamil Nadu)
- Lack of Government support to promote small millets (Mr. Prasanta Mahanty, Nirman, Odisha)
- Lack of organised marketing channel (Mr. Dhanbalan, DHAN)
- Infrastructure for transport is lacking in interior villages

## **(ii) Ways to address constraints and issues**

- Identifying suitable varieties for a particular region/site and promoting such varieties through farmers participation (Dr. Nirmala Kumari, Researcher)
- Quality seeds are not available in time and it is necessary to avail quality seeds to the farmers on time. Farmers should be motivated for seed production and adopt improved variety as local varieties have lots of mixtures (Mr. J.H. Raghul, Development Agency)
- It is necessary for skill up gradation of small millet growers for adoption of timely and appropriate crop management practices like sowing in time, crop rotation with legumes, inter-cultural operations, weeding in time, changing cropping pattern like inter-crop, mixed crop, Sequence cropping, etc. Enhancing soil and water conservation practices such as summer plough, ploughing across slope, erecting small section of bunds in the plot, opening at water conservations, etc. are to be adopted (Dr. N. Reddy, Researcher)
- Creating access to, low cost inter-cultural machines, harvesting and de-hullers in the place of production
- Food industries need to work in collaboration with the small millets growers and support for high production. The agreement between the small millet growers and food industries will increase the confidence level of the farmers to grow more area under small millets (V. Vashudevan, Government Agency)

## **(iii) Expectations and demands on other stakeholders**

### **a) Supports expected from researchers**

- Solution to address peacock damage
- Research needs to be carried for developing and popularizing context specific and higher improved varieties.(Dr. Nirmalakumari, Researcher)
- Developing small scale harvester and threshers

### **b) Support expected from farm machineries fabricators**

- Develop and make available appropriate farm machinery to reduce drudgery related to small millet production and processing

### **c) Support expected from Government**

- Government need to take up policy and institutional changes to effectively address crop damage due to wild animals.
- Support to be given for setting up custom hiring services to avail harvesters and threshers in the production cluster.
- Regulated market to be established in production clusters (Farmer, Jawadhu Hill)
- Small millets produce to be procured by Government at a viable procurement price.
- Providing higher minimum support price and small millet focussed exclusive schemes by the Government ( which offers subsidy/incentive for small millet cultivation, ensures technological and market support etc.) to encourage farmers to go far small millet production and enhance the area under cultivation
- Creating local infrastructure for storage
- Supporting to form small millet growers' producer company to increase farm gate price realised by the farmers and to ensure local processing and value addition in production clusters (M. Palanisamy, Development Agency)
- Training and capacity building of small millet growers and demonstration of appropriate management practices which will be context specific.
- The production clusters of small millet to be given focused integrated support for development by the Government in the model of special economic zone. (Dr. Nirmalakumari, Researcher)
- Small millet production needs to be integrated with the existing programs of the government like National Rural Livelihood Mission and MKSP.

## **4.2 Small Millet Machinery Fabricators: Issues and Opportunities**

The status paper on farm machinery and agricultural implements aiding in small millets production and processing was presented by Dr. Ranganna, Emeritus Scientist (ICAR), PHT, UAS, Bangalore. In his presentation he shared that farm machinery can aid in increasing small millet growers' gross return 30 to 50 percent and reducing drudgery up to 30 percent. He also shared the issues faced by farmers due to lack of appropriate machinery, including reduction of area under small millet due to labour scarcity during harvesting and threshing of finger millet and sale of entire produce to market due to lack of proper de-hulling machines. Especially the de-hulling of little millet is so laborious that even to de-hull 2 kg little millet manually 90 minutes has to be spent.

Dr.N.Varadharaju, Professor & Head, Post Harvest Technology Centre, TNAU, in his presentation said that "Currently millets are manually harvested and threshing is done on the road. These operations are very time consuming, laborious and uneconomical. Small and marginal farmers are not able to invest on farm machineries." Farm machinery development need to be clubbed with training and demonstration programme in farmers' fields. He shared about Double Chamber Centrifugal Millet Dehuller developed by TNAU. Dr. Balasubramaniam, Central Institute of Agriculture Engineering shared about CIAE Millet Mill. Similarly, Mr. Udayagopal, Sri Venkateswara Engineering, Coimbatore and Mr. Rajasekar, AVM Engineering, Salem shared about experience and challenges in their profession. They expressed that unlike paddy, small millets are small in size and have different layers of husk that is difficult to be removed. Caution has to be exercised that the

grains are not broken while processing. The other stakeholders too reflected on the issue. The important points emerged in the presentations and follow up discussions are shared below.

### **(i) Current Situation**

- Harvesting machines were not developed exclusively for small millets
- Though the combined harvester and the harvesting cum binder machine for paddy can work for small millets, they are found to work well only under ideal situations
- Efficient whole plant threshers are not available for finger millet
- Other small agricultural implements, like seed drill, weeder's, land leveling instruments are available, but their usage is localized and the awareness, access and their usage is not widespread.
- Non-availability of de-hullers or low cost processing machines locally, forces the farmers to sell all their produce. This produce travel long distances for processing ultimately leading to higher price of the finished products.

### **(ii) Constraints/Issues**

- The small millet area under cultivation has drastically reduced and also scattered. Hence there is no widespread demand to sell more machinery. This hampers small scale machinery manufactures to produce machines on large scale, which in turn have an impact on the cost of the machine.
- The different types of small millets are in varied size and shape, which needs the machine to be fine tuned according to the local need.
- Currently no perfect machinery prototypes to suit small millet processing is available at low cost, though some machinery manufacturers and the researches in agricultural universities have come out with some near-to-perfection machines, which range in their efficiency from 60 to 80 %
- The produce from farmers hand comes without proper winnowing and cleaning which adds to the challenge of developing processing machinery

### **(iii) Suggestions to Overcome Constraints**

- It is necessary for large scale field demonstrations of new implements / machineries on '*operational research mode*' involving growers' feedback for fine-tuning and for popularizing them (Dr. B. Ranganna, Researcher)
- Developing household level farm machineries can be given priority and they need to be supported through Government subsidized schemes (S. Sadhanandham, Farmers' producer company)
- There is scope for the memorandum of understanding (MoU) with the Research and Development (R&D) institutions and farm machinery fabricators for speedy development and commercialization. The collaborative intervention will bring positive result in developing machineries suitable for the farmers (Dr. B. Ranganna, Researcher)

### **(iv) Expectations and demands on other stakeholders**

#### **a) Supports expected from Researchers**

- Research need to be taken to develop effective whole plant thresher and gravity separators



- Conduct study on different machinery model available and develop standards to guide the fabricators
- Instead of waiting for a perfect machine the researchers need to recommend the best available machine at present to the Government for promotion, since research is always a process of refining and further improvement (Dr.Nirmalakumari, Researcher)

**b) Specific suggestion to Government**

- Subsidy for machineries related to small millet production, harvesting and processing to facilitate large scale reach so that market demand is created for the fabricators.
- The ceiling for unit cost allocated for establishing processing facilities at the village level need to be raised to make it possible to provide better performing machineries (Dr. Nirmalakumari, Researcher)
- Support need to be given for developing prototype by the fabricators as research is taken up for the public cause and it would be difficult for the small scale fabricators to bear the cost of research ( Mariapan, Fabricator)
- Quicker and proper certification for machineries manufactured by small scale fabricators by the Government agencies to aid in their sales
- Tax concession for small scale machine fabricators

### **4.3 Small Millet Market Chain Actors: Issues and Opportunities**

The status paper on marketing channels and pricing of small millets was presented by Mr.T. Dhanabalan, Chief Executive, Kalanjiam Thozilagam Limited. The detail of the presentation is available on

[http://www.dhan.org/smallmillets/docs/presentations/Status\\_paper\\_on\\_marketing\\_channels\\_and\\_pricing\\_of\\_small\\_millets.pdf](http://www.dhan.org/smallmillets/docs/presentations/Status_paper_on_marketing_channels_and_pricing_of_small_millets.pdf). According to him, in Peraiyur farmers used to sell small millets to

market players immediately after harvest without retaining them for consumption. The farmers mostly supply grains which are not properly dried or cleaned creating problems in processing of these grains. Farmers also do not store them for long time due to lack of proper storage facility. The price of the produce is always dictated by the market player and currently ten to eleven chain actors involved from producers to consumers. Reducing this number of actors will be beneficial both to the farmers and also to the ultimate consumers and starting a producer company by the farmers can greatly help this process. Sophisticated processing mills are located in Theni, Tamil Nadu and also at Nashik were more number of such mills operates. The huge cost involved in transport, handling and investment cost on such sophisticated machines reflects on the final price of the small millet produce. Small millet processing units are not mostly available at local level and even the available units were not up-to the standard. Shelf life of the processed small millet is very low and they can be stored only for a month adding problems to the sellers. The high cost of the processed produce, lower shelf life and decreased consumption at local level and lack of knowledge on nutritional qualities on small millets among larger public are some of the factors that hinders the sale of small millets.

Mr.Dinesh from Earth 360 Ltd, Kadiri which procures, process and sells small millets and Mr.Murugesan from Timbatku collectives which has promoted a farmers organic cooperative society also shared their experience on direct procurement of small millets from farmers for processing and

marketing, through which farmers too got benefited. The important points emerged in the presentations and follow up discussions are shared below.

### **(i) Current situation, constraints and issues**

- Involvement of more than ten market chain actors in the marketing chain ultimately resulted in escalating the final price of the finished small millet products
- Farmers borrow from local aggregators or wholesalers and are forced to sell back their produce to them at the price they dictate
- The farmers do not also have local storage facilities to store and sell the produce when the prices are favorable
- High cost of processed small millet produce is the resultant effect of cost involved in long distance transport, too many market players, high investment cost on sophisticated processing machines and low shelf life of the processed grains

### **(ii) Ways to address the constraints**

Market chain actors play important role for the promotion of small millets in the era of competitive market. They need supports from all the stakeholders in certain aspects given below as.

### **(iii) Expectations and demands on other stakeholders**

Market chain actors need special attention from different stakeholders for promotion of small millets. As there is very low production of small millets as well as low awareness level of consumers, it needs heavy

investment on farm machineries, inputs for food product design and promotion of small millets. The following are some of the listed Government interventions for market chain actors.

#### **a) Support expected from researchers**

- Researchers have to develop technologies for increasing the shelf life of the small millets (Dr. N. Reddy, Researcher)
- Developing and popularizing varieties which have thinner husk and easy to de-husk
- Research is needed to improve the machineries in the dehuller assembly

#### **b) Support expected from farmers**

- Small millet growers need to produce surplus small millets with the adoption of improved management practices. This will lead higher production in the local level and hence opportunity for procurement for market chain actors. There is more competition among traders for procuring small millets and there is always volatile price in the market for small millets like Barnyard millet. Each farmer needs to cultivate 0.5 acre and above in order to meet the market demands ( S. Kandasamy, Traders and Madevan , Researcher, Erode )



**Figure-2: Stakeholders interaction**

- Farmers must ensure that the harvested produce is cleaned and stored, without dust, foreign material after proper winnowing and drying

#### **c) Specific recommendations to the Government**

- Create infrastructure for collective marketing
- Credit facility/working capital for setting up small millet enterprises/processing units at local level through existing small scale industries development programs
- Support for formation of farmers producer company of small millets and involving development agencies for easy and quicker reach
- Establish storage facility or set up warehouses for small millet to make stock based credit possible
- Tax holidays for small millets based processing units

### **4.4 Small millet related food industries: Issues and Opportunities**

The status paper on value addition and commercialization of small millets products was presented by Dr. Neena Joshi, HOD, Dept of Food Science and Nutrition, UAS, Bangalore. She highlighted the nutritional benefits of the small millets and advancement made in developing value added food products

([http://www.dhan.org/smallmillets/docs/presentations/STATUS\\_REPORT\\_OF\\_NUTRIENT\\_ANALYSIS\\_VALUE\\_ADDITION.pdf](http://www.dhan.org/smallmillets/docs/presentations/STATUS_REPORT_OF_NUTRIENT_ANALYSIS_VALUE_ADDITION.pdf) ) Followed by this a presentation was done by Mr. Prashant, Kottaram Foods, Bangalore, on the small millet products marketed by them. Mr. Sathyamoorthy, Dr Yes Aar team, Coimbatore shared his experience of setting up a medium scale food industry. Ms. Maragathavalli, Lakshmi Foods shared the practical constraints faced by a small scale food enterprise. The other participants too reflected on their experience of running enterprises. The important points emerged in the presentations and follow up discussions are shared below.

#### **(i) Current Status- Constraints and issues**

- Only limited players are in the market. Most of them are very small scale manufacturers of value added products like small millet flour, small millet mixes, ready to eat product (RTE) and ready to cook products ( RTC). They operate on a small scale with limited investment leaving them with less scope for advertising the produce.
- No specific support exists for small millet based food industries despite the nutritional superiority of small millets.
- Lack of awareness among the consumers about nutritional superiority of small millets and the consequent low demand from them

#### **(ii) Suggestions to Overcome Constraints**

- The judicious combination of small millets with pulses and other crops can increase more nutrition value.
- There is a need for innovative processing technologies to convert millet grains into liquid foods such as drinks of high nutritional quality and safety that has high consumer preference.
- Refrigeration, irradiation and hydrothermal treatment or a combination of more than one technique extend shelf-life of millet grains and their milling fractions as well as their food products.

- Edible coatings can be used as a method of preservation of food products and improve the stability of lipids and lipid containing foods, thus preventing the loss of sensory and nutritional quality.
- Since millets are gluten-free, they have considerable potential in foods and beverages that can be suitable for individuals suffering from celiac disease.” (Dr. Neena Joshi, Researcher)
- Development agencies as well as Government work on creating awareness among the consumers regarding the nutritional and health benefits of the small millets food products in their working areas. Training for recipe preparation and recipe demonstration programme is necessary for the local people. (Ms. Janaki, RTC and RTE retailer, Shri Parameshwari Health products, Thathaneri, Madurai)
- There is a need to provide millet based food products in the form ready to eat format. Incorporation of millets in cookies are widely accepted and having huge demands in market. In addition, value addition to minor millets not only offers variety, convenience and quality food to consumers, but also helps in revival of millet cultivation. By this we can avoid Junk Foods (Dr. P. Sathiya moorthi, Food Industry)

### **(iii) Expectations and demands on other stakeholders**

Food industries need several interventions from different stakeholders in terms of increasing small millet production at locality, promotion of small millets through different awareness programme etc. The expected support needed from other stakeholders are given below as

#### **a) Support expected from small millets growers**

- Supply quality produce free of dust and other foreign material , that will reduce the cost in processing

#### **b) Support expected from researchers**

- Do nutritional analysis of small millets recipes including bio-availability studies and share the results widely through scientific papers and technical bulletins.
- Develop standards for optimal policing of small millets to retain the nutrients.
- Researchers have to develop technologies for increasing the shelf life of the small millets (Dr. N. Reddy, Researcher)

#### **c) Support expected from market chain actors**

- Supply quality produce free of dust and other foreign material , that will reduce the cost in processing
- Ensuring regular supply of produce at a lower price
- Need based supply like supply of completely processed grains, semi-processed grains and broken small millet grains

#### **d) Support expected from Government**

- Manufactures of small millet based value added machinery should get R & D support from Government.
- Tax holiday for the next 10 years for small millet food industries

- Sales tax concession for small millet based food products.
- Support for getting credit on a priority basis at lower interest rate
- Support for exporting value added products
- Government need to take the role of positioning small millet products among the public through large scale promotional campaigns so that necessary demand is created for the food industries

## **5 Inclusion of small millets in public food programs**

The experience of inclusion of small millets in public food programs across the nation was shared by three presenters. Ms. Shabin from Pipal tree shared the recent initiative of Karnataka state Government to include finger millet in PDS in Southern Karnataka and the pilot project proposed for local procurement at taluk level to meet the PDS requirements ([http://www.dhan.org/smallmillets/docs/presentations/Pipal\\_Tree\\_A\\_Decentralised\\_PDS.pdf](http://www.dhan.org/smallmillets/docs/presentations/Pipal_Tree_A_Decentralised_PDS.pdf)). Mr. Sunny from WASSAN shared the experience of doing a pilot project on inclusion of small millets in ICDS at Srikakulam, Andhra Pradesh. Mr. Arumugam from Dept. of Agriculture shared about an innovative initiative by Madurai district administration related to promoting farmers food court for selling small millet products to the public. Participants appreciated these initiatives and said more such initiatives are needed in all the states. It was suggested that small millet products could be introduced in Amma canteen in Tamil Nadu.

## **6 Collective Action needed for Sustainable Promotion of Small Millets**

Few suggestions were made by the participants for collective action across the stakeholders and they are shared below:

- The interaction initiated need to be continued further to pursue the actionable points generated in the consultation meeting
- A steering committee has to be set up involving all stakeholders for taking forward policy action related to various suggestions generated in the meeting both at the state and central level
- An innovation platform needs to be created for better interfacing and collective research among researchers and other stake holders to address many constraints faced by the stakeholders identified in the meeting and to develop industry standards and protocols.

## ANNEXES

### Annex-1: Lists of participants

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4	Farmers from Anchetty	
5	Farmers from Semiliguda	
6	Farmers from Bero	
7	Farmer from Bargur	
<b>V</b>	<b>DHAN Foundation</b>	
1	Mr. M.P. Vasimalai	
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3	Mr. M. Palanisamy	
4	Mr. T. Danabalan	
5	Dr. C S P Patil	
6	Mr. Ramesh	
7	Mr. Bijaya Kumar Nayak	
8	Mr. Pashupati Pandey	
9	Ms. Liji	
10	Ms. Periyamma	

11	Mrs . Nadiya	
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## Annex-2: Agenda of “National Consultation on Promotion of Small Millets”

<b>National Consultation on Promotion of Small Millets</b> <b>Revalorising Small Millets in Rainfed Regions of South Asia (RESMISA) Project,</b> <b>TNAU, Coimbatore, India</b>		
<u>Program schedule</u>		
Day 1- 5 <sup>th</sup> August, 2014		
<b>08.30 AM</b>	<b>Registration</b>	
<b>I</b>	<b>Inaugural session</b>	
09.30 AM	Prayer	Dr. Malathi, Convenor, TNAU
09.35AM	Welcome address	
09.40 AM	<i>Inauguration by lighting of the lamp</i>	
09.50 AM	Brief introduction about the project and the event	Mr. Karthikeyan, Convenor, DHAN
10.15AM	Key note address	Mr. Vasimalai, ED, DHAN Foundation
10.30AM	Special address	Dr. Kirit Patel, Professor, Canadian Mennonite university, Canada
10.45 AM	Inaugural address	Dr. K. Ramasamy, Vice Chancellor, TNAU
10.55 AM	Vote of thanks	Mr. Palanisamy, DHAN
11 AM	<b>Tea Break</b>	
11.15 AM	<b>Intra-Stakeholder interaction (one hour)</b>	
<b>III</b>	<b>Inter- Stakeholder Sessions</b>	
	<b>Stakeholder Session 1: Issues impacting Production, Productivity and Profitability (PPP) of small millets</b>	Moderator: Dr. Nirmalakumari, Professor, Dept. of Millets, TNAU Co-moderator: Dr. Santhosh, Deshpande, Scientist, Research program on dryland Cereals, ICRISAT
	<b>Sharing by stakeholders</b>	
12.15 PM	Small millets growers’ perception of PPP	Dr. Patil, DHAN

12.35 PM	Voices from different states	
01.00 PM	<b>Lunch</b>	
<b>Sharing by other stakeholders</b>		
02.00 PM	Effective interventions for impacting PPP	Dr. Reddy, Senior Scientist, AICSMIP, ICAR, UAS- Bangalore
02.20 PM	Open forum - Expectations from other stakeholders - Suggestions for moving forward	Moderator: Dr. Palanimuthu, Head, PHT, UAS- Bangalore Co-moderator: Dr. Varadharaju, Professor & Head, PHC, TNAU
<b>Stakeholder Session 2: Recent developments in farm machinery and agricultural implements aiding in small millets production and processing</b>		
<b>Sharing by stakeholders</b>		
03.00 PM	Status paper on farm machinery and agricultural implements aiding in small millets production and processing	Dr. Ranganna, Emeritus Scientist (ICAR), PHT, UAS- Bangalore
03.30 PM	TNAU Double Chamber Centrifugal Millet Dehuller- Dr. Varadharaju, TNAU CIAE Millet Mill- Dr. Balasubramaniam, CIAE Mr. Sundararajan, Agromech, Coimbatore Mr. Harikrishnan, Kovai Engineering Works Pvt. Ltd., Coimbatore Mr. Rajasekar, AVM Engineering, Salem	
04.15 PM	<b>Tea Break</b>	
<b>Sharing by other stakeholders</b>		
04.30 PM	Open forum - Expectations from other stakeholders - Suggestions for moving forward	
<b>Day 2- 6<sup>th</sup> August, 2014</b>		
9.30AM	<b>Stakeholder Session 3: Marketing Channels and Pricing of Grains in Small Millets</b>	Moderator: Dr. Kirit Patel, Professor, CMU, Canada Co-moderator; Dr. M. Palanisamy, DHAN Foundation
<b>Sharing by stakeholders</b>		

10.00 AM	Status paper on marketing channels and pricing of small millets	Mr. Dhanabalan, CE, Kalanjiam Thozilagam Ltd., Madurai
10.20 AM	Sharing by Market actors- 4 - Mr. Dinesh, Earth 360 Ltd, Kadiri - Mr. Murugeshan, Timbaktu collectives - Sharing by few other market actors	
11.00 AM	<b>Tea Break</b>	
	<b>Sharing by other stakeholders</b>	
11.15 AM	Open forum - Expectations from consumers - Expectation from other stakeholders - Suggestions for moving forward	
	<b>Stakeholder Session 4: Value addition and demand generation</b>	Moderator: Dr. Saraswathi, Retd. Professor, Food Science Co-moderator: Dr. Shobana MDRF, Chennai
	<b>Sharing by stakeholders</b>	
11.45 AM	Status paper on value addition and commercialization of small millets products	Dr. Neena Joshi, HOD, Dept. of Food Science and nutrition, UAS- Bangalore
12.05 PM	Sharing by Food companies/ enterprises- 6 - Mr. Prashant, Kottaram Foods, Bangalore. - Mr. Sathyamoorthy, Dr Yes Aar team, Coimbatore - Lakshmi Foods - Sharing by few other food service providers	
	<b>Sharing by other stakeholders</b>	
12.45 PM	Open forum - Expectations from consumers - Expectation from other stakeholders - Suggestions for moving forward	
01.00 PM	<b>Lunch</b>	
02.00 PM	Introduction of small millets in PDS in Karnataka by Ms. Shabin, Pipal tree team Introduction of small millets in ICDS and schools- Experience sharing by Mr.Sunny, WASSAN Promoting food court for millets in Madurai by Mr. Arumugam, Dept. of Agriculture	Moderator: Mr. Vasimalai, ED, DHAN
03.00 PM	<b>Tea Break</b>	

03.15 PM	<b>Plenary and panel discussion</b>	Moderators: Dr. Kirit Patel, Canadian Mennonite University Mr. Karhikeyan, Convenor, DHAN
04.30 PM	<b>Closing session</b> <b>Vote of thanks</b>	Dr. Varadharaju, Prof. & Head, PHC, TNAU