Minutes of two days workshop:

IFAD-EU-CCAFS Project national Stakeholder Meeting

Underutilized Crop Species for Resilient Agriculture, Food and Nutrition Security

Date: 19-20 June 2015

Bhopal (India)

Background:

Bioversity International, in collaboration with Action for Social Advancement (ASA, India), organized a multi Stake holder meet to launch a three year Project entitled 'Linking agro biodiversity value chains, climate adaptation and nutrition: Empowering the poor to manage risk.

This workshop was organized in the framework of a new International UN project financed by IFAD, the EU and CCAFS entitled 'Linking agro biodiversity value chains, climate adaptation and nutrition: Empowering the poor to manage risk'. The 3-year project will have a primary focus in India,Guatemala and Mali and will be implemented from 2015 to 2017.

The workshop took place in Courtyard Marriot, Bhopal. About 55 participants including 5 international participants participated in the workshop.

Inauguralsession:

The workshop was inaugurated by Mr. Ashis Mondal, Director, ASA 11.00 am. The welcome address included mentioning delegates who made to this workshop, special mention was Dr. Stefano Padulosi, Global Coordinator, NUS project, Gennifer Meldrum, Helene Botreau, Jessica Ranerifrom Bioversity International (a CGIAR Institute), Rome, Italy,& Manetto Sara, Indigenous Partnership for Agro biodiversity and food sovereignty, Bioversity International from Rome, Italy. Dr. Saikat Datta Mazumdar, (ICRISAT-Hyderabad), Dr. B.Dawakar Rao, Indian Institute of Millet Research(IIMR), Hyderabad, Dr.(Mrs.) Suman Sahai, Gene Campaign, New Delhi, Dr. Elizabeth Thomas, Manager (Projects) Bio-Diversity Board, GoMP, Dr. O.P.Dubey, Regional Agriculture Research Station (Minor Millet), part of the State Agriculture University JNKVV, Jabalpur, Mr. Jitendra Agrawal, IFS, Additional Priincipal Chief Conservator of Forest, GoMP, Dr. Vivek Sharma, Director, CARD, Mr. O.P. Agrawal, Vice President, NSPOT& Farmers from project area of Mandla and Dindori, and other delegates from NGOs and press.

This was followed by ASA's brief introduction, the beginning yearof 1996 from Jhabua district in M.P. The thrustareas wereon watershed activitiesin central tribal belt of India. Now the work has spread to three more states of Bihar, Chhattisgarh and Jharkhand having an outreach of 1350 villages with 1,50,000 smallholder families. The focus is on agriculture based livelihoods, which in most cases starts with land and water resources development, sustainable agriculture initiatives and agribusiness promotion through promotion of Farmers Producers Company (FPCs). Whatever ASA does is through community organizations, which mainly consists of women groups or Self Help Groups (SHGs), or producers Groups (PGs), users groups (UGs) etc.

The NUS project:

ASA in collaboration with MSSRF, Chennai implemented NUS project in Mandla and Dindori districts between year 12-13 & 14-15 in two districts in three blocks in, where it has identified two crops; *Kodo (Paspalum ScrobiculatumL) and Kutki (Little Millet- Panicum SumentranseRoth)* for interventions which were getting marginalized rapidly. The project demonstrated the potential of these crops, introducing new varieties, package of practices, value addition in the form of seed production and few food products and marketing them. Both the

crops now is grown in more area, and now being taken up for expansion in ASA project villages in Mandla& Dindori Districts. Key highlights are;

a. Project area part of India's Central belt dominated by tribals (Baiga & Gond)
b. Nutrition of majority population here under stress, and can be solved through agro-biodiversity
c. Need for market led production system
d. Government role is a necessity, through changes in policy decisions
e. Consumer education and awareness on agro-biodiversity
f. Significant decrease in area under NUS crops inspite of productivity gains
g. Role of research and development for new varieties, package of practices, processing technologies, nutrition recipes, etc.

The two days workshop schedule was shared with the participants. The first session would be on the project outline, to be shared by Mr. Stefano Padulosi. The first day would have presentations from resource persons from JNKVV, ICRISAT, MP Biodiversity Board, IFAD supported Tejaswani Project,Ministry of Women and Child Department, Govt of MP.,Project area briefings, trends of millet crops in MP and India, Marketing opportunity for agri-commodity through on line trading platforms by NSPOT, Experience of MSSRF in NUS crops.

The workshop schedule is attached as annexure with this document at the end.

Presentation of Mr. Stefano Padulosi, CGIAR, Rome, Italy:

The NUS is a 3 years project sponsored by IFAD-EU-CCAFS project, titled "*Linking agrobiodiversity value chains, climate adaptation and nutrition: Empowering the poor to manage risk'* would be piloted in three countries, Guatemala, Mali and India,

The NUS project essentially is Diversification strategies to address multiple goals; food and nutrition security, income generation, climate change adoption which essentially has arisen because of increasing gap between researchers and farmers network, to analyze diversification options for development of equitable value chain to address project goals.

The project objectives are:(a) Strengthen capacity building of local farmers (wo/men) and field partners to promote, conserve and document stress tolerant traditional varieties following scientific assessment and documentation. (b) Strengthen CBOs to document best practices in sustainable conservation and use of agro biodiversity. (c) Strengthen capacities of NARS to integrate climate risks in holistic value chain approach and promote successful approaches through collaborative linkages with project communities with national and international agendas. And finally (d) enhance scientific understanding of agro biodiversity in resilient and nutritional sensitive production and food system and advocating policy changes.

Approach: The project would address (a) livelihood system perspective combining resilience dimensions- productionsystem, nutrition and markets, (b) focus on NUS as model crops as they are stress resistant, has immense nutritional value hence develop value chain, (c) focus on women and indigenous people and (d) household and community resilience.

Why NUS: **Adaptation**:NUS are highly resistant to a-biotic stresses, but not sufficiently exploited, economic competiveness resulting in mainstream agriculture marginalization and potential strategic future assets. **Conservation:** NUS largest portfolio of crops conserved NOT in *ex situ* gene banks but *in situ*/on farm – hence the focus of the project; importance of approach in support of "Evolutionary Agriculture' favoring continuous adaptation; **Nutrition:** Scientific evidence for nutrition from diverse crops (cereals, vegetables, pulses and fruits- a diverse set of nutritious-dense species whose role is increasingly appreciated also by science;**Market: to tap** nutrition/ health conscious consumers across the board; **Culture:** reservoir-gastronomic diversity, identity and geography. **Empowerment: E**mpowerment tool for women and vulnerable groups and intellectual property rights.

Justification for NUS was also need of the hour as by 2071, increase temperature would reduce the production of existing cereals, rice and wheat significantly and NUS has been found to have better adoptability and thus a very good food and nutritional security of the country. In this context, case of Canihua was highlighted.

Key actions: capacity building of project beneficiaries at multiple levels, focusing more on women, enhance preparedness of farmers and value chain actors in the context of climate variability and risks, strengthen network to facilitate communities to manage traditional crops through documentation, monitoring and exchange of information, and mobilize and influence national and international forums to voice concerns and aspirations of local communities to benefit the poor marginalized communities for sustainable food production systems.

Innovative components of NUS project: need for minimum indicators to capture multiple dimensions (climate adoptability, resilient crops, food and nutritional security, value chain development), setting up of weather stations for recording weather information, gathering market information to help decisions at the level of farmers in production and marketing, participatory documentation for identifying red list crops requiring special focus for bringing back into farming, develop linkage between farmers community and scientific establishment and finally promote ex situ and in situ gene banks.

Special focus was laid for proactive engagement with women, indigenous people, and moving towards in situ and ex situ synergic approaches that can play significant role in networking, participatory documentation, seed exchange, together these can strengthen adaption and climate risk management.

The presentation concluded with remark; **Biodiversity is also celebration**.

Presentation by Dr. Elizabeth Thomas, Madhya Pradesh State Biodiversity Board (MPSBB)

MPSBBas per mandate of Biological Diversity Act 2002, there is significant stress to conserve Biological diversity, ensure sustainable use, and fair and equitable sharing of benefits in terms of knowledge sharing, biological resources.The MP State biodiversity boards works through statutory bodies called Biodiversity Management Committees constituted at District, Block, Gram Panchayat and Gram Sabha.

The MPSBDB promote in-situ conservation of traditional crops, rice varieties- chinnor, Kalimoonch, vishnubhog and minor millets like kodo, kutki, saanwa etc. **Traditional varieties are preferred because of less susceptible to disease, pestand drought resistance being suitable in low rain-fed areas.**

Dr. Elizabeth, highlighted the promotional activities now in operation in MPSBDB, grant assistance to popularize the traditional rice varieties in Satna, popularizing System of Rice Intensification (SRI), andsetting up seed bank for 65 varieties. The MPSBDB is now also engaged in organic certification for crops being promoted, setting up Gene Bank in Pithorabad,Satna District, MP where 100 land races of rice preserved. Ex Situ conservation- Kathiya wheat traditionally grown in Malwa region was taken to Sagar, which have been found suitable for Dalia (Porridge).

Other activities are as follows;

-Collection, conservation and multiplication- Native minor millets, Local land races of Paddy

-Local land races of Maize, local varieties of Mango through collaboration with Agriculture Colleges, Community based Seed Banks of traditional varieties.

DR. Elizabeth's presentation ended with short documentary film title " Ek Anoothi Pahal".

Technical Session-1:

Presentation by Dr O. P. Dubey Pricipal Scientist, RARS, Jawaharlal Nehru Krishi Viswavidyala (JNKVV): Climate change in Madhya Pradesh: Observed changes, impacts on agriculture and outlook

The presentation started with experienced changes like rising temperature , reduced rainfall and irrigation potential, extreme climatic events, rising sea level, increased pest and diseases. Different strategies adopted are draught and pest resistant varieties, INM, Short duration, use of organic matter, optimum storage, rain water management, inter cropping etc.

The above characteristics mentioned very well matches with certain crops, now being grown in Mandla are, Proso Millet (*Panicum miliaceum* L), Kodo Millet (*Paspalum scrobiculatum*), , Small millet (*Panicum sumentranse* Roth), finger(*Eleusine coracana* L), foxtail millet (*Setaria italica* L. Beanuv), and Barnya millets (*Echinochloa frumentacea*). These crops have plenty of nutritional value, constituent wise analysis shows high protein and carbohydrate content, rich in phosphorus, calcium,iron etc. The crop wise details of each component were presented.

Madhya Pradesh occupies important place in each of these crops, but over the years there is significant drop in cultivated area in 2009-10 area under millets is 24% of India (from earlier 42% in 1986-87). The total production and productivity for MP is also lower than India, 16% of total production at 1.25 lakh ton, and 408 kgs/ha against India average 697 Kgs/Ha.

But these crops now are grown in very less quantity and there are various reasons like, millets are considered to be poor person's food, grown in less productive land and hence productivity is negligible, unavailability of high yielding varieties, given very less priority by farmers, traditional practices followed for cultivation, less priority and absence of any promotional initiatives by government.

Dr. Dubey shared that he has developed some varieties having very good performance, and they are as follows;

Kodo: JK-439 Productivity 90-95 days : 20-25 qtls/ha, DPS9-1 (90-95 days)- 2-28 qtls/Ha: 65 days variety is also available.
Kutki: JK-8 (70-75 days) 8-10 qtls/ha, DLM-203 (115-120 days) 15-18 qtls./ha

(Similarly there are 6 other varieties having similar yields).

Other initiative has been in designing of low cost agri implements, for sowing and intercultural activities. He also mentioned that MP Govt. has several tribal focused programmes.

Presentation by Dr Saikat Datta Mazumdar, Chief Operating Officer, ICRISAT, Hyderabad: Role of Neglected and Underutilised Species (NUS) in nutrition and food security in India (and thoughts for M.P.)

Dr. Sauikat's presentation dealt with NUS in nutrition and food security in India. The presentation started with higher proportion of undernourished and severe acute malnutrition population 60 million (86 million world) and 9 million (world 11 million).

> ***7 million children*** *under 3 years of age in India are* ***SAM*** *(weight for height < 3SD,* ***One-third*** *of currently* ***married women*** *in the age-group 15 – 49 years have* ***low BMI*** *(< 18.5 kg/m^2),* ***47% girls*** *of 15 – 19 years have* ***low BMI, 51.2% women and 49.4% of children*** *aged 6 - 35 months in India are* ***Anemic, 19% of children*** *aged 12–35 months had received 3–5* ***doses of Vitamin A***
>
> ***Coming specific to Madhya Pradesh, 60% children below 5 years, are reported underweight. (2005),***

The reasons cited are many, (a) Nutritional Status of Women during adolescence, pre-conception and during pregnancy, (b) Poor infant and young child feeding (IYCF) practices, (c) Poor intake of essential calories, proteins, fats, and micronutrients and (d) Unsafe drinking water, lack of sanitation and unhygienic environment**.**

To address the food and nutritional problem several programme have been launched by Government of India

Schemes by Food and Civil Supplies Departments other than food subsidy

Programs under Department of Agriculture

National Food Security Mission (NFSM)

Rashtriya Krishi Vikas Yojana (RKVY)

Price Stabilization fund for Cereals and Vegetables

NHM /Mission for Integrated Development of Horticulture

Schemes under Department of Water Resources

National Rural Drinking Water Program

Nirmal Bharat Abhiyan (renamed as Swachh Bharat Abhiyan)

Schemes under Department of Rural Development

National Rural Livelihood Mission (NRLM)

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)

In this backdrop, Dr Saikat shared various initiatives of ICRISAT, and special mention was on;

Amplifying nutritional impacts from agriculture in India through a multi-stakeholder partnership, leverage provision of a knowledge base, technical assistance and services using participatory, demand driven engagements with and for:

Policy makers and other decision makers on integrating agriculture, nutrition, rural development and allied sectors.

Farmer cooperatives/associations/ entrepreneurs including formal and informal groups (of both women and men).

Private companies, government agencies and informal groups involved in seeds supply and sale (e.g., legumes, biofortified cereals).

State Government agencies of agriculture, horticulture, rural development, food processing etc. to include a nutrition perspective in the agricultural programs; State Government agencies of health and women and child development, mainly NRHM and ICDS projects for pilot testing, up-scaling and out-scaling, as well as lessons learnt.

Capacity building of CBOs, Anganwadi Workers, ASHA, ANMs, Lady Supervisors, and Link Workers through local NGOs and ICDS, and women in child bearing ages.

Education and raising nutrition awareness

Nutriplus Knowledge that tries to understand nutritional potential of crops, opportunity for value addition, provides training and technology support, and conducting entrepreneur development workshops.

Presentation by Mr. Shaji Jones, Project Manager, ASA: Proposed Project Location

The NUS project is proposed in two contiguous districts of Mandla and Dindori spread over 15783 sq kms in 2118 villages, entirely rural 90% in Mandla and 95% in Dindori. The area has huge tribal concentration including some primitive traibals and has lot of similarities in cultural and agriculture. Primary occupation is agriculture, dominated by small and marginal farmers and agricultural labors.

The area is supposed to have rich biodiversity and indigenous knowledge. As per imperial Gazeteer of India – 1908, *Kudo and kutki*with average productivity of 476 kgs/ha was the main cereals (49 % sown area) followed by wheat and paddy. This scenario has entirely changed now, paddy and maize is the kharif major crops, wheat in Rabi. As per 2010 stats the area still has large number of indigenous paddy varieties having lot of beneficial characteristic like early maturity, logging tolerant, pest and draught resistance.

Beside indigenous paddy varieties, the area has large number of minor millets, (18 types)

Paddy is the most important crop in all the locations, apart from paddy, the traditional crops of these regions include wheat, maize, masoor (lentil), millets, niger. Almost all farmers used to grow and maintain the traditional varieties of these crops, and some of them still grow them for their self consumption. Millets like Bajra & Jowar have almost disappeared from the area, while millets like Kangani and Sawaan are grown sparingly in the regions. Till early 1900, Cotton was also known to be grown in the region. Before 1978, there were 6 landraces of ragi of which only 2 are left. In Kodo, there were 4 landraces of which none are left. The presently cultivated Kodo varieties are the university developed varieties. In Kutki there are 6 land races, which have been preserved by tribals.Another scented variety Jawaphul is believed to be extinct

Presentation by Dr. B Dayakar Rao, Principal Scientist, Indian Institute of Millet Research-IIMR-Hyderabad (India): Market Opportunities for NUS crops: Status and outlook.

Dr. Dayakar's presentation stressed presence of large number of millets in Indian states with annual production roughly 18 million metric ton from an area of 17 million hectare, 54% contributed by Bajra followed by sorghum (33%), ragi (10%) and small millets (2%). The primary reason for small share of small millets is lower productivity, 565 kgs/ha, against 1581 kgs/ha of ragi, 1149 kgs/ha for Bajra (pearl Millet) and 920 kgs/ha for Sorghum.

Millets, for centuries is staple food in semi arid tropics, characterized by low rainfall, high resilient to different ecological conditions hence potential crop for food and nutritional security because of very high content of protein, minerals, fiber, phosphorus, iron, carotene, thiamine, riboflavin, folic acid. The details data of all the above contents were presented.

Inspite of several beneficial characteristics, there is huge gap in production, and utilization, because of inconvenience, lack of processing technology, safety and quality assurances, low market surplus, and neglected policy and changing consumer tastes and preferences due to urbanization and income level.

Millets value chain delineating different interventions drawn up to address different gaps that exists with functions like storage, mechanization needs, certification issue, pricing, with engagement of different stakeholders linking farmers to consumers with appropriate collaboration with aggregators, processors, R&D institutes, private players in food business, policy makers..

The case of Market driven Sorghum production was shared in details. 1500 beneficiary farmers were technologically backstopped with DSR developed 10 product specific sorghum cultivars in 2 seasons in 3000 acres for four years

Beneficiary farmers were provided Buy-back assurance by ITC (ABD) under market assured *e-choupal* model in PPP mode

On-farm technological backstopping resulted income increase by five times in kharif & doubled rabi season respectively (4 years average over baseline)

Beneficiary farmers linked up with other actors in the value chain

ITC - ABD has provided procurement, bulking, assembling and linking farmers with other actors of value chain- backward integration model

Farm level value addition – flaking at farm gate -10 times value addition -other farmers are motivated & neighboring villages/farmers followed the suit

Achieved in bringing change in mindset of sorghum farmers by giving commercial colour to sorghum cultivation

Similar interventions were shared for following objectives;

1. **Development of sorghum/millets food products and upscalling-** which dealt with diversification of processing technologies, development of products technologies, shelf life enhancement, development of processing machineries, product development etc**.**
2. **Nutritional evaluation and safety of selected millet foods- organoleptic evaluation and recipes, anthropometric and biochemical indices etc.**
3. **Assessing consumer acceptability, price and market strategies and policy imperatives- Consumer acceptability studies, product pricing and centre of excellence.**

Besides entrepreneurship development is the key components of IIM, which conducts range of training programmes for farmers, SHGs and entrepreneurs are done for commercialization.

Initiative for Nutritional Security through Intensive Millets Promotion (INSIMP), part of National Food Security Mission (NFSM) during 12th Five Year Plan (2012-17) with new targets of additional production of food grains of **25 million tons** of food grains comprising of **3 million tons of coarse cereals** by the end of 12th Five Year Plan.

NFSM-coarse cereals are separately dealt with target district in different states. And 16 districts are covered in Madhya Pradesh. And there is special focus on demonstration of individual crops, seed distribution, plant protection and micro nutrients and soil ameliorants.

Other initiatives of NFSM are on farmers' producer's organizations, which SFAC has taken special initiative from XIth.

Dr Dayakar concluded presentation stressing future initiatives to make millets as health and convenient food.

Presentation by Mr. O P Agarwal, NCDEX Spot: Facilitating Farmers Producer Company for establishing e-aucton trading platform.

NCDEX through e-platforms trades in commodity, in 2014-15 it had transaction of 70 lakh MT, with an outreachof 10000 farmers. It has special products like e-Auction, WHR Pledge Finance, Online trading platforms and e-Mandi. It has direct linkage with Mid day meals scheme, Public Distribution Scheme, Milk Federations. It deals in Rice, Sugar, Jowar, Ragi and maize.

NCDEX has come up special package keeping in mind the FPCs needs, where FPC and NCDEX work in collaborative mode, based on their skill and expertise. Various products are **Aggregation Model for FPCs, warehouse e-Auction and Warehouse WHR funded e-auction.**

Warehouse e-auction, the FPC take the responsibility of aggregation and stocking in warehouse, the NCDEX arrange for e-auction, take confirmation fro highest bid from FPC, collect advance from approved bidder and transaction.

Om Agarwal conclude the presentation with the hope of initiating the specially developed packages for serving the FPCs and farmers especially in minor millets.

Presentation by Kashi Nath Metya and Ashsis Mondal, ASA- Current status and existing value Chain Initiatives on NUS.

Millets, god's own crops and projected to be future of food and farming in India presently constitute 9% of total food grain. Total production now stands at 18 million metric ton, which has gained 32% in 50 years. Pearl millets having the largest share 56% amongst all the millets.

In last 50 years, the productivity in general for all millets has increased substantially, 288% the highest in the case of Bajra but the lowest gain recorded in the case of small millets (46%). Inspite of huge gain in productivity the area has declined almost by 50%, now 18.6 Million Ha. State wise analysis reveals Madhya Pradesh contributing only 3% of total production of millets, with moderate productivity level of 1400 kgs/ha. The major reason for lowest share was very low irrigation merely 0.2% against highest for state of Andhra Pradesh at 26.3% and all India average of 9.4%.

Overall the per capita consumption has significantly declined both in rural and urban area, 3.1 kgs per person per annum in rural areas (1.1 for Urban). The industrial use has shot up from 1993, now it is approximately 40%.

Price is another important indicator, which needed intervention with the Minimum Support Price (MSP), and over the years it is observed that the MSP is above the market price.

Several initiatives taken up in the last including inclusion in Public distribution schems, several multigrain products available, All India coordinated Millets improvements project and setting up of Millets network of India.

Suggestive list for millets popularization are

Increased use of small millets in various ready-to-eat food products should be encouraged as it enhances their value and market price.

Provide millets highest priority in the National Food Security Bill:

Put millets into public food systems of India: Millets need to be integrated into the existing Public Distribution System (PDS) .

Introduce millet meals twice a week in the ICDS, school mid day meals, welfare hostels and such other schemes of the government.

Recognize millets as Climate Change Compliant Crops and promote their cultivation and consumption:

Investment on millet lands which apart from creating permanent investment for the poor can also create at half the cost of NREGA, double the employment days.

The improved seed either should be supplied free or subsidized by the Government.

Integral part of daily food- Roti/Rice- Millets-Pulses-Vegetables

Presentation by Ramveerrajput and Sharad Mishra- Community perspective on need and opportunities for NUS

ASA for last three years has been working on NUS crops in Mandla and Dindori, which is dominated by tribals.Agriculture is the primary livelihoods source, lot of NTFPs and seasonal migration is very common.
Importance of NUS is primarily because it is presently used as food, cereals, oil seeds, and has advantage as it can sustain in low rainfall areas, and less susceptible to climatic changes now experienced more pronouncedly. Husk of millets used as fodder and overall perceived to be beneficial characteristics especially for diabetic patients.

Opportunities in terms of land types, hilly and undulating topography, facilitates easy drainage, stones suitable for millets, water another important determinants work to its advantage.

Keeping in mind the land and water constraints, interventions could be around the following points;

1. Improving land resources through suitable measures for soil and water conservation, 2. Irrigation facilities could be created especially the ponds that are low cost, small lift irrigation schemes those have been found very suitable in the project area. 3. Through FLDs and PVSP the demonstration of different types of crops and varieties giving the farmers' to choose that suits their requirements. 4. Trainings and capacity building including exposure programme and converging with national programme like NRLM and MGNREGA.

Based on the past experience the team shared tentative plan for 2015-16 under NUS

- PVSP - JK 439, JK 48, JK 41, JK 155, Indira kondo 1, DPS 9-1
- FLDs varieties taken - Finger millet - GPU 28, Foxtail – SIA 3085, Kutki – JK 36

All these varieties would be sourced from JNKVVand IGKVV.

Presentation by Mr. Chaturvedi, Madhya Pradesh Mahila Vitta Evam Vikas Nigam- Tejaswini Rural Women Empowerment Programme- Madhya Pradesh.

Tejaswini is an IFAD funded, women empowerment project initiated in 2007, by MP Mahila Vitta Evam Vikas Nigam. The project has an outreach of 12759 women Self Help Groups (SHGs) and 60 SHG Federations in six districts of Balaghat, Panna, Mandla, Tikamgarh, Chhatarpur and Dindori.

The project goal is "to enable poor women to make use of economic, social and political opportunities" through creations of strong and sustainable SHGs and Federations, new and improved livelihood opportunities and access to functional education, laboursaving infrastructure and participation in local governance.

The cultivation of NUS crops (*Kodo - Kutki*), setting up of processing unit and establishment of Producers Company are some of the lead activities under the Tejaswini project. NUS initiative was started in 2013, with 1497 women farmers. Each women farmer cultivated in 0.5 acres of land, on an average each women harvested 1.5 quintals, of which they contributed 20 kgs to the Federation. 300 quintals of *Kodo Kutiki* was produced. The programme expanded to 41 villages, 7500 women farmers, 1500 quintals and net profit of Rs. 25 Lakh in 2014.

Tejaswini project has drawn up an exhaustive plan for NUS crops, the key intervention points are-capacity building of women farmers on package of practices, ware housing, processing, product development, market identification, etc

Plenary Discussion on Target crops, area, stakeholders partners etc:

a. **Presentation by E. D. Israel Oliver King, MSSRF Chennai, India-** Existing conservation and promotional efforts on NUS-Experience from the field.

Mr. Oliver King started his presentation with opening statement "Millets as climate smart crops, showing adaptability of different millets grown and piloted by MSSRF in India. But at the same time highlighted several key issues, lack of suitable improved varieties and improved cultivation practices, Poor extension system for crop promotion and yield enhancement, lack of specific post-harvest and processing technologies for small users productive assets, low economic competiveness and lack of more attractive, and modern food recipes, Poorly organized value chains, Insufficient awareness of nutritional value and income opportunities, adequate Policy support to promote traditional millet crops.

And to reverse this, need to have conservation and sustainable use following 7C approach, that integrates science based participatory research, building grassroots, enhancing capacity and enhancing resilience- and seven Cs are- **Conservation**- community seed bank and networks, **Chronicling**- Collection from custodian farmers; **Cultivation**- Productivity enhancement through PVs, QSP and intercropping**,Collectives-** community based infrastructure creations through social capital building, village resource centre for weather information,, **Communication-** awareness campaign specially catering to different age groups, **Commerce-**

Millet product development programme, **Consumption-** Drudgery reduction through simplification in dehusking, processing, recipe for ready to eat food etc.

Critical leads suggested by Oliver are as follows;

Diversity Estimation and Documentation climate resilient agriculture practices (Millet and Associated crop diversity)
Community based Seed banks and Information systems
On Farm mechanization and Post harvest processing small millets
Community institution for NUS promotion
Branding, labeling and packaging for millet products
Diversity based local production, local market development and private sector partnership
Establishment of local weather stations and Market information systems
Attempt to include in the ICDS, NMS and PDS

b. Presentation by Ms. Suman Sahai, Gene Campaign, New Delhi, India - Underutilized crops, dealing with NUS commodity.

Gene Campaign comes from rich experience of conservation of germ plasma- mainly rice crop from the eastern regions, where more than 1000 varieties have been well documented. Conservation and collection, rice is well documented crop, understood, farmers able to tell broad characteristics about rice. But this is not true for minor millets or the NUS, and this is the main reason for its neglect. Millets even do not have nomenclature, even difficult to organize these crops. This is quite contrary to case of rice, viz. **Kalamdani**(traditional rice variety) is known in all the states where it is grown. Hence documenting millets is a challenge.

Different **traits and/or properties**, agronomic, biochemical, keeping qualities, cookingetc is available for rice. Similar things are required for millets. **Value for any crop**, especially in traditional varieties is in identifying traits. Like resistance to bacterial leaf blight, moisture resistant etc Peculiarities and strengths. It would make it more attractive for Scientificcommunity. Trait evaluation if done would be helpful for policy decisions. **Milletsbroad adaptation rate**, if some varieties lost in say MP, it can be brought from other places where ever it is found, it is most likely that it will grow to its full potential, as it has broad adoptability its unlike other cereals. Rice is less adoptable, and wheat very less adaptability.Millets are most climate resilient and nutritious, Uttarakhand pilot clearly indicated this. But still this failed to attract farmers because millet is a devalued crop.

Bio chemical analysis, variability of all crops, what we have done with rice, biochemical analysis in traditional varieties, example certain rice (traditional)varieties matching protein content with wheat.Similarly strategy would be helpful in millets that would help to position millets. Nutri-farms, millets in PDS are only leap services, these are millets, which variety, which to be promoted. Without these works, policy work would not go far.

Pure lines for millets. Yield is not all, farmers look for different qualities. Who are we doing it for, women in the case of millets, trails with millets is for fodder, biomass. Farmers select it's because for sweetness, taste of the biomass.

Seed bank is important for seed multiplication. Farmers do it for grains but do not do for millets,

Lot range of veggies, which are not cultivated, dietary diversity. It's not the grains only, its cereal, veggies, fruits all these make. Millets still have lot of nutritious because we have not fiddled with these varieties. This is quite contrary to the case of vegetables, where there is report of significant loss in nutritional value 10-40%. Wild varieties are nutrioustious bombs.

Just not grains are sufficient, there is wide range of fruits, flowers, and leaves all have huge nutritional and food value. But because of devaluation done to these, it's mainly used for home consumption and oftenis hidden from the outsiders.

Great potential, open the basket, region wise effort what works best in a place….mere replication not enough.

c. Presentation by Mr. J Agrawal, APPCF Government of Madhya Pradesh

Resilient agriculture for food and nutrition and climate change. Project area is tribal dominated, high illiteracy in such a society there is tendency to discard things that works well in the area. Knowing it would be good. These people were hunters and gatherers not so much cultivators. They collect from forest that is tastes. Wild fruit or cultivable fruits part of traditional food basket. Aspects of nutrition and more money, if *Kodo Kutki*, wouldfetch Rs.50. The people would prefer to sell it outsiders for earning little more money and buy what they attach more value or need of the family. So the quality of nutrition would go away from the tribals.

Cost of production is a component, rained condition, adding irrigation would add to the cost which we should be careful while addressing irrigation, often seen as constraints in agriculture.

Rishi Kheti (Traditional) without use of implements, mother earth not to be disturbed no tillage-Hosangabad case was highlighted, who do not till and get good yield with lot of diversity. Rishab Kheti, use of Ox in cultivation and Engine Kheti where powered implements are used.

Simple package of practices, seed and grain, 4% seeds that they were using, gave double the yield. Multiple cropping, resilience to climate change – Concept is to keep the soil covered, so that moisture is retained and not evaporated, lot of innovative practices can be propagated.

Tribal areas, lot range of projects, listening to different, lots of dos and don'ts, try to understandtheir concerns and analyze what is there in the ground, the decisions should never be imposed.

Never ever supply an answer but questions…that leads to the solution from the people and therefore more acceptable and adoptable. Our solution would make them dependent.

Concluding remarks by Ashis Mondal:

Thanked all the speakers for bringing many new things related to NUS. But pinpointed issues are production-market-there is better awreness, growing middle class, health conscious middle class, the rural population it can be part of their meal that used to some decades ago.

The lot of work has already been done, with this the project has very good starting point taking learning from all the stakeholders experiences.

20th June 2015, Second day

The second day of the workshop was in recapitulating the first days proceedings and leads for the NUS project in India, which was integrated in preparation of project action plan.Action plan captures details activities, time line, and potential linkages with stakeholders. And copy of the action plan is attached with this document.

The workshop was concluded by Mr. Ashis Mondal, with following remarks, the two days workshop gave an opportunity to know the NUS project in details, and various interventions initiated by different agencies. We have an added advantage to start from beginning that has already been made by different agencies both government and private agencies. There were indications and commitments from some agencies and this project would make every effort to get their inputs and support.

Ashis thanked all participants and looked forward to ongoing engagement throughout the project period.