



# DESI RICE

16-23 June, 2021

11 AM - 1 PM



# DESI RICE WEBINAR

## Conservation, Cultivation and Consumption

### National Webinar on Desi Rice

#### Conservation, Cultivation and Consumption

##### PROGRAMME SCHEDULE

| DATE               | Topic I   | RESOURCE PERSON   |
|--------------------|---|---|
| <b>16.06. 2021</b> | <b>DAY 1 Wednesday</b>  |   |
|                    | Welcome   | Shri. Prasant Mohanty, Executive Director, Nirman, Odisha                               |
|                    | Save Our Rice Campaign  | Smt. Usha S, National Convener, Save Our Rice   |
|                    | Rainfed rice farming systems  | Dr. K S Varaprasad, Former Director ICAR-IIOR Chairman, WGoSS, RRA Network              |
|                    | Expectations from the Workshop  | Smt. Anitha Reddy, Trustee, Sahaja Samrudha   |
| <b>17.06.2021</b>  | <b>DAY 2 Thursday</b>   |   |
|                    | Desi Rice Treasures   | Shri. Soumik Banerjee<br>Co-Convenor, Bharat Beej Swaraj Manch                          |
|                    | Rice of Western Ghats   | Shri. Panduranga Hegade, Karnataka<br>Gramin Yuva Pragatik Mandal, Maharashtra          |
|                    | Rainfed Rice Conservation Initiatives   | Sangatha, Chhattisgarh<br>Forum for Indigenous Agricultural Movement (FIAM),            |
| <b>18.06.2021</b>  | <b>DAY 3 Friday</b>   |   |
|                    | Establishing Rice Diversity Block and Characterization                                  | Shri. Sanjay Patil, BAIF, Maharashtra   |
|                    | Establishing Desi Rice Seed Bank  | Shri. Sudam Sahu, Seed Saver, Odisha  |
|                    | Visit to Rice Museum  | Shri. Boregowda, Karnataka  |
|                    | Conserving 1000 rice varieties  | Shri. Syed Ghani Khan   |
|                    | On-farm Conservation  | Shri. Anand Theertah Pyati  |
|                    | Rice Conservation in the Back yard  | Shri. Sathyanarayana, Kasargod, Kerala  |
| <b>19.06.2021</b>  | <b>DAY 4 Saturday</b>   |   |
|                    | System of Rice Intensification (SRI)  | Shri. Jacob Nellithanam, Convenor, BBSM   |
|                    | Clonal propagation of Rice  | Shri. Soumik Banerjee, Co-Convenor, BBSM  |
|                    | Conservation of traditional rices and improving its productivity through Perumal method | Shri. Sreeram, Save Our Rice Campaign, Tamil Nadu                                       |
|                    | Direct Seeding of Rice (DSR)  | Dr. Gollar, Retd. JDA, Govt. Of Karnataka   |
|                    | Rice Seed Treatment   | Shri. Krishna Prasad, Sahaja Samrudha   |
| <b>20.06.2021</b>  | <b>Day 5 Sunday</b>   |   |
|                    | Rice value addition   | Smt. Seema, Save Our Rice Campaign, Karnataka   |
|                    | Red Rice: Unknown treasure  | Dr. Sathyanarayana Bhat, Principal, Ayurvedacollege                                     |
|                    | Cooking with traditional rice   | Smt. Krupa, Blogger, Bangalore<br>Smt. Sreedvel Laxmi Kutti, Bio Basics, Coimbatore, TN |
| <b>21.06.2021</b>  | <b>Day 6 Monday</b>   |   |
|                    | Traditional rice processing challenges  | Shri. Gauthaman L.K Varaprasadam Organic Mart TN  |
|                    | Organic rice processing experience  | Shri. Rajesh Krishnan, TAPCo Waynad, Kerala   |
|                    | Namma Nallu, Effort to Save Traditional Rice Vars                                       | Dr. Balusubramanian, CIKS, TN   |
| <b>22.06.2021</b>  | <b>Day 7 Tuesday</b>  |   |
|                    | Brown rice vs. white rice:  | Shri. K.C. Raghu, Safe food advocate, Bangalore   |
|                    | Nutritional analysis of Traditional Rice Varieties                                      | Dr. Satya, Dept of Biotechnology, Sastra University, TN                                 |
|                    | Rice fair and Festivals: Mainstreaming desi rice  | Sri. Krishna Prasad, Sahaja Samrudha  |
|                    | Farmers Markets: linking rice farmers and consumers                                     | Shri. Anand Teertha Pyati, Save Our Rice Campaign                                       |

|            |  |   |
|------------|--|---|
|            | Marketing of organic rice                          | Shri.Somesh B, Sahaja Organics, Bangalore   |
| 23.06.2021 | Day 8 Wednesday                                    |   |
|            | Guidelines for quality rice seed production        | Dr.Anupam Paul, West Bengal                 |
|            | Production and Marketing of Traditional Rice Seeds | Shri.Manju KSSahaja Seeds, Mysuru           |
|            | Developing action plan                             | Shri.Uday Nagubandi Smt. Geeta Mahalingapur |
|            |  |   |

## INTRODUCTION

More than a staple food crop, rice is life to people throughout Asian. Rice is the cornerstone of our food system, culture, rituals and traditions. Rice, which is rich in genetic diversity with thousands of varieties that fit the ecological niches all over the country, from the temperate high hills of the Himalayas to tropical lowland deep water, and salt-water marshes of the seacoasts. Farmers of many succeeding generations have been able to innovate, develop, and adopt practices and technologies on rice.

Rice grown in the rainfed is under almost natural conditions and major food production systems in India. The region has been making a significant contribution to the rice supply of the country with major challenge. Though large number of rice varieties are still grown in various parts of the country by tribals and small farmers who are deprived of modern technologies and health care systems, where indigenous paddy with their nutritional and medicinal properties are a rich alternative for the same.

## WEBINAR

Desi Rice Webinar - Conservation, Cultivation and Consumption was organised by Working Group on Seed System RRA Network and Sahaja Samrudha in collaboration with RRA Network, Save Our Rice and Nirman.

RRA Network – a network of civil society organisation, researchers, practitioners and policy makers with the vision to establish productive and resilient rainfed agriculture.

Sahaja Samrudha has built a movement that today includes 5000 rice-conservers and farmer-breeders across the country, conserving more than 1000 varieties of Scented, Medicinal, Deepwater, Saline-tolerant, and Dry land rices.

**The Save Our Rice Campaign** built a movement towards achieving food security and sovereignty, reviving our rice culture and sustaining rice eco-systems. While creating alternative models for sustainable ecological rice cultivation has developed a platform for people with rice culture as a common concern.

NIRMAN, an initiative for sustainable development has been **Promoting equitable, just, resilient and sustainable environment** in rural development and advocating rights-based concerns in areas of forestry and sustainable agriculture.

The webinar had presentations and demonstrations focusing on sustainable rice production techniques, crop management, developing rice supply chain, benefitting farmers and rice producers. The webinar was aimed to address and develop ecologically sustainable and economically viable rice and rice-related systems production technologies through research and technology verification in farmers' fields to increase the income and improve the socio-economic conditions and quality of life of rice farm families in the rainfed ecosystems. The sessions were planned to enhance the productivity of rice and rice-based with presentations from Scientists, Researchers and Farmers involved in Genetic improvement in rice variety for higher yield and stability, on-farm participatory research, better crop management and crop techniques,

effective post-harvest technology, nutritional analysis and crop climate adaptations and to strengthen the capacity building of the stakeholders.

The webinar was well attended by Seed Savers, Rice Farmers, Scientists, Students, Young Farmers, Processors, Farmer producer groups, Students, Entrepreneurs/Startups, farmer entrepreneurs, Professionals, NGOs from different states.

Desi Rice webinar, a series of eight online programmes from the 16th to 23rd June 2021 and each session was followed by 15 minutes of discussion with the participants on the topic.

## **DAY 1 -**

YouTube link for Webinar 1- <https://www.youtube.com/watch?v=Mowovi98fM>

### **WELCOME ADDRESS**

- **Prashant Mohanty, Director NIRMAN**

Prasant is a founding member of NIRMAN, an organization working in Odisha, welcomed all the participants to the webinar, and said that the organization working for more than 25 years in rural development and advocating rights-based concerns in areas of conservation of biodiversity. India was home to more than 100,000 rice varieties, Rice is the most important crop in our country, is our heritage and our identity. Unfortunately, the last few decades have threatened the diversity and made rice cultivation unsustainable.

The webinar has brought in all the eminent personalities who had taken time to grace the occasion and make the event a big success. He extended a warm welcome to all the farmers and representatives from different organizations, experts, speakers who would be addressing the several sessions and sharing their valuable knowledge and experiences. He talked about the significance of the webinar and about the theme and briefed about the rainfed rice farming and the conservation and revival of indigenous rice varieties in the country by grassroot organizations and NIRMANs experience on these initiatives.

### **SESSION -1**

### **SAVE OUR RICE CAMPAIGN**

- **Usha Soolpani, Director of Thanal and National Convener of Save Our Rice Campaign.**

Usha shared her journey in conserving the rice diversity. Save Our Rice Campaign, a movement towards achieving food sovereignty, local livelihoods and economic and ecological sustainability and influencing State Policies for the same. In 2004 we launched the campaign to 'save rice'. In 2006, the campaign was steered in three southern rice growing states - Kerala, Tamilnadu and in Karnataka and then in 2008 spread to West Bengal, Orissa, Chhattisgarh and Jharkhand. The campaign was built on five pillars were agreed upon as - Conserving Rice Ecosystems, - Sustaining Rice Culture and Diversity, -Protecting Traditional Wisdom, - Preventing GMOs and Toxics, -Ensuring Safe and Nutritious Food. The campaign brought all farmers, consumers, organizations, traders, millers, students, children, teachers, leaders, policymakers, media, academicians, scientists and in a broader sense, the general public – to explore the chances of sustaining rice and rice culture.

Revival and multiplication of numerous traditional varieties and some were almost brought back from extinction as part of the Campaign. From its modest beginnings in 2007, today the campaign has more

than one lakh farmers and about 2000 rice varieties, were 35-60 varieties are popular. Organized Seed Festivals, Food Festivals, and Organic Rice Melas to popularize the traditional paddy varieties and rice culture. Several Campaign and advocacy rallies, meetings, workshops develop sensitivity in policy circles towards sustainable paddy land policy.

The highlights and success of the Campaign – the campaign achieved in spread of traditional rice seed in all the seven states, establishing 21 community level seed banks, conservation of 2000 traditional paddy varieties. The revival has been with establishing rice diversity blocks. And more than 1 lakh farmers are cultivating indigenous paddy varieties seeds and rice, they have also won many awards and have been featured in the media. They have also been recognized by the government as expert organic farmer trainers.

The Save our Rice Campaign has been part of the varied efforts to protect wetlands, conserve water, and has also developed sensitivity in policy circles towards sustainable paddy land policy and demanded state level policies for organic farming, prevent genetically modified organisms in agriculture and promote organic farming with traditional seeds for the last 12 years.

Achievements of the Campaign –

- No. of states Campaign active on field -7 states
- Total no. of Community level Seed banks established – 21,
- Total no. of Trade networks established – 21 networks,
- Total no. of Rice Diversity blocks (RDBs) maintained -26,
- Total no. of Rice Resource Centres established – 11,
- Total no. of Indigenous varieties of paddy seeds conserved- 2000,
- Total no. of farmers adopted indigenous seeds & organic farming – more than 1 lakh.

The Campaign has encouraged and supported seed breeders and seed savers. Now we have over 100 seed savers across the Campaign states, with over 25 seed breeder farmers across four states, who are regularly selling seed of indigenous varieties of paddy to fellow farmers and fulfilling the requirements for various government programs. Five farmers have developed their own varieties. They are multiplying these seeds and are selling in the seed market. The farmers have been profiled in print, visual and other media in all the states.

The campaign is all about Empowering Communities for sustainable food security, Climate resilient agriculture through agro-ecology and indigenous seeds adoptions, Seeds Diversity and Conservation through Rice diversity Blocks and seed banks, Adoption of Indigenous Seeds through seed savers networks and seed festivals, Markets for Organic Rice Varieties has been through organic trade networks markets and food melas, Village Level Resources through local rice resource centres and Farmer Level Expertise and Policy Change through adoption at grassroot level and advocacy at higher level.

## **SESSION -2**

### **RAINFED RICE FARMING SYSTEMS**

- **K S Varaprasad Senior Consultant RRA Network & AAPARI**

Rainfed areas contributes to more than 40% of the food grains production in India, with over two-third of livestock population and rice contributing to 44% of the food grain production and Minor millets- 90% followed by Coarse cereals (sorghum, pearl millet, maize)- 87%, Food legumes- 85%, Oilseeds- 72% and Cotton- 65%.

Rice is staple, especially in the eastern states of our country. This crop is grown in highly diverse ecosystems. In some regions it is under almost natural conditions. Because, it was observed that rice was grown with negligible irrigation.

In many states of our country rice is also grown in the rabi (dry-season, roughly January-June with

| Farming System          | State                                   | Farming System                           | State               |
|-------------------------|---|--|---------------------|
| Rice-fish-duck/pig      | Jharkhand, West Bengal and Chhattisgarh | Rice-fish                                | West Bengal/ Assam  |
| Rice + pigeon pea       | Madhya Pradesh                          | Rice+ fish + on-dyke horticulture        | Odisha/ West Bengal |
| Rice-groundnut          | Odisha                                  | Rice+ fish + on-dyke horticulture + rabi | Odisha/ West Bengal |
| Rice+ red gram/sesamum  | Chhattisgarh                            | jute-Rice-wheat                          | West Bengal         |
| Rice+ red gram          | Haryana                                 | Rice-rice                                | Assam/ Odisha       |
| Rice-mustard-vegetables | Haryana/ Rajasthan                      | Rice-field pea                           | Odisha              |
| Rice-black gram-sesamum | Odisha/ Andhra Pradesh                  | Rice-wheat                               | Chhattisgarh        |
| Rice-mustard-sensum     | Odisha                                  | Rice-Lentil                              | Uttar Pradesh       |

evidences of Traditional farming practices of growing crop mixtures which is nothing but a form

of mixed cropping or intercropping. Such practices are critical to food security, equity, and sustainability.

RICE-based cropping system is a common farming practice that comprises of rice as the major crop followed by subsequent cultivation of other crops. Intercropping of rice with compatible crops is practiced and then the rotation of crops involving cereals, pulses, oilseeds, cotton, sugarcane, green manures, vegetables. Various rice-based cropping systems have been reported from different parts of India ranging from rice-rice-rice to rice followed by different cereals, pulses, oilseeds, vegetables and fiber crops.

Rainfed Rice based farming systems and locations (states/ districts)

India has the largest national area of rice cropping and most of it is multi-cropped, and cropping patterns are very diverse.

Genetic diversity of rice is high in India with over 2 lakh rice varieties. Every region has a rich biodiversity that no other country has. Each and every variety of rice has been a result selection of rice varieties over generations which are adapted to different climate, soil types, topography and agronomic practices.

Genetic diversity in paddy fields is highly endangered in these last remnants of variability in high altitude areas of Kashmir. Some of the collected landraces are – *Kawa kuder*, *Kathwur*, *Mirzag*, *Shlle keau*. The Characteristics of rice landraces are they are aromatic, Bold seeded, early maturing, good swelling ability high yielding, non-sticky, sticky and sweet and nourishing. However, this rich rice biodiversity has been steadily declining.

National Seed System - both formal and informal seed supply systems prevail with us. The private sector has started to play a significant role in the seed industry over the last few years. However, the main focus of private seed companies has been on the high value low volume seeds and market for low value high volume seeds of cereals, pulses and oilseeds.

The farmer seed system is the community-based seed supply that focuses on conservation of indigenous seed varieties. There is a gap with the formal sector and have difficulty in addressing the diverse needs of small farmers in marginal areas as it offers a limited range of varieties. Small farmers in remote rural areas are generally by-passed due to poor logistics in seed diffusion.

With the informal seed system that is the community-based seed supply is Crop failures or low yields have a tremendous effect on the availability of seed. Mostly landraces and traditional varieties with low yield potential and there has been no research on these varieties.

Seed production chain involves several stakeholders, primarily the Departments of Agriculture of different States, State and National Seed Corporations, farmer producer organizations and private sector and there is no systematic working so this needs to be strengthened. Genetic diversity is the key to tackling climate change and loss of these genetic resources will deprive source of diversity. Therefore, farmers being the custodians of agro-biodiversity need to be involved in varietal selection and their seed production at local level. The formal sector needs to improve the genetic resource through participatory approach and local varieties have to be adapted into the crop improvement programs of the formal sector and the agrobiodiversity conservation can be enhanced through participatory approach.

Improving rain-fed rice productivity – some key suggestions - a. To develop technologies for diverse ecosystems with focus on stabilizing the yields in aberrant weather seasons rather than increasing the yields, b. Greater public investment in infrastructure and transport will help the small and marginal farmers in marketing of the produce which is a major constraint at present, c. 15 agro climatic zones in eastern India, 5 zones have low yield gap, 5 exhibit moderate gap and high gap exists in another 5 zones. The high zones fall in Jharkhand, Orissa and Madhya Pradesh d. Enhancing the accessibility to new technologies will be the key to bridge the yield gaps in these zones, e. Communities to be part of research and development.

Nutritional Traits- Different Rice Landrace Groups - Range of useful nutritional are observed in rice landraces and each landrace is superior compared to the other. The red rice landraces have zinc, iron and rich in magnesium, similar with the Black rice compared to the normal white rice, black rice is significantly rich in iron, zinc and magnesium. It is healthier to eat colored rice than white rice and there is a reason, with the pandemic, doctors prescribe zinc and magnesium and all the indigenous rice are rich in these nutritional values and an awakening towards its benefits would counter the COVID-19 pandemic.

## **EXPECTATIONS from the Workshop**

- **Anitha Reddy, Sahaja Samrudha**

### **INDIGENOUS VARIETAL DIVERSITY & AGRICULTURE PRACTICES**

- ◆ Need in-depth knowledge about indigenous rice varieties
- ◆ Interactive sessions on rice varieties and landraces in India
- ◆ Knowledge on farming practices for indigenous varieties
- ◆ Traditional Cultivation Practices
- ◆ Maintaining purity of varieties
- ◆ Information on extinct and existing native varieties
- ◆ Importance of desi rice conservation
- ◆ Suitable rice varieties for dry lands and marginal lands
- ◆ Practices and approaches suitable for growing rice varieties in different agro-ecological zones

### **PRODUCTION & CULTIVATION**

- ◆ Sustainable practices and mixed cropping in rice production
- ◆ PoP followed for desi rice varieties.
- ◆ Best practices of rice cultivation for good yield
- ◆ Management of crop diversity
- ◆ Learn to grow, revive, restore, propagate traditional rice varieties
- ◆ Environmental and economic benefits of growing organic desi rice
- ◆ Selection of varieties, growing different varieties on a single plot, crop rotation practices and ecological benefits of these farming practices
- ◆ How to make local paddy cultivation more beneficial for farmers
- ◆ Experience and results of adapting to climate change through sustainable rice intensification
- ◆ Efforts for climate smart agriculture – Lessons from the field
- ◆ Water & Land management of desi rice varieties
- ◆ Difficulties involved in rice cultivation and hands on information of solutions from field
- ◆ Increasing productivity sustainably for better income to farmers
- ◆ Rice farming methods that can mitigate climate change
- ◆ Characterization and evaluation of performance of promising cultivars

### **SEEDS & CONSERVATION**

- ◆ Quality seed production techniques
- ◆ Experiences of seed production from seed savers
- ◆ Collection, preservation, exchange and utilization of germplasm
- ◆ Seed sources – knowledge on direct procurement of seeds from producers
- ◆ Local seed conservation process and knowledge
- ◆ Conservation of crop genetic resources & management of a diverse set of crop populations
- ◆ Storage facilities for different rice varieties
- ◆ Seed treatments to improve the germination potential, vigor & resistance to pest & diseases.
- ◆ Selection and development and nurturing crop genetic diversity by farmers

### **CONSUMPTION & UTILIZATION**

- ◆ Types of rice and its uses
- ◆ Analysis of nutritional properties of traditional rice varieties
- ◆ Traditions and cultural practices on uses of these varieties
- ◆ Nutritional and therapeutic value of traditional rice for increasing consumption
- ◆ Methods of cooking rice to retain ecological and nutritional balance
- ◆ Flavors, culinary needs, health benefits of different varieties of rice
- ◆ Need more information on medicinal rice varieties and how to consume these everyday
- ◆ Nutritional benefits of desi rice and on how to consume regularly
- ◆ Rice varieties have different properties and characteristics are employed in treating ailments
- ◆ Rice varieties with their health benefits

### **PROCESSING, PROMOTION & MARKETING**

- ◆ Milling processes adopted for desi rice.
- ◆ Rice selected for parboiling, steaming, converting to flour, puffed and flattened rice?
- ◆ Processing steps involved for milling colored rice, keeping its nutritional quality intact
- ◆ Recommended practices of storing paddy
- ◆ Increase awareness of consumers on traditional rice varieties
- ◆ Value addition of different rice varieties
- ◆ Marketing strategies for desi rice varieties
- ◆ Knowledge about the desi varieties, their properties, market trends and scope of development.



- ◆ Marketing of organic desi rice in rural areas
- ◆ Startup online brand marketing
- ◆ Different rice varieties, its importance and marketing

## DAY 2

YouTube link for Webinar 2 <https://www.youtube.com/watch?v=ObgvYOafitw>

### RICES OF WESTERN GHATS

#### - **Shri Panduranga Hegde, environmentalist, Karnataka**

Well known activist known as the person who started Appika Movement to protect Western Ghats.

The Western Ghats of South India are rich in culture and ecology. The biodiversity contained in this mosaic of tropical forests. Rain-fed farming especially rice farming is a unique system of farming in the western ghats. Here agriculture is completely linked to the forest ecosystem, the resources are from the forest—water, green manure, resource to prepare FYM, soil moisture come from the forest. My native village in the hilly region, which constitutes the Western Ghats, which is the global hotspots of diversity in India. The Ghats is rich diversity of many agricultural crops including rice. The paddy fields are located in the scenic foothills of the range.

The diversity is so enormous ICAR and NBPGR did a study and it revealed that almost 2760 accessions are there in Western Ghats, the diversity is due to the different ecological zone. And almost 500 indigenous rice varieties are known to be cultivated in this region. Traditional rice cultivars and cultivation are very specific and farming system that has been practiced in this region. to mitigate climate change we have a variety called '*Kagga*' is resistant variety and resistant to Salinity.

Also packed with nutritionally, environmentally and locally superior qualities, traditional cultivars hold the key for sustainability in rice cultivation and also varieties are rich in medicinal properties, which has been less exploited though there is a practice of using local landraces for this purpose, like "Atikaya" variety for general health promotion and "*Karibatta*" for skin ailments and in treatment of herpes. In this context it would be worthwhile to test and document the therapeutic values of traditional rice varieties. There are several other varieties like *Karigajivili*, *Karjaddu*, *Kempusannakki* and *Sannakki Batta* some of these are submerged varieties also and the ecosystem of submerge will enhance the medicinal properties of the rice varieties. Evolved locally and have thrived for generations, these varieties have fewer pest and disease issues and have the ability to withstand climatic variations. Their medicinal, nutritive and safety values are considerable the traditional rice cultivation is less costly.

But now such traditional farming is on the decline as most of the rice-growing farmers face a lot of issues. The livelihoods of local people are increasingly vulnerable to the policies of government-sponsored agriculture programs.

The rainfed farming is so unique here that once the harvest of rice then we have migrants with their herd grazing the paddy residue. The policymakers have categorized grasslands as "wastelands," but these are grazing lands for the migrant herders. The ecosystems such as grasslands can feed into agriculture and allied primary production livelihoods such as pastoralism.

We need to explore the dynamics of traditional rice cultivation in the North Karnataka regions and the inter-linkages and supporting sustainable agriculture, empowering small farmers, ensuring livelihood and healthy lifestyles and tackling climate change, among other issues of rice farming like labour problems, good market for traditional rice.

Some of the farmers have strived to revive our traditional farming practices with our Native rice seed varieties one such is, Deva Rao along with his son is growing 155 varieties of paddy in about 6 acres. They also grow more than 80 varieties of wild mangoes and 50 varieties of jackfruit along with arecanut, coconut, and vegetables. They till their own land, sow seeds, harvest and market the produce all by themselves, without employing any labourers and have set an example that agriculture is profitable. Such cases are few, we need innovative government support policies to strengthen and sustain the traditional rice farming system and cultivation of traditional rice varieties in the Western Ghats. Most schemes have been ineffective, because of absence of financial incentives and research on yield maximization, input suitability, tolerance to environmental stress and most importantly marketability of these traditional varieties.

MNREGA can be linked to agriculture, the people under the MNERGA be asked to work in agriculture fields and that would help solve the agriculture labour problem during sowing, transplantation of paddy, and harvesting of crops etc., also this would reduce the cost of cultivation. The idea has to pay wages of labour in agricultural operations from MGNREGA

## SESSION - 2

### LIVING TREASURES OF DESI RICE

#### - Soumik Banerjee, Co-Convenor Bharat Beej Swaraj Manch

Wild rice – *Oryza* grows in the ponds. It grows on its own and no one plants them. The wild rice has a very lengthy awn and is a perennial variety. This is consumed in many parts of world as well as India. Also, this is the parent of the rice we consume – *Oryza sativa*.

Splendor of Diversity – from the wild aquatic grass, Indian farmers over the centuries cultivated thousands of varieties of rice. No other cultivated crop has been developed to such an extent to fit thousands of ecological zones of the country. Adjusted over long periods to the ecosystem of their region and environmental and climatic variations, it ensures output even in bad years. India's varietal diversity is considered the richest in the world with the number of cultivars of more than lakhs. In NBPGR there are more than 1 lakh accessions. As compared to other crops the diversity of rice is huge.

Indian rice possess a wide range of morphological and physiological traits

- 60 to over 200days to attain maturity
- Growing in varied elevations from sea level to a high altitude. Rice is grown in varying terrains.
- Rice is mainly grown in rain-fed areas that receive heavy annual rainfall. Grows in places that receives 200cm annual rainfall and also in 100-200cm rainfall areas. Growing in 6-15m of water also.
- Adapted to different seasons in both dry uplands to submerged conditions
- Tolerance to different environment stresses like drought floods. to drought-affected upland and rain-fed lowland to very deep-water conditions
- High resistance to diseases and pests like – blast, stem borer.
- Rice grains show enormous diversity with colors ranging from complete purple to red to white.
- Grain lengths of 3.5-14mm, breadth from 1.9-3mm. there are short, long, slender, glutinous, scented and non-scented varieties.

Deep water Rice of Eastern India – Deep water rice can tolerate flooded conditions for 30 or more days during growing stage, and at depths of 100cm or more.

Globally 7000 varieties of deep-water rice, with 2500 from Bangladesh alone. *Keralasundari* a popular variety of Sunderbans is non-scented, bold rice and a good yielder, tolerates submerged conditions for

long periods. Farmers even to this day are growing these varieties. It shows that they are stable, and have stood the test of time. *Gamra* is a variety tolerant to both flood and drought. There are varieties that show multi-tolerance to submerge and drought.

Saline tolerance – these varieties survive the saline conditions in Sundarbans once cyclone the saline water from the rivers and the seas leave the land uncultivable for years to come and no modern rice variety can withstand the saline conditions, but these rice varieties can grow. Some of the saline tolerant rice varieties are – *Dudheswar, Hamilton, Keralasundari, Lal getu, Sarabha Darsal, Nona Bokra and Talmugur* and a number of folk rices that thrive in saline conditions.

Red Rice of Central Indian Highlands – Red rice possess anthocyanin, antioxidant properties. The zinc and iron content of red rice is 2–3 times higher than that of white rice.

Black Colored Rice - black rice is relatively unknown to most Indians. It is indigenous to north-east India and is extensively grown in Odisha, West Bengal and Jharkhand. It is commonly eaten in Manipur because of its medicinal value. A popular pudding is prepared in these regions during festivals. Black rice contains more Vitamins B and E, niacin, calcium, magnesium, iron and zinc compared to white rice and with the COVID, this could be an ideal found with all nutrients. It is rich in fibre and the grains have a nutty taste. The anthocyanins not only act as antioxidants, they also activate detoxifying enzymes.

In our diversity block we have 12 black rice varieties, the characterization of all the 12 varieties exhibit different traits other than color, Taste, growing period, height, aroma each variety has a unique feature. China is famous for black rice and they have more than 60 to 70 varieties and it was a forbidden rice as only Royals consumed this variety. But not in India it is most common and the variety must have come from Myanmar and spread all over India through the traders, the Chettiar community from South India, who brought this variety.

Cluster Rice for increasing yields – clustered rice varieties have a special place in increasing yields. Dr. Richharia collected 48 cluster rice varieties from Chhattisgarh. These varieties were crossed with normal ones to produce F1 seeds and they were clonally propagated. A technique used to increase yield and is a common practice among the tribals of Chhattisgarh.

Purple leaf paddy – were maintained for rouging and eradicating Wild rice from the fields. Dr. R H Richharia had identified 22 purple leaf varieties in Chhattisgarh alone. He had shown the relationship of pigmentation and yield and how this could be used as a marker for roughing out undesirable characters at F2 stage from a field population raised from clonally propagated F1 plants. Some varieties - *Njarbhat, Sengel, Ikkomota, Khara*.

Paddy varieties with wings - *Ramigali* from Chhattisgarh has sterile lemmas elongated as wing-like appendages. We have only two varieties in our demo plot and Dr. Richharia said that these are rich in protein.

Curved grains – there are varieties from Chhattisgarh, which have a curvature structure and these varieties find mention 2700 years ago in Charak Samhita as *Shakunrhita*. These rices are known to have medicinal properties of reducing *Pitta*. Dr. Richharia had documented them as Rice varieties resistant to Blast and Gall Midge. These varieties remind us of the time-tested merits of Seed Sharing and Varietal Purity maintained by our Farmers. Curved grain rice – *Bori dhan, Dogra mecha, Meso dhan* and *Nadiya raso*.

Traditionally specific rice varieties were used for specific purposes. Every culture had its list of rice for specific seasons and purposes, which were dependent on the growing season, climate, and cultural observances. Some rice – *Dudheswar, Lal dudheswar, Lajni super* are varieties from Chhattisgarh and all are red fine rice, *Baghir Jhuli* is again fine rice and is red in color, *Hati dhan* is a clustered variety and has an aromatic rice, *Phul pakri* cooks very fast, *Aghani bora* a unique variety from Assam, is a no boiling rice.

This variety needs no cooking, just soak in water for an hour and the rice is ready to eat. This rice is eaten by Soldiers in the border areas. *Ona matta* from Kerala, high satiety rice, even eating small quantity of rice fills the stomach and you do not tend to over eat. Similar is *Koya* from West Bengal and *Chindmouri* from Chhattisgarh and *Thanvalai kanna Matta* from Kerala. *Tikasturi* is Green rice and *Pick rice* is from Meghalaya and *Ram Laxman* and *Jugal* are double grained rice.

Fragrant rice is with aroma and the diversity is very rich in these cultivars from different rices. High yielding varieties of folk rice- it is a myth that desi rice doesn't have good yield but there are varieties that farmers have bred for high yield only. HYV is high response to [pesticides, water and not high yielding. Like Assam *Chudi* gives 6tons and *Jhumpuri* from Odisha gives 6.2mt/ha, *Kanchan safari* from Chhattisgarh gives 9.2tons and *Nagpuri gurnatia* gives 7mt/has and *Narkelchori* gives 8 tons/ha.

Creators of Upland rice- rice were developed not by one farmer but from generations of farmers. Farmer-selected crop varieties and developed not only adapted to local soil and climatic conditions, but also fine-tuned to diverse ecological conditions and cultural preferences. A wide genetic base provided a 'built-in insurance' against crop pests, pathogens and climatic vagaries. Farming rice makes cultures more inter-dependent.

### SESSION-3

#### RAINFED RICE CONSERVATION INITIATIVES

Presentation -1

##### ON-FARM FIELD EXPERIENCE

###### - Avil Borkar, Gramin Yuva Pragatik Mandal (GYPM), Maharashtra

GYPM was initiated by Avil Borkar and his like-minded friends, with focus on social change and sustainable development. The organization has been working with marginalized people for their rights and socio-economic development.

He shared the study details the performance of local indigenous rice varieties was taken up in Bhandara on a 10acre plot. This experiment was to prove that indigenous seeds perform better to climate change and local conditions than the hybrids. Black rice took 160days and gave highest yield, also fetching a good price in the market. *Kalikam* variety despite very little water yielded almost 22kgs seeds and the variety was marketed at a good price. Even though the crop of the neighboring farmers was damaged due to unfavorable conditions, yet the local variety performed well without any damage to the crop though there was no use of pesticide or fertilizers.

The organization has concentrated on in-situ conservation of rice diversity in three districts of Bhandara, Gondia and Chandrapur covering 6 blocks in 36 villages. Seed multiplication plots were developed for four varieties of indigenous paddy on 499 plots covering an area of about 157 acres with more than 700 farmers. Characteristics of 25 varieties of rice were documented.

Community-led Seed Conservation Model – initially it started with selection of villages that led to Participatory Survey of seeds. Then of Collection of Samples and then Data collection from different sources and Sample collection from seed savers, these varieties were stored in Central Seed Bank that has been set up at the Institutional Level. The Morphology and Agronomy Characterization was undertaken at the Demonstration plots. During harvest knowledgeable farmers and seed experts are invited and seeds are selected. These seeds were preserved by establishing community level seed banks, at every cluster that are managed by the farmers. Community level seed production and seed exchange has been with Formation of Seed Savings Committees.

CSB consists of 10 members consisting of 2 farmers from each village. The Seed Saving Committee has the right to supply the seeds. CSB takes care of seed purity and Seed exchange within clusters and villages.

Presentation – 2

## **DESI RICE PROMOTION**

### **- Bhoopendra Singh, Sangata, Chhattisgarh**

Sangata five domains viz promotion of agro-ecological farming, watershed, issues of women and child health, nutrition and their rights, human resource development and policy advocacy. Networking with Save our Rice Campaign has focused on Promotion of indigenous rice seeds and organics practices.

Bhoopendra said that the objectives with promotion of indigenous rice have been with Conserving Rice Ecosystem, Sustaining Rice Culture & Diversity, Protecting Traditional Community Wisdom, Preventing GMOs and Toxics and Ensuring Safe and Nutritious Food for all in Surguja District of Chhattisgarh.

Initially there were no seeds with the farmers, so the organization conducted mapping and documentation of indigenous seeds and by sourcing the seeds, they were distributed to farmers, this began our conservation and promotion of rice seed varieties. The seeds were multiplied and stored by developing seed banks and rice resource centers. The multiplied seeds were re-distributed to farmers for production of more seeds. Rice Development Blocks with around 50 different varieties of rice have been initiated.

Increasing the production of Paddy by application of SRI Method in Rainfed areas and protecting rice ecosystem and biodiversity.

The farmers about 3600 have been conserving more than 72 varieties of indigenous rice in Surguja Division.

Scented rice – *Jeeraful, Kaljeera, Vihnsbhog, Kasturibhog, Javaful, Bisni, Laxmibhog and Lawanful*. Red Rice – *Karahani, Jenjale, Bahasal, Godadani, Bhaya*. Medicinal rice – *Karahani and Barahasal*, High yielding – *Chhinamauri, Kalchar, Safari, Mansuri, Rudra, Makarkam*, Fine variety – *Sinki, Jhinga paras, Jhili and Lalo*, other varieties are short duration, *Uplan, Medicum* are Low land varieties.

Presentation - 3

## **INTRODUCING THE JOURNEY OF FIAM, An initiative towards ecological living**

### **- Chinmoy Das, FIAM West Bengal**

Forum for Indigenous Agricultural Movement (FIAM) works to conserve indigenous seeds variety and cultivates chemical free food. Chinmoy said that family farming and Agro-ecology can feed the world and organic farming can help save world from global warming. FIAM started with a group of young people from West Bengal coming together to revive indigenous crop varieties, and educate youth from villages to tread on the steps of their forefathers with passion and to bring back the glorious paddy heritage of Bengal, by cultivating folk rice varieties using environment friendly agricultural practices and eventually ushering food security into their villages.

The revival movement started with 80 farmers, from nearly 20 villages with just 10 varieties in barely 0.73 hectares of land, and today they have revived more than - 430 indigenous rice varieties, 12 different potato

varieties, 11 brinjal varieties, 5 different bean varieties, 6 wheat varieties, 14 tomato varieties and a lot of vegetable varieties. The organization has been working in Uttar Dinajpur, Dakshin Dinajpur districts of West Bengal.

Among the paddy '*Tulaipanji*' is one of the finest aromatic variety which is endemic to the northern part of WB. '*Bahurupi*' is one such variety that yields much higher than the hybrids. The folk varieties are not only faring better in this regard, but also require much less water in comparison. Further, they are largely climate resilient, able to withstand weather aberrations, while maintaining the yield per hectare, as against their chemically grown counterparts.

Indigenous crop varieties are the best solutions to the problems of erratic rainfall, whether excess or scanty. Last year there was flood in the region and chemically grown high yield varieties were all lost, but many of our indigenous seeds managed to survive.

The bold, short grained *Jaldhapa*, *Kalam*, *Shole*, *Langalmuthi*, *Kerala Sundari*, *Hetomari*, continued to sustain themselves under about three-four feet of water for over a week. The area floods every year and Hybrids are unable to stand the flooded conditions. Varieties like *Sabita*, *Narayankamini*, *Patnai* are flood tolerant lowland varieties that stand beneath 1.5 feet-2 feet of water. Several of our on-farm conservation plots have fared well even with changing climate and this has been an eye opener for many of our conventional village farmers, who were unable to cope with their crop losses, put together with their increasing cost of chemical inputs, lowering of soil fertility and yields.

Several seed festivals are organized and even the organization participates in such festivals to create awareness and also become part of the national and global organic network.

### DAY 3

YouTube link for Webinar 3 - [https://www.youtube.com/watch?v=nIPwBFU22\\_k](https://www.youtube.com/watch?v=nIPwBFU22_k)

## ESTABLISHING RICE DIVERSITY BLOCK AND CHARACTERIZATION

### – Sanjay Patil, Executive Program Director, BAIF Maharashtra.

Sanjay described the community involvement and BAIF's concentrated efforts in preservation of native seeds of Rice. He said Rice satisfies basic food demand of our population. In the interior blocks of their project area, a large number of farmers still cultivate traditional varieties which have been grown in the area for centuries. The varieties are selected based on the land type, viz., lowland, highland, upland etc., socio-economic, cultural needs, eating quality, feed value are some of the other considerations during selection of this indigenous biodiversity.

Innovative practices and each variety were conserved on a participatory - community driven model for conservation. He simplified the characterization of varieties so that community were also part of the research, this was a model to make all the stakeholders of the project in 6 location in Maharashtra - Jawahar, Dhadgaon, Etapalli, Junner, Akole and Kudal 6 blocks of Maharashtra. Conservation of paddy diversity and working for the last 30 years with BAIF-Maharashtra Sanjay stressed that blending indigenous knowledge, documentation & scientific evaluation, developing community seed networks and community lead programs like awareness programs was necessary to take analytical measurements of all the growth parameters for proper documentation and acceptance by the scientific community. Also, the special traits observed can be utilized commercially by promoting different varieties for special purposes: different rice have end use as daily cooking, papad making, fragrant rice, puffed rice etc.; for medicinal

uses such as anti-diabetic, treatment for anemia, for lactating mothers, for convalescent patients etc; for disease resistances, s.a. leaf blight, midge, spots etc; additional nutritive values as high protein content, pigments, vitamins, higher mineral contents, low glycemic index and so on. All these properties need validation before promotion.

The four 'C's approach – Conservation, Cultivation, Consumption, Commercialization - Conservation The structure at the International, State and Institution level , at the International level – Biodiversity International – National – NBPGR, PPV&FRA, NBA, State Level – Dept. of tribal affairs , Dept of agri, State Livelihood mission- District level KVK, Extensions – Institution level – Cluster Seed Bank and at Village level – CSB- Seed saver committee – seeds aver group 1, seed saver group 2, seed saver group 3

Community led seed conservation Model – Participatory survey – Data Collection from Secondary – Specific survey of seed savers – Germ plasm collection from seed savers – Establishment of Diversity Blocks and Seed Banks – On-farm Traits – Characterization and Evaluation – Participatory Seed Production with Value addition and Marketing linkages.

Community led agrobiodiversity conservation programme is in 7 clusters and 6 community seed banks have been established with a ex-situ gene bank and around 600 plus accessions of diverse crops are under cultivation with around 4679 families on 1175 ha, and around 8538 nutri-gardens.

Establishing Rice diversity Blocks – blocks are maintained for On-farm Maintenance, and the Participatory Varietal Selection materials the preference farmer varieties taken from here. Diversity blocks are for Morphological Characterization, Performance studies and identification of worthy selection. The diversity blocks are maintained of seed collection from different locations and these seeds are raised in nurseries and then transplanted, with continuous monitoring as any off type are immediately removed, then farmers on a participatory method selected the best varieties among the maintained.

#### Sample Characterization Details

|        |                              |   |
|--------|------------------------------|---|
| Farmer | <b>Name of landrace</b>      | Wada Kolam  |
|        | <b>Accession no.</b>         | BAIF /wada/Rice/WK 8  |
|        | <b>Season of Cultivation</b> | Kharif  |
|        | <b>Days to maturity</b>      | 120-125 days  |
|        | <b>Plant height</b>          | 121-125   |
|        | <b>Average yield (q/ha)</b>  | 20-25 q/ha  |
|        | <b>Panicle Characters</b>    | Drooping, Semi-erect branches, well-exerted panicle, strong secondary branching, easy panicle thresh ability, 8-10 tillers per seedling, clum attitude No.of grains/Panicle (320-325) |
|        | <b>Grain Characters</b>      | Straw colored grains, Short Slender, White, non-scented, Straw colored Apicus   |
|        | <b>Special features</b>      | It is cultivated in upland land under rain-fed conditions. Used for daily cooking, good swelling, non-lodging   |

Breeders Experimentation – Identification of unique plant with special characters. While developing new varieties farmers have to observe for different plants among the population and select plant with characters of grain size, grain color, Panicle Shape, no of grains/panicle, Plant height, good tillering ability, growth habit

#### SESSION - 2

#### ESTABLISHING DESI RICE SEED BANK

- **Sudam Sahu, Indigenous Seed Conservator, Orissa**

Sahu, a progressive farmer, farmer-breeder and an individual seed conserver from Bargarh, Orissa state narrated his journey on setting up a community seed banks and how he popularized black rice varieties. Sudam Sahu is from Bittu Bhoomi an organization working with conservation of Argo biodiversity in Orissa. He started both the seed bank and the grain marketing with the objective to preserve the viable gene pool for the future generation and also to make agriculture viable through adapting to organic methods of cultivation.

The Community Seed Bank has organic farmers as its members and the bank has more than 600 indigenous rice seed varieties of – black rice, red rice, aromatic rice, medicinal rice and more than 100 vegetables seed varieties. Desi Bihan Surakhay Mancha was the group initiated. He has been giving seeds free of cost to small and marginal in his area. That is how he was able to popularize indigenous varieties.

Five years back, Sahu collected two varieties of black rice seeds from Sambhav Farm in Nayagarh which he has been preserving to date. In that one variety was Kalabati gives a yield in 150 days both plant and grain are black in color.

Over the next few years, he was able to collect more varieties of black rice and presently has about 12 varieties of seeds of black rice, and four varieties - *Kalabati*, *Kala Maliful*, *Handisal* and *Debanna* has a huge demand even in other states and he mobilized 55 farmers for growing these four varieties over an area of 70 acres. And he sold 70 quintals of seeds to farmer in other States.

The Community Seed Bank sells both seeds as well as rice at the same price in the beginning and then to popularize black rice in the region, the prices were revised accordingly and this encouraged other farmers to start growing *Kalabati Dhana*. Another variety of black rice -*Buddha Bhog* – is also a good variety and a boon for diabetic patients as it helps in controlling sugar levels.

Seed exchange and seed festivals are organized to popularize indigenous seed conservation. They have spread seed conservation and growing of desi paddy varieties in western parts of Orissa to more than 10000 acres and more than 2000 small and marginal Farmers. The organization Bhattu Bhoomi successfully organized a state level seed saver meet bringing in seed savers from 8 districts and showcased numerous indigenous seed varieties.

### **SESSION - 3**

#### **VISIT TO RICE MUSEUM – Virtual**

- **Boregowda, Rice-breeder, Seed Saver, Karnataka**

Boregowda spoke about the way he took to organic farming in 2004, with indigenous varieties and the journey of his seed conservation efforts in association with Sahaja Samrudha, that strengthened his resolve in preserving indigenous varieties. He says that his focus on collecting traditional varieties of rice and growing them is necessary as the coming generations may not even know of the existence of these varieties if these are not conserved.

He took us on a virtual tour to the Rice Museum, located on the first floor of his house which is the brain child of Boregowda. Set up 2009 the museum has 210 varieties of indigenous rice varieties on display all of them collected and preserved by Boregowda.

The walls of this small museum have paintings that depict the process of paddy cultivation, right from preparation of the soil to sowing, to transplanting the seedlings, ploughing them, harvesting and finally, showcasing the post-harvest process.



Apart from paddy varieties, the museum also has varieties of ragi (finger millet), which is extensively cultivated in Karnataka. Farming tools of the yesteryears, including wooden ploughs, sickles, cane baskets, and metal vessels to store grains, help visitors learn about paddy cultivation.

Some interesting exhibits are different varieties of festoons made creatively of naturally dried paddy ear heads. Traditional spherical containers made from straw to preserve rice all symbols of the eco-friendly and sustainable way of life of the yesteryears.

Boregowda also shared his experience of developing a paddy variety – ‘Sidda Sanna’ named after his mother Sannamma and Father Siddappa. The variety is small, fine grained rice, with excellent cooking quality, similar to Sona masuri. The variety has gained popularity with organic farmers and consumers in Karnataka. Sidda sanna rice is an all-purpose rice, which is easy to grow, resistant to pests and diseases, and suitable to cultivate in both the seasons, soon became popular among growers. The tasty, superfine grains attracted the consumers as well.

#### **SESSION - 4**

##### **CONSERVATION OF RICE DIVERSITY ON-FARM**

- **Syed Ghani Khan, a recipient of Plat Genome Saviour Award, Kirgavalu, Mandya District, Karnataka**

Ghani has a Bachelor's degree in Archaeology and Museology and always dreamt of creating a museum but never thought that he would be setting up a rice living museum.

Ghani said that People call us farmer 'Anna daata' but I realized that I am visha data this realization made me change to organic farming and desi varieties.

The Rice Diversity Center in Kirugavalu in Malavalli Taluk has been setup by Syed Ghani Khan. This is a living museum displays more than 1,300 varieties of native rice, all being preserved on his farm. The paddy varieties are an outdoor display that he grows and it is a living museum. The varieties of rice are on a 30 by 40 square feet land, and this is to show how the different kinds of paddy look. The paddy variants are named with details like crop duration, stalk height, rice color, region of origin, season, yield and typical characteristic on placards that are placed near each variety plot and are printed in Kannada and English.

He has propagated the traditional varieties of rice and also and also distributed seeds to other paddy farmers. The rice varieties have adapted to different climatic conditions and the best seeds are selected every year and planted, these seeds are grown and multiplied and shared with other farmers. He does not sell his seeds to big companies though he is offered a better price. His collection started with a rice variety that no one was able to recognize, native variety of rice that used to grow a long time ago in Mandya but had since been lost.

His rice museum boasts of more than 1000 indigenous rice varieties from all parts of the country. While most of the varieties of rice originate from India, the museum is also home to varieties from Myanmar, Thailand, Pakistan and several other parts of the world. Syed has transformed the farm into a bio-diverse ecosystem, which is host to over 60 species of birds. Maintaining this living museum and perpetuating the lost knowledge to the future generations is his only passion.

#### **SESSION – 5**

##### **ON-FARM CONSERVATION OF PLANT GENETIC RESOURCES**

- **Ananda Theertha Pyati, Sahaja Samrudha**

Seed a 'community resource', evolved over thousands of years, has transformed into a 'commercial resource. Seeds are of critical importance to the food security of the present and future generations. They are threatened due to various factors but the main has been replacement of landraces and farmers' varieties by widely adapted improved varieties and hybrids.

India had many thousands of landraces that were - resistant to pests, diseases, grew well on poor soils and also sustain under the changed climatic conditions.

Conservation of the landraces was threatened so there was an erosion of diversity.

Two prevalent methods to conserve the rice seed diversity are in-situ and ex-situ. In ex-situ conservation the genetic resources are conserved outside their natural habitat in identified gene banks.

In-situ approach of conservation is at the level of ecosystems and natural habitats, and it includes the maintenance and recovery of viable populations of species in their natural surroundings, where they have developed distinctive properties.

On-farm conservation is in-situ conservation of plant genetic resources at farmer's field and a Sustainable maintenance of landrace. Access to farming community, Farmers are actors, Emphasis is on community seed supply and an important aspect for sustainable agriculture, Farmers choose the seeds, Low cost, need based and decentralized.

Conservation and Revival of Desi Rice – Sahaja Samrudha has been able to conserve diversity on-farm and the repository of more than 1000 varieties of rice, on farmers' fields and also in community seed banks. The revival of rice heritage through on-farm conservation of more than 600 rice-conservers and farmer-breeders from 15 districts, conserving more than 1000 varieties of paddy.

On-farm conservation, have an advantage over ex situ methods since they provide for a natural evolution to continue, building up traits that adapt to specific eco-geographical region and those matching the requirements of local tribes, communities. New and more adapted types are evolved and thus diversity gets augmented.

Collaborations with Research Stations – KVKs and State Agricultural Universities have helped regional research stations to maintain the landraces, and purity of seeds are maintained and the research stations have helped multiply rice varieties. It is important for State Agricultural Departments to develop crop diversity gardens for the locally adapted crops, at least on one farm per district, and focus on awareness generation on crop diversity conservation. It is important for State Agricultural Departments to develop crop diversity gardens for the locally adapted crops, at least on one farm per district, and focus on awareness generation on crop diversity conservation.

Community Seed Banks - are not just a store where seed is kept for distribution or marketing. It is a system of traditional agriculture where farmer plays a key role in creation, maintenance and promotion of local crop diversity. Community themselves saves and exchange seeds and also has established Seed Savers Network at national level.

Impact of the on-farm conservation has been - Increased in desi rice growers' number,

Sale of desi rice, Awareness on nutritional value, Appreciation to farmers and both organization and farmers have received several awards in recognition their efforts.

Appreciation has been Honorable Finance Minister tweeting about a farmer's initiative in Karnataka.



## SESSION - 6

### RICE CONSERVATION IN THE BACKYARD

#### - Satyanarayana Beleri, Kasargod, Kerala

An innovative effort in conserving various varieties of traditional rice seeds in Satyanarayana Beleri, a farmer from Kasargod district of Kerala has been cultivating paddy in his backyard. He is saving heirloom paddy varieties that are grown in polybags in open space. Satyanarayana explains that his method requires less effort and resources and as many as 200 landraces can be conserved in an area of 200 square meter. More than a decade ago, Beleri had bought a handful of traditional *Rajakayame* paddy seeds from pioneering organic farmer. With experiment on one variety, today he has more than 200 paddy varieties.

About 10-20 seeds of each paddy variety are sown in different paper cups filled with pot mixture and are labeled accordingly. Optimum moisture is maintained in the cups to ensure the germination of seeds. The seeds sprout in three to four days, and after 10 days, these seedlings in each paper cup are transplanted to polybags filled with compost mixture and are placed close by and until flowering the seedlings are provided nutrients with 'Jeevamrutha' every week. After flowering begins, each polybag is shifted to a shallow water pond covered by a tarpaulin sheet and protected by a bird net. This water pond and the net help protect the seeds from birds and rats. While transplanting the crops, care is taken to avoid cross-pollination by keeping varieties with the same date of flowering in distant places inside the pond.

Collection of seeds – seeds of different varieties are harvested separately sun-dried and then stored in paper bags. Close to 150grams of pure seeds can be obtained from each polybag and are used for the next sowing.

Important varieties in his collection are *Chitteni, Akrikaaya, Narikela, Suggi kayame, Vellatuven, Gndhasaale, Jeerige Sanna, Ghangadale, Kumkumsaale, Kalame, Kottambarasaale, Karigajavile, Raaja mudi, Jugal Kagga, Karijeddu, Parambu Ucchan, Mysooru mallige.*

## **DAY 4**

YouTube link for Webinar 4 -<https://www.youtube.com/watch?v=7APC1tXEZ7Y>

### **SESSION - 1**

#### **SYSTEM OF RICE INTENSIFICATION (SRI)**

- **Jacob Nellithanam, Convener of Bharat Beej Swaraj Manch**

Jacob Nellithanam, a farmers' rights activist, worked closely with Dr. R H Richharia and started the Richharia Campaign, a movement that has revived the work of the late scientist and has been collecting indigenous seeds and then redistributing them.

#### **SRI in Rice – System of Root Intensification, transplanted and direct seeding**

The concepts of System of Rice Intensification help farmers adopt practices based on their local conditions. Rice establishment methods is direct seeding of rice, system of rice intensification and transplanting of rice.

Rice-cultivating farmers, particularly those who have less than one hectare of land, have experimented, refined, adopted SRI method. While many individuals, civil society organizations and farmers mainly have played a major role in promoting the SRI method and also farmers' contribution to the knowledge of SRI is significant but it has been ignored.

System of Rice Intensification (SRI) emerged in the 1980's as a synthesis of locally advantageous rice production practices encountered in Madagascar. SRI is a combination of several practices those include changes in nursery management, time of transplanting, water and weed management. Its different way of cultivating rice crop though the fundamental practices remain more or less same like in the conventional method; it just emphasizes altering of certain agronomic practices of the conventional way of rice cultivation. SRI is not a fixed package of technical specifications, but a system of production that enhances the root growth with four main components, viz., soil fertility management, planting method, weed control and water management.

Farmers work on field for 6 months and would want their produce for both self-consumption and some for market, to earn them an income. And as yield matters, SRI increases yield. A comparative study of rice yield in Punjab was conducted and it showed in 1980-81 and the yield was 40qt/ha and we had Paddy varieties from Basthar, Madhya Pradesh and other tribal areas which yielded more than 40-45qt/ha. Using traditional varieties, you can increase the yield and achieve doubling increasing the land performance.

Direct Seeding of SRI method of Chhattisgarh – this method was followed in Chhattisgarh and the technique is seeds are sown in the field directly rather than transplanting the seedlings. Drill is used and the paddy seeds are ploughed into the soil.

System of Crop Intensification – SCI and producing more with less

SRI methodology is based on four main principles that interact with each other:

- Early, quick and healthy plant establishment
- Reduced plant density

- Improved soil conditions through enrichment with organic matter
- Reduced and controlled water application

Based on these *principles*, farmers can adapt recommended SRI *practices* to respond to their agroecological and socioeconomic conditions and to any crop – Sugarcane, Millets, Pulses, Wheat, oilseeds, to increase yields.

Elements of SCI – Healthy Seeds & Plants with vigorous early growth with focus on Root Growth

- Providing optimally wide spacing of plants to minimize competition for nutrients, water, air and sunlight
- Keeping the top soil well aerated through appropriate tools to improve air and water circulation
- Enrichment of soil with organic matter to enhance fertility and structure to support soil biota
- Water management to favor plant-root and soil-microbe interaction avoiding hypoxic soil
- SCI can give spectacular yields without the need to change the seed variety and / or incurring high cost farm inputs.

SRI is transplanting of seedlings –

- Young seedlings for early transplantation
- Developing nutrient-rich and un-flooded nurseries
- Ensuring wider spacing between seedlings - ensures optimum space for efficient utilization of resources.
- Transplanting the seedlings singly
- Frequent inter-cultivation with weeder - Using weeder is of primary importance and weeder is used between rows after 9 to 10 days after planting and at an interval of 15days
- Un-flooded irrigation - root zone to be kept moist, not submerged
- Using organic manure and not synthetic fertilizers - supply essential nutrients, and creates favorable conditions for soil microbes being a source of carbon.

Root growth is good in this method.

SCI yields

| CROP          | STATE          | YIELD MT/Ha |
|---------------|----------------|-------------|
| Paddy         | Chhattisgarh   | 9.2         |
| Wheat         | Bihar          | 4.6         |
| Maize         | Assam          | 7.5         |
| Sugarcane     | Odisha         | 119         |
| Barley        | Chhattisgarh   | 5           |
| Rapeseed      | Madhya Pradesh | 5.7         |
| Pigeon Pea    | Karnataka      | 4.6         |
| Finger millet | Karnataka      | 5           |
| Green gram    | Bihar          | 1.87        |
| Lentil        | Uttarakhand    | 1.4         |
| Soybean       | Uttarakhand    | 3.3         |
| Kidney beans  | Uttarakhand    | 3           |
| Peas          | Uttarakhand    | 3.02        |

One approach, multiple solutions

- Ensures food and nutritional security and sovereignty
- Increases farm income
- Reduces input cost and improves sustainability
- Can help in tiding over rising food imports especially Pulses and Oil seeds
- Climate resilient and Water efficient

## SESSION - 2

### CLONAL PROPAGATION SYSTEM

- **Soumik Banerjee, Co-convenor Bharat Beej Swaraj Manch**

Soumik spoke about the CLONAL PROPAGATION SYSTEM a traditional system that had been followed but has never seen limelight. This Technique was demonstrated by Dr R H Richharia at the Central Rice Research Institute (CRRI) -Cuttack and also encouraged many to experiment on this method.

Even a single pure seed can be multiplied by this technique and a normal rice seeds obtained from clones which give higher production than from seed to seed crop. This is because the grains obtained from clones are fully mature and healthy so there will be least chaffy grains due to good tillers plants.

The Clonal Propagation Technique was demonstrated by Dr R H Richharia at the Central Rice Research Institute (CRRI) -Cuttack in 1960s.

The journal Nature Vol-194 published on 12th May 1962 has his paper on Clonal Propagation.

In this manner, even a single pure seed can be multiplied by this technique and a normal rice crop can be raised during the following season from seeds obtained from clones which give higher production than yields obtained from seed to seed crop. This is because the grains obtained from clones are fully mature and healthy filled with least percentage of chaffy grains due to the physiological efficiency of tiller plants.

Dr Riccharia had observed an increased yield of 17 to 61% as compared to culture from normal seedlings; these seeds also were more resilient to pests and diseases.

In this manner any promising rice variety in any region can be spread rapidly within a season and yields can be improved.

This method is particularly useful in flood prone areas; older rice seedlings from unaffected plots can be utilized as a source of clones and transplanted. Dr Riccharia had observed that rice clones resist water submergence and thus are effective in flood prone regions.

Farmer Experimenting with CLONAL PROPAGATION SYSTEM in Paddy with *Keralasundari* Variety was carried out by Bhairab Saini of village Panchal in Bankura District, West Bengal in 2018. With 20 no's seeds and 20 Seedlings were transplanted and the tillers of the 20 seedlings were carefully separated at 22 days to 103 seedlings that were again transplanted. 83 survived (80%) that provided 276 seedlings which were further transplanted, where 260 survived (94%) that provided 820 seedlings which were finally transplanted after 90days and 808 seedlings (98%) finally survived that gave 25.12 kg in 46.2 sqm equivalent to 5.44 MT/ha.

BOLON- indigenous Flood Management Practice – this was again popularized by Dr. Richharia and is more prominent in flood-prone area, where there is always risk of early transplanted seedling getting submerged or washed away, or leading to death of seedlings and additional costs for re-transplanting. In response to this environmental problem, farmers practice a system of double transplanting of rice, locally known as Bolon in Bangladesh and West Bengal, to avoid crop failure from submergence. One-month old seedlings are transferred to another field with dense transplanting, and then re-transplanted to the main after the risk of flash flood is over. Scientists argue that the system would have lower yield and higher costs, thereby lower profits compared to single transplanting, but farmers disagree.

Bolon crops are healthier with longer panicles more grains and higher yields as compared to conventional transplant. Dr. Richharia had demonstrated use of separated tillers as seedlings from already transplanted

crop instead of double transplantation of aged seedlings as an alternative to BOLON in flood prone areas where seedlings have been lost due to inundation.

Clonal propagation is a method of multiplying rice plants from a single grain has several advantages over the conventional seed-crop multiplication: - applicable to any rice cultivar ensures genetic purity of multiplied material, - could be easily adopted by farmers, - except for labor, the system entails minimum costs to farmers.

For rapidly spreading improved upgraded varieties and for exploiting their hybrid vigor, clonal propagation technique can give very good results. It was demonstrated that the healthy seeds, obtained by clonal propagation for a full crop of rice to follow, give nearly 20% higher production for any rice variety. Clonal propagation in rice as a mean of raising pure seeds offer 20 per cent higher production and the extension of this technology to exploit hybrid vigor to obtain 50 per cent increased yields, remain unexploited, a great discovery of immense value is left unheeded. In large parts of the country, the rice crop is ruined either by drought or flood conditions and this invaluable technique helps raise and increase the seeds and their resistance to floods as well as drought conditions, not to mention disease and pest invasions.

'If we were to think of a single characteristic of the rice plant which yields food for millions, it cannot be anything else but its variability in the form of thousands of its cultivars, spread in India and in other rice growing belts of the world. This is because of the rice plants flexible genetic make-up and mutational power of adaptation.'" Dr. R H Richharia.

### **SESSION - 3**

#### **ALANGUDI PERUMAL PADDY TRASPLANTATION METHOD**

##### **- Sriram, Save Our Rice Campaign, Tamil Nadu**

The method was developed by Alangudi Perumal – a small farmer from Nagapattinam, Tamil Nadu accidentally when his rice crop was destroyed due to floods in 1999. Due to lack of time and money, he decided to use the remaining seedlings to plant his land by doubling the space which gave a good result. Good yield by using fewer paddy seedlings had prompted him to test further in subsequent years. He again experimented by reducing seed quantity of seed and increase the gap between seedlings during the next season, ¼ Kg of seed and 50cm by 50cm spacing for each plant was used and again the yield was very good an acre, usually yields him around 4 ton per acre.

A Team from Auduthurai Rice Research Institute, and Tamilnadu Agriculture department monitored entire process and measured paddy yield for documentation purpose and approved the method in the consecutive seasons. This method is tried out by many farmers, in different regions with different varieties.

This innovation that has 6 core principles, the objective being to enhance rice production using less quantity of seeds.

- Selection of quality seeds
- Preparation of nursery and seed bed
- Maintenance of nursery and seed bed
- Square planting of seedlings at the distance of 50cm x 50 cm
- Crop management

Seed Selection – Quality Aspect – always prefer own seeds, which have to be fully matured – identified and collected, only pure line selection, then the seeds are cleaned and same size have to be selected, then dried and stored.

For good seed selection the best plant has to be selected that has maximum tillers, free from pest and disease. The plant has panicles that have maximum grains.

Nursery Bed Preparation is most essential - 3 cents of nursery for 1 acre, prepare nursery with Green manure and Compost, Prepare Weed free Bed. Treat the seeds with panchagavya or beejamirtha, broadcasted in 3 cents of seed bed. The nursery bed is just to be wet every 5 days. Plant boosters are used on 7th & 12th day.

Seed Sowing – 1/4kg of fine variety or 1/2kg bold variety seeds for an acre of land.

Transplantation in 15 to 20 days at 50 x 50 cm. The plants show 80 tillers in 45 days & 60-70 productive tillers in 60 to 70 days on an average to a high of 120 tillers. There are no lodging and yields of 9.88 MT/ha are common with native varieties under organic inputs.

Main Land Preparation – Mark in a rope for every 50cm and a square is made in the main land and the seedling is transplanted with a spacing of 50 cm between each seedling. Only the root is plugged and not the plant. Use only Green Compost manure before ploughing. Wooden planks are used for fine leveling and once the land is leveled, we should not walk.

Advantages of this method- ■Pesticides attack would be minimum due to space allotment ■ Requirement of water is minimum ■ Weeding is so easy because of length in space ■ 120 tillers would be there on an average during Harvest ■ Lodging will be minimal because of more of tillers ■ Rat damage would be minimal ■ more air circulation, nutrition & Sun light to the crop will lead to lesser height of the crop

#### **SESSION - 4**

#### **DIRECT SEEDING OF RICE - ORGANIC RICE – GOK (Govt. of Karnataka) INTERVENTIONS, A RETROSPECT**

- **Dr. R G Gollar, Retired Joint Director of Agriculture, Govt. Of Karnataka**

Dr. Gollar shared about the Direct Seeding Rice method usually practiced for rain-fed and deepwater ecosystems. Farmers sow onto dry soil surface, then incorporate the seed by plowing. This method is usually practiced in rainfed and deepwater ecosystems. Direct sowing is done they don't use seed drill. This is an age-old practice in Western Ghats in Karnataka and followed in districts of Dharwad, Belgaum, North Karnataka and some parts of Shimoga.

Direct seeded rice crops require less labor and tend to mature faster than transplanted crops. Now many farmers use 9 to 11 kgs of seed is sown using mechanically operated drawn seed drills.

He began his presentation with an introduction to the 10 agro-climatic zones of Karnataka- North Eastern Transition Zone, North Eastern Dry Zone, Northern Dry Zone, Central Dry Zone, Eastern Dry Zone, Southern Dry Zone, Southern Transition Zone, Northern Transition Zone, Hill Zone and Coastal Zone. It is a state with many worlds. Started work in rainfed rice area but it was not organic practices and in 1996 it changed my way of life by meeting stalwarts like late Sri.Purushothama Rao of Kuruvalli in Thirthahalli taluk a pioneer in organic farming, popularly known as well-known as 'Krishirishi'. Then we started with providing small incentives and vermicomposting was undertaken by women. The Green manuring was introduced and it was made crop specific. Rice growers were encouraged to adopt as most of the benefits at that time was availed by areca growers. Incorporation of green manuring was a boon to organic



cultivation of crops. Dhaincha was introduced to rice lands, as it sustains higher moisture and use of bio/dung slurry.

Organic Rice Cultivation in different ways – weed management is made easy by planting seedlings or direct seeds in rows, either by use of rice transplanters or direct seeding with seed drill. Weeding is either mechanically done or by cultural operations with seed drill.

Experiment at the Research Center- the experiment was integrating all the three- Green Manuring, Vermicompost and Bio slurry for the rice management which led to a good yield of 30+bags of paddy yield in the first attempt itself, as against 13-14 bags with single approach of either Green Manure or Vermicompost or Bio Slurry and 8 seasons and reached 22 bags yield level.

## **DAY 5**

YouTube link for Webinar 5 -[https://www.youtube.com/watch?v=\\_phzfyuZsg0](https://www.youtube.com/watch?v=_phzfyuZsg0)

### **SESSION – 1**

#### **RICE CULTURE & RICE CUISINE**

- **Seema Prasad, Coordinator, Save our Rice Campaign, Karnataka**

Rice is the staple food for nearly half of the world population. It is the most consumed grain and we had nearly more than one lakh varieties of rice. Rice is food and also medicine. Rice is the first food for new born babies and also last for dead bodies.

Rice Gods and Goddesses - Rice is involved in the culture as well as the food ways of many countries. Rice is an integral part of many cultures. Growing rice tends to foster cultures and interconnectedness of many communities. It is the leading crop and most preferred food. Rice, a perfect and complete food offering, it is an offering to gods. Rice is placed in a bowl in Buddhist shrines. In some traditions, rice is used as an offering even in the south Asian countries. The goddess is dressed in paddy ear heads and straw and is prayed. In Indonesia the deity called Dewi Nawang is credited with teaching people how to cook rice. They have a festival 'Devi Sri Matha' and every house there has a tradition of making goddess in paddy straw and then the goddess is taken on a procession.

In Philippines on the 15<sup>th</sup> of May in a town of Lucban there is a celebration as farmers thank giving for a bountiful harvest with a grand display of KIPING, it's a colorful rice wafer. In Japan there is a Rice Planting Festival it is believed that dancing and music enhances the vitality of the rice grains and prayers for a rich rice harvest is held. Wara Art Festival - the festival showcases sculptures made from rice straw with students from a Tokyo university in collaboration with local farmers.

Thailand is rich in its rice culture, they use paddy ear heads, paddy straw to decorate their houses and other places. The festoons are so creatively done.

Rice paddy art is an art form originating in Japan where people plant rice of various types and colors to create images on a paddy field. Now they have become tourist spots. This is one way of encouraging tourism.

We also created Paddy Field art in Karnataka and were able to create art and our farmer from Davangere took to designing art on his field with two varieties – a mother and baby playing. Similar Paddy art was

created in Maharashtra by an engineer, a 40-meter-long Ganesh was designed on a paddy canvas. There are many artists who have created many unique designs, Hanif Mohammed writes on rice grains.

Karnataka is rich in Rice diversity and is known to have more than 20,000 rice varieties. During the Seed mapping that was undertaken we were able to identify only 360 rice varieties of our state, of which 127 were rare and 96 varieties were available and almost 137 varieties were extinct.

In Save our Rice Campaign we were able to work with School Children by building in awareness to these children. Rice is an intercrop – so we have been able to revive the rice and its intercropping with other crops and also fish and duck farming along with rice.

We have unusual varieties of rice – deep water varieties are tolerant to floods and they stand erect even after the flood recedes after 45 days. Aghanashini is a small village situated on the southern banks of River Aghanashini in the state of Karnataka, a unique rice variety grows in the deep brackish water '*Kagga*'. This unique saltwater-tolerant rice variety is pest-free and resilient to environment stress. Around 2000 farmers are into rice multiplication and conservation.

Rice should not be addressed as one, as rice has many varieties – Medicinal rice – *Navara*, *Mapille samba*. Pregnant rice – *Kari kalave*, Joint pain Rice – *Navara*, Rice to cure Herpes – *Karibatha*, Rice for strengthen and vigor – *Mapille* (means Bridegroom) *Samba*, and Rice for the Diabetic – *Pedda baira vadlu* and *Kari jaddu*.

## **SESSION -2**

### **RED RICE – UNKNOWN TREASURES**

#### **SHAALI IN AYURVEDA**

- **Dr.Sathyanarayana Bhat, Ayurveda Consultant**

Dr. Bhat showed us the Archaeological evidence of rice cultivation in India and the medicinal importance of this grain.

Rice in Charaka Samhiti is mentioned that there were 15 different types – *Raktha* -, *Maha*, *Kalama*, *Shakunahritha*, *Turnaka*, *DeerghaShuka*, *Gowra*, *Panduka*, *Langulaka*, *Sugandhaka*, *Lohavala*, *Sarivaka*, *Pramodaka*, *Pathanga* and *Tapaneeya*.

Sushruta Samhitha has quoted 19 different varieties of rice. *Lohitha* is Red rice, *Kalama*, *sugandhaka* is fragrant rice, *Mahashali* is a long-grained rice, *Mahisha* meaning wetland variety.

Qualities of Rice which is Pathya – Rice is sweet – *Madhura*, Rice for body cooling – *Sheetha*, best to bind body tissues – *Snigha*, *Laghu* – is good for digestion, *Balavaha* – strengthens the body mass, Alleviates Pitta – liver protective. Special qualities of Red rices- are they are the best among all types of rice, improves voice, good for eyesight, good for heart, improves quality of semen and urination, improves color, complexion and body strength, alleviates tridosha, thirst, fever and body toxin.

Seasonal Cultivation of Rice in post vedic era – *Hemantha Shali* meaning winter rice, *Greehna Shali* is Monsoon season rice, *Shashtika Shali* is rice grown in 60days.

## **SESSION – 3**

### **COOKING WITH RED RICE**

- **Shirkripa, Blogger**

Shrikripa started with introducing the unpolished and polished rice. Unpolished red rice retains the bran and is rough and the polished rice is stripped of all nutrients and is white in color without bran. Unpolished has low shelf life and a bit chewy, but is packed with nutrition.

Parboiled rice is also called easy-cook rice. Paddy is partially boiled with the husk. The 3 steps involved are soaking, steaming and drying which makes the rice parboiled.

Cooking parboiled rice - Cooking parboiled rice is easy, and is basically the same as preparing ordinary rice. Boil 2 parts water and a pinch of salt, add 1-part rice, then cover the pot and reduce the heat. While parboiled rice is a distinct type of rice, the term could also refer to partially cooking white or brown rice.

Cooking in a Chinese pot – add washed rice to boiling water. After oiling it for another to 10 mins place it in the china pot and after an hour it will be almost done. Once perfectly cooked, strain and use rice with any curry or have it in ganji form. Different dishes with par boiled rice – Semige or Shyavige – this is a steamed breakfast or also can have as a snack. Pundi-is another delicacy of coastal region. It is made of rice flour and coconut and cooked and then made into small balls and steamed again. Brown rice-Horse gram laddu. Parboil rice cuisine – Ganji or gruel.

## **EATING OUR WAY INTO RICE DIVERSITY**

- **Sreedevi, Founder Bio Basics and Consultant**

Sreedevi shared her creations of using desi rice to appeal to the younger generation and keeping in line with people's food interests. Using desi rice in the contemporary, urban context and keeping in line with people's food interests. On the palate, there was uniquely nutty, flavorful, scented, steamed rice that was served it complemented and enhanced the flavor of the food and so creatively plated rice

Traditional red rice meal for everyday with a modern touch and effort has been constantly in educating people that desi red rice can be cooked in the contemporary style where the younger generation too start to eat these rices.

How to feature desi rice in the modern context, so we came up with rice for every season and the Summer with Scented rice. So, some delights were tried out – *Gandhasale* Ashgourd curd rice, *Javaphul* Pineapple Rice, *Jeeraga Samba* Coriander Rice, *Indrayini* Mango Rice, Jasmine Rice with Veggies, *Mullankaima Kheer*. Scented rice is light and fragrant and children will love it. Kanji's for the Monsoon – with a sticky rice from Tamil nadu.

Breakfast, Lunch and Dinner with flattened rice and puffed rice-it is a mix of red flattened rice, white flattened rice into a Mueslis and *Gandhasaale* Ven Pongal. We have to truly adopt eating the desi rice varieties, if only we urbanites start eating will the farmers grow. It is very important to eat diversity to conserve biodiversity. That's how we connect to farmers and biodiversity. Biodiversity depends on the implementation in terms of safeguarding the ecological balance, including protecting region as a heritage and we protect agro-biodiversity by beginning to eat these varieties.

Puttu with *Mappilai Samba* flour. Idli with *Pomani* red rice. *Kullakar* Risotto- risotto is slow cooked to retain its flavor and this variety is good for it. These different dishes were created with using traditional rice varieties to create consumer awareness, which is an important factor to increase the demand for our rice varieties. For instance, if chefs and food writers try to focus on bringing back on to plate not-so-popular rice varieties it would revive our rice varieties and farmers who are small in number will grow these varieties.

there will be increased demand based on the unique quality of the rice, which could lead to farmers producing these varieties again and, thereby, check the trend of landraces from getting extinct.

## DAY 6

YouTube link for Webinar 6 - <https://www.youtube.com/watch?v=zbFz-hJ-s14>

### SESSION – 1

#### TRADITIONAL RICE PROCESSING CHALLENGES

- **Shri.Gauthaman L.K, Proprietor, Varaprasadam Organic Mart, Nagercoil**

Gowthaman explained that they were a family of Rice Millers and Traders, and have been in this business from 80 years. My grandmother Thayamma used to Hand Pound – famously known as *Kaikuthal arisi*. The rice is Handpounded using Mortar and Pestle, pounding the paddy a force used on grain against grain that removes the husk and bran layers. The pounding also breaks up fissured grain. The final cleaning is by winnowing in a woven bamboo tray. The winnowing process to separate unmilled paddy grain is an art and this process my grandmother practiced in our ancestral home.

Then the process mill was started by my grandmother and then passed on to her son and now we are the 3<sup>rd</sup> generation processors.

At any given point our mill has always stocked 30 or more traditional rice varieties. We are a popular traditional rice processor.

Traditional Rice Varieties - *Poonkar, Pullankadu, Thooyamalli, Kavuli, Thengapoo samba, Garudan samba, Kaattuyanam, Varappu kudainjan, Matta kaar, Kalan namakku, Kaala namak, Kottara samba.*

Medicinal rice and their values- *Mappillai samba* -controls sugar levels, improves digestion, cures mouth ulcers, *Kavuni*- rich in anti-oxidant), *Poongar*-ideal for pregnant women, *Palkudavalai*-good for heart patients, *Elupaipu samba* - gruel apparently rejuvenates even bed-ridden patients, *Thooyamalli*-Increases nerves strength, *Kullakkar* -Revitalises and energises the body, lowers bad cholesterol, red rice varieties have antioxidant properties and higher zinc and iron content than white rice. *Pullangadu*: Good for diabetes and for those who suffered paralytic attacks, *Kalunkuruvai*- Used to treat people suffering from Elephantiasis, *Poonkar*- Gives strength, *Kattuyaanam*-Helps control diabetes, *Kavuni rice*- this is an ancient rice and is in existence from the Chola period. Good for lactating mothers, there is also a black *kavuni* rice is used to treat dog bites.

Grain Structure -Rice grain is made up of two layer - husk, inner layer and the bran. When the husk is removed, the rice is called brown rice or unpolished rice, it will have the bran layer and removal of the bran layer is termed as milling degree to produce white rice or the polished rice. The extent of removal of bran is according to the preference of the consumer.

There are three types of processing now with the machines - The husk and the bran are removed in one pass and white rice is produced directly from the paddy. Second step - The husk and the bran are removed separately, and brown rice is produced as an intermediate product. Third step - Paddy passes through a number of different operations and machines to obtain white rice.

The steps involved in the conversion of paddy to rice by the machines with modern techniques and the by-products obtained during processing of paddy – Paddy is procured directly from the farmers. The procured paddy is checked for its moisture content at the time of the arrival in the unit.

Paddy is run through the pre-cleaning process that removes impurities and unfilled grains

Husking - husk was removed from the paddy a husk is separated from the brown rice or unhusked paddy

Paddy Separation – the unhusked paddy is separated from the rice

De-stoning – Small stones from the brown rice is separated

Whitening – the bran layer and germ is removed from the brown rice

Polishing – improve the appearance of milled rice by removing remaining bran particles and then polishing the exterior kernel to produce polished rice

Sifting – this process separates small impurities from the milled rice

Grading – the rice is separated into small, large rice, also the broken head rice and this is broken rice

Weighing and bagging – good quality rice, without the broken heads is packed for the customers.

Then the process of the raw rice, steam rice, single boiled and double boiled rice is the done.

The head rice was the economic output and husk, chaff, bran and brokens were obtained as by-products when the paddy was processed. The husk was utilized as energy source for the boiler and rice husk ash was obtained from the process. The husk is also used to produce rice bran oil.

Now modern Machines comes with complete process of milling – Sorter – De-stoner- Rubber Sheller designed to remove husk from all kinds of paddy. These machines perform - Rice Cleaning, Parboiling and Drying, Milling & Grading all at one go.

The Parboil Rice - The raw rice is red rice that is processed as boiled rice. The par boiling process is done before husking. After boiling, the grain is separated from husk, there by leaving a part of the bran on the grain that leaves a brownish tinge on the grain. This process helps retain many of the vitamins found in unprocessed rice. Nutrients soak into the rice kernels before the outer layers are removed.

Diana rice or Diabetic Rice - is the by-product of our processing unit. Dianna rice is a red rice variety that has been processed from the original rice variety called *Karuvai kalanji*, a native rice variety of Tamil nadu. It is low glycemic index rice, a parboiled red rice, specially created for diabetes patients with lower content of carbohydrates. It is partially boiled with the husk and it has 80% of nutrients of the red rice, making an ideal food for Diabetic and Diet conscious people. The sugars are low in this food and is released slowly in to the blood stream, causing blood glucose levels to rise and then fall more slowly than the foods which have a higher Glycemic index (GI). Doctors encourage diabetic patients to eat food that does not produce sharp rise in blood sugar.

Unlike refined white rice, there is a par boiled red rice retains the vitamin E rich oil between the bran and endosperm. Because of the bran's high fibre content, Diana rice has a rough, nutty texture.

## **SESSION – 2**

### **BUILDING ORGANIC RICE GROWERS COLLECTIVE & PROCESSING TRADITIONAL RICE**

- **Shri. Rajesh Krishnan Thirunelly Agri producer Company Ltd (TAPCo) Wayanad, Kerala**

There has to be a massive shift in terms of our food habits, policies and a larger social outlook. Especially when we talk about bringing back that our current system that does not encourage.

Wayanad – wail is paddy lands but overtime thanks to our present system. The challenge we had was to see if Rice cultivation can be retained and second was to see if farmers will shift back to Rice cultivation giving up banana, ginger and 3<sup>rd</sup> challenge was will farmers revert back to cultivating traditional varieties.

This was the idea that TAPCo, came into existence mainly to protect the paddy farmers in Wayanad. The farmers here were denied a fair price for the rice produce and this led to paddy cultivation as a loss-making occupation and farmers shifted to more promising crops and the vast paddy lands were declining. The whole district of Wayanad has seen a reduction in paddy cultivation and Thirunelly Panchayath, where we work, has seen paddy cultivation reduce to about 1/3rd in the last 10 years.

This start up that believes in – Ecological Sustainability, - Social Justice and Economic Viability. Thirunelly Agri Producer Company Limited (TAPCo), was started in 2017, as a Farmer Producer Organization (FPO) with initial support of NABARD and hand holding by Thanal. The FPO started with 10 farmers, now works with 85 farmers over a collective paddy landholding of about 193 acres. At TAPCo, we operate with the belief that farming and agriculture – when done with traditional varieties, it is about seed sovereignty and conserving the local gene pool. – when done using organic practices, it is about securing our soil and water and everything that lives off it, - when done with local farm help, it is about creating hinterlands jobs and powering local economy, - when done with equity, it is about ensuring fair price to the farmer community, - when done along with the establishment, it is about strengthening local self-governance, - when done collectively, it is a social celebration and a political action.

We started with 10 acres of traditional varieties and the challenge of marketing came up and we were able to market the complete produce with THANALS weekly organic markets.

How do we do that? – Seed – baseline survey of traditional varieties and also identified farmers who were already cultivating these varieties and three things that came up were Seeds, Crop Management and Markets and these were that we have to work on. In the 1<sup>st</sup> year 2016-17 14 farmers came together. The first year of hand holding is a closely monitored process with a field officer. Addressing pest attacks with organic pesticides/practices, advising on crop rotation the paddy crop at the end of the season with legumes for soil rejuvenation and Facilitating the organic certification process.

Then providing quality seeds of traditional varieties to farmers, initially two years we provided 5 tons of seeds to the farmers not only from the collective but we reached out to others also. We already had pulankotti a traditional red rice variety, yields around 2to2.5tons and a good performing variety. Other varieties that our farmers started cultivating were – Wayanadan Thondi, Paal Thondi, Chethadi, Gandhakashala, Jeerakashala, Mullankaima, Valiachennellu, Njavara. Bring back the traditional knowledge associated with cultivation of these varieties was important.

Then Markets were still an issue so we worked on the procurement side - Procurement is our gold standard

Standard, procures at a predetermined price, that is the farmer fixes the price, which farmers know of an assured uptake at the start of season, and we procure at farm gate with an immediate cheque at a price that is substantially higher than the state MSP and the local market prices for paddy.

These prices are arrived at by calculating the cost of cultivation and yield for each variety for the season. That directly offloads a farmer's very real end-of-season worries of storage, transport, and returns on the crop.

Over the years our annual turnover is 2017-18 was around Rs. 3lakhs and today our turnover is more than Rs.65lakhs, 2020-2021 is the most challenging year. The rice movement has been impacted with sales.

Beneficiary Farmers – we have seen a growth with respect to increase in farmers being members of the collective and an increase in area of cultivation of traditional varieties – 2-17-18 we were about 16 farmers cultivating in an area of 42 acres and now 2020-21 we are around 89 farmers cultivating in 197 acres.

What we have achieved is providing Fair price to the farmers, Conservation and expansion of traditional farmer saved seeds, Expansion of area under organic cultivation, Safe food at reliable qualities and affordable prices and Consistent stocks round the year.

Strength of the FPO has been – Strong Principles and Values, Visionary committed Director Board, Small yet efficient team of Employees, Farmers who want farming to sustain- one farmer has been awarded for his efforts and has been conserving 26 varieties, Consumers who want safe food - We are conserving our diverse paddy ecosystem, and preserving traditional paddy varieties; is because of a growing tribe of sensitive consumers who seek products that uphold sustainability values and Support from NABARD and agriculture Department. And TAPCo. is so very proud to be part of this huge drive.

### SESSION - 3

#### TRADITIONAL RICE VARIETIES: AN OVERVIEW OF CIKS EFFORTS

##### - A V Balasubramanian, Trustee, Centre for Indian Knowledge Systems (CIKS), Chennai

CIKS last 25 years their efforts relating to agro-biodiversity conservation and utilization has progressed extensively as well as deeply into traditional seed production, create market linkages to farmers growing traditional rice varieties. On-farm conservation has resulted in 140 varieties of traditional rice being conserved in different locations. Extensively documented and characterized the agronomic properties of traditional rice varieties – these rice varieties are nutritionally rich when compared to the modern varieties. Standardized methods for organic crop production and have built capacities of farmers through trainings. Standardized methods for seed production and built capacities of farmers. Initiated studies on nutritional and therapeutic properties and Scaled up the production of specific varieties and helped to create market linkages for the same.

Diversity of Rice in the Indian situation – according to Dr. Richharia, Director of the Central Rice Research Institute at Cuttack, he estimated that during the Vedic period as many as 400,000 rice varieties existed in India. Even during the 1980s he estimated that 200,000 rice varieties were still in existence. In fact, during his life time as he had personally collected as many as 20,000 rice varieties in Madhya Pradesh and now they have further decreased to about 1lakh varieties being conserved in small holdings all over India.

Study of Agronomic Properties – Paddy varieties resistant to flooding in Tamilnadu

*Koomvazhai* and *Samba Mosanam*. Varieties that can be cultivated in clayey soil – *Kaliyan samba*, *Samba mosanam*, varieties that can be cultivated in sandy soil – *Kitchili samba*, *Kullakar*, Varieties having resistance to pests and diseases - Varieties resistant to brown plant hopper is *Sivappu Kuruvikkar* and paddy ear head bug – *Neelam samba*, varieties resistant to many pests and diseases – *Kudhiraival samba*, *Kurangu samba*.

During the tsunami disaster in the year 2004, thousands of hectares of land under paddy in the coastal regions of Nagapattinam district were immersed under sea water for various periods. However, we found that one indigenous paddy variety in our collection called *Kalarpalai* which was traditionally considered suitable for growth in saline soils could grow and provide reasonable yields in tsunami affected lands. Similarly, we also found that an indigenous paddy variety from the Gorakhpur region of Uttar Pradesh called as *Kalanamak* which was traditionally considered suitable for growth and saline soils could also

grow well in this region. Thus, we found that these varieties were extremely important in the process of management and recovery after disaster.

Paddy Variety for every dish – Currently the consumers are only familiar with a few widely prevalent rice varieties in the market and are not aware of how to cook desi rice varieties. There is a need to test and standardize information relating to the cooking qualities. Does the rice need to be soaked / pre-soaked before cooking? What is the suggested ratio of rice and water? What is the procedure to be used if the rice is cooked in a pressure cooker? We have to suggest the time for which it has to be cooked either in minutes or the number of whistles? What is the texture of the rice that is cooked? What does the rice pair with in terms of dishes that are popular in a particular region?

#### Nutrient Content of Organically grown Indigenous Rice Varieties

| Sl. No. | Nutrients    | Units     | White Ponni | Karun gguruvai | Mappilai Samba | Kudai-vazhai | Kala-namak | Perungkar | Kudai-vazhai | Kavuni | Kullakar | Neelan Samba |
|---------|--------------|-----------|-------------|----------------|----------------|--------------|------------|-----------|--------------|--------|----------|--------------|
|         | Energy       | Kcal/100g | 351.32      | 358.56         | 358.52         | 358.94       | 356.68     | 357.54    | 357.36       | 354.48 | 355.92   | 355.14       |
| 2.      | Carbohydrate | g/100g    | 77.85       | 77.85          | 80.28          | 79.7         | 78.53      | 76.88     | 77.67        | 78.33  | 78.04    | 78.54        |
| 3.      | Protein      | g/100g    | 9.06        | 9.45           | 7.18           | 7.92         | 8.93       | 9.58      | 8.97         | 8.49   | 9.32     | 8.58         |
| 4.      | Fat          | g/100g    | 0.92        | 1.04           | 1.0            | 0.94         | 0.76       | 1.3       | 1.2          | 0.8    | 0.72     | 0.74         |
| 5.      | Crude fibre  | g/100g    | 1.48        | 1.49           | 7.07           | 1.16         | 1.42       | 1.4       | 1.19         | 1.48   | 1.37     | 1.08         |
| 6.      | Calcium      | mg/100g   | 80.63       | 77.09          | 50.82          | 54           | 63.55      | 57.14     | 52.7         | 78.8   | 52.54    | 80.48        |
| 7.      | Iron         | mg/100g   | 4.25        | 19.63          | 5.47           | 6.13         | 3.84       | 7.64      | 4.23         | 4.51   | 5.62     | 5.75         |
| 8.      | Potassium    | mg/100g   | 94.23       | 83.85          | 90.39          | 80.17        | 98.82      | 93.98     | 81.6         | 88.78  | 88.77    | 93.23        |
| 9.      | Phosphorus   | mg/100g   | 264.04      | 350.59         | 310.92         | 274.73       | 318.10     | 264.77    | 256.3        | 253.49 | 303.03   | 235.05       |

#### THE NAMMA NELLU PROGRAMME: CONSERVATION AND THE SCALING UP OF CULTIVATION

Namma Nellu (a Tamil term meaning – “Our Rice”) is an initiative of CIKS crowd funding to conserve Indigenous rice varieties. Though CIKS has been involved in the conservation of rice varieties since 1995 the upscaling efforts started in the year 2016 when Namma Nellu was launched. This initiative has progressed very well.

- We have been able to conserve the germ plasm of 140 varieties and provide seeds to more than 2000 farmers across the State of Tamil Nadu.
- Systematic scientific documentation of these varieties has also been done for all these varieties.
- A dedicated website ([www.nammanellu.com](http://www.nammanellu.com)) has been created and provides information to the consumers and also creating awareness to the general public.
- We have produced four short films including a 2020 film entitled - "Myriad hues of Rice"

Marketing - Namma Nellu has developed partnership with companies for marketing efforts.

- Sempulam Sustainable Solutions, has developed a brand, come up with professional packaging and presentation to make it attractive and to raise awareness.
- The products are also on sale in platforms like Amazon and Flipkart vastly increasing their visibility and reach.



Packaging, Branding & Retail Marketing With an aim to create an awareness amongst consumers regarding the traditional rice varieties which will lead to the large-scale consumption it was decided to launch a gift hamper for the festival season.

- The rice varieties were vacuum packed and have a shelf life of a year.
- The gift box had six rice varieties.
- The box includes a listing of the varieties and suggestions about cooking (water required, cooking time and its suitability for various specific dishes).
- The box includes a greeting card from the farming community and a brochure about the Namma Nellu programme with art work specifically designed for the box.
- The rice varieties could also be purchased as individual mini boxes and customized boxes with 3, 4 and 5 varieties can also be made upon special request.

#### Attitude & Approach

- Sustainable agriculture approach respects and rebuilds the relationship between the humans and the eco system and life forms
- We emphasize on local production, processing, consumption and increased self-reliance.
- We aim for progress that is gradual and assured, minimizes risks and does not promise miracles or dramatic/immediate results
- It seeks to build on traditional knowledge and resources in the broader sense leading to the empowerment of the local communities.

## DAY 7

YouTube link for Webinar 7- [https://www.youtube.com/watch?v=E6eXMF\\_38Yk](https://www.youtube.com/watch?v=E6eXMF_38Yk)

## SESSION – 1

### GENETICS OF TRADITIONAL RICE

- **Dr. Raghu, Food & Nutrition Expert, Founder Pristine Organics**

As science advances we understand nothing works in Silos. WWW means world wide web there is another Wood Wide Web, a network of microbes that connects trees, individual plants are joined to one another by an underground hyphal network: a dazzlingly complex and collaborative structure that has become known as the Wood Wide Web.

The relationship between these mycorrhizal fungi and the plants they connect is now known to be ancient (around four hundred and fifty million years old) a large symbiosis which both organisms benefit from their association. It is a large network and nature does not work in Silos. Much larger network than 5g.

There is so much ignorance and lack of knowledge of nature and genetics and epigenetic. Post Corona - COVID-19 pandemic we have realized that all is interconnected, not that we did not know but were ignorant. One Health is a well-recognized concept; but less know to public. One Health approach in the current health care system that WHO talks about

One Health' is an approach designed as human health is interconnected with animals, microbes, to inorganic system, to universe- and implementing programs, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes.

If we have more carbon-dioxide in air then we will have sugary plants. And since human activity is raising atmospheric carbon dioxide levels, thick-leafed plants appear to be in our future. Diabetics in the air, carbon-dioxide is connected to our carbs in our food.

Gene expression and Gene suppression - Gene expression is the process the cell uses to produce the molecule it needs by reading the genetic code written in the DNA. To do this, the cell interprets the genetic code, and for each group of three letters it adds one of the 20 different amino acids that are the basic units needed to build proteins.

The loss and degradation of natural habitats are key to emerging infectious diseases from wildlife. When an area of land is deforested and converted or used for infrastructure development, it reduces the natural habitat available to species and can bring them into more regular contact with each other as well as humans. This gives microbes a greater ability to move between species to species.

While this relationship is complex and context-dependent, the general trend is that habitat loss increases the likelihood that species carrying potential viruses are in close proximity to people.

Suppressing the effects of a mutant gene by changes elsewhere in the genome can occur in a number of ways. Gene when exposed to one certain substance then they react like for e.g. If sugar is fed to bees then it is gene plasticity that is the ability of an organism to change in response to stimuli or inputs from the environment. Diet-dependent gene expression in honey bees, the natural ecosystem is disrupted. Expression and epigenetics are the most studied subject.

Brown mice study – the professor said that if the natural environment is given to the mice then they generations of yellow fat mice became lean brown mice.

There is interconnectedness in nature, they say that we are what our grandmothers and father ate. Because epigenetic traits are inherent it is internal environment and external environment gets internalized.

The existence of interconnectedness explains why when changes are made in one part of the ecosystem, other components are affected, often in unexpected ways.

We are putting all genetics in one basket. Don't put all your eggs in one basket – this means that one should not concentrate all efforts and resources in one area as one could lose everything.

Nature' is at the very core of science, considered as its flagship and deepest link with human societies. However, while nature preservation has become a major social concern, the idea of nature remains elusive.

## **SESSION - 2**

### **ETHNO - SCIENTIFIC APPROACH FOR EVIDENCE BASED PROMOTION OF INDIGENOUS PADDY VARIETIES OF TAMIL NADU –MORPHO-NUTRITIONAL ANALYSIS**

- **Dr. A. Sathya, Senior Assistant Professor, SASTRA University, Tamil Nadu**

We should reach the table of the consumers from the farmers this has been my approach. We started with an ethno-scientific survey of indigenous rice varieties. We had streamed lined Agronomic, Physiochemical

and Characterization and we are still at the second stage and then we go on to genomics and metabolomics.

The 20 varieties chosen for the study – Varieties – *Arubadam Kuruvai, Poonkar, Sandikar, Kullakar, Salem Sanna, Iluppaipoo Samba, Seeraga Samba, Karunkuruvai, Kaala Namak, Basmati, Muttrina Sannam, Mysore Malli, Thuyyamalli, Athur Kichilli Samba, Thanga Samba, Karuppu Kouni, Kaivarai Samba, Mapillai Samba, Kattuyaanam, Garudan Samba* most Tami nadu varieties.

After the first-year trail we gave the seeds back to the farmers of CREATE and Saver our Rice Campaign. This was linked to the community seed banks and farmers procured seeds for the next stage of trails.

The objective was - To Survey the ethnos –scientific knowledge of the Heritage rice varieties for therapeutic applications.

The Ethno-survey of farming practitioners was the number of respondents – 175 farmers initially and now we are increased to 360 farmers, most farmers are aware of the medicinal properties of the rices.

Field evaluation studies

Field trials were implemented at 3 sites in Kuruvadipatti Village, Thanjavur. The practices followed were all organic in the 3 sites. -Goat manure + Cow Urine mixed and spayed @ 20%, 20 days after transplantation, SRI (System of Rice Intensification) method was adopted for transplantation. Silver Shoot was observed but left without treatment due to inbuilt immunity of traditional paddy varieties.

Regular monitoring at Vegetative stage, the organic pesticide spraying for plant protection, agronomic observation, post transplantation, then we did agronomic characterization of all the varieties – parameters were Time of heading, No. of Productive Tillers, Time of Maturity, Height of the plant and Yield, leaf width, stem thickness and so on.

The yield parameter exhibited: Average yield of Rice in India is 2-3t/ha

The overall yield of all 20 varieties in 2020 except Karupukouni were less than 2019 due to unprecedented rainfall for about 100 days during flowering to harvest stages leading to lodging. But in spite of it, the yield was comparable to Indian average yield of 2-3 t/ha in late maturing varieties starting from Basmati to Garudan samba.

Amylose Content - High Amylose: in Poonkar, Kaivarai Samba, Garudan Samba, Thanga Samba and intermediate amylose content: Iluppaipoo Samba, Seeraga samba, Kullakar etc., and none of the varieties were low in amylose.

Root Characteristics: The length of the root and root diameter influences biological and economical yield than the root density as the lengthy roots are capable to uptake high amount of nutrients than shorter roots. the varieties exhibited good root growth – *Kattuyaanam- Dense with fine hair, Iluppaipoo Samba-Dense, - Arubadam Kuruvai - Less Dense*

Cooking characteristics - Consumers are heterogeneous with respect to their perceived differentiation of rice quality among regions, countries, cities & urbanisation levels. - Premium quality is defined by nutritional benefits, softness, and aroma in South east Asia- Physical appearance of the grain, uniformity, whiteness, slenderness and aroma in South Asia- The varieties- Basmati, Iluppaipoo samba, Karunkuruvai, Karupukouni have ER Slender.

Major Mineral Analysis - Iron rich varieties identified were Iluppaipoo samba & Karunkuruvai among the screened 7 varieties. P,K,Mg were identified to be rich in varieties such as Iluppaipoo samba, Karunkuruvai, Karupukouni and Basmati.

The morphological characteristics have been identified and reported in the form as prescribed in the guidelines published by the Government of India under the Protection of Plant Varieties and Farmers' Rights guidelines for rice- *Oryza sativa* (PPVFRA, 2007). These guidelines are applicable to all varieties (both hybrids and indigenous), parental lines of rice. About 82 parameters have been recorded for these threatened indigenous varieties. The coding system for characterization has been followed as prescribed in the guidelines.

New Observations - Vegetative phase Morphological coding for characterization - Totally 82 characters have been observed among 20 varieties in all the plots by choosing plants at random with minimum 3 replicates to maximum 10 replicates. Out of all the characters observed, presence of Anthocyanin in stem, leaves, grains and in stigma & ligules in Karunkuruvai is unique as it is matching with the universal claim on this variety as therapeutically significant against many diseases including diabetes.

Concluding - In spite of Covid19 outbreak, the project is steadily progressing with the support of local farmers and host institution with minimum man power. Moreover, there was unprecedented rainfall continuously for more than 100 days from November 2020 to 3rd week of January 2021. In spite of it, 11 varieties out of 20 varieties have given optimum yield of 3-4 t/ha, even in the face of extreme climate challenges compared to 2-3t/ha which is Indian average rice yield. Thereby it gives promise for sustainable yield against climate uncertainties responding well to organic inputs minimizing the burden of cost of cultivation to the farmers.

### **SESSION - 3**

#### **RICE IS LIFE**

- **Krishna Prasad, Director, Sahaja Samrudha**

The organization has built a people's movement in conserving the rich biodiversity. Movement in conserving. Farmers across our country have revived different rice varieties and Save our Rice campaign has supported this initiative. Conserving the rich agro diversity was not enough and though farmers follow the organic methods of farming are unable to market their produce due to insufficient market facility. Karnataka does not have an exclusive market to sell their organic produce, resulting in them ending up in a common market, thereby defeating the whole purpose. Marketing was the big hurdle that we had, only yoga schools were buying red rice from us and storage was an issue.

Sahaja Samrudha started popularising different native rice with establishing collaborative networks with the Scientific Community. Collaborated with Government agencies and Research Institutions for purification and multiplication of varieties, the Researchers helped in scientific characterization and documentation of varieties. Mainstream Media were involved in the conservation efforts and several articles were published in both National and Regional news daily's and Magazines. Consumers were the most important link in the popularization efforts, consumer councils were established. These were the ways that we created market for red rice and desi rice. We showcased the diversity

Promoted through Photography – 1. Use images to promote your rice varieties, show consumers what they actually look like. It is important that your photo tells a story. 2. Writing and documenting and writing articles 3. Asking nutritionists and scientists talk about or write about the desi rice. Now there are around 500 organic outlets in just Bangalore and they sell a minimum of 1 to 2 tons of red rice monthly.

A sure way to spread awareness about these unsung treasures has been Rice is not one, then middle men decide the price, we have to express the rice with their unique features and what the rice a specialty for then the farmer decides the price.

Natural rice – one of our scientists said that deep water variety of rice have a unique quality as they stand under water for longer periods they develop an ability to fight pests which is natural in them and so we started calling such rice as natural rice. And when we eat we also develop an ability to fight.

Promote your rice with a story – Consumers are to be educated about the different rice. Talk about the rice, tell story about the variety with photos and some writing. Nutritional analysis of different rice is very important and with the nutritional analysis we were able to market.

Promoting Black Rice – we worked with West Bengal farmers and linked them to the market and today we are bringing truckloads of black rice from West Bengal.

Desi Rice Mela, Red Rice Melas are an awareness campaign to popularize desi rice varieties. Celebrating the rich heritage of rare indigenous rice varieties, these Melas showcase 1000s of rice varieties to consumer. These are platforms to educate consumers, bring in more farmers into conserving desi rice. Melas are also good market places to market the rice varieties. Invite famous personalities and also photograph them holding the rice varieties and feature these in the newspapers, such innovations help promote your product. Hold food competitions so you get traditional recipes and also a way to popularize the flavors of each variety.

Advantage of the Melas is – an assured market for traditional rice, Premium price for the traditional rice varieties, high value for special rice, immediate payment, Bulk purchase, Recognition from Media and Govt., and Fair Trade.

Challenges of Marketing Rice – we are not able to bring a common pricing policy, working capital – no banks provide working capital for traditional products, Processing of Traditional rice- the rice is striped of the nutrients is processed so the processors need to know on how it has to be processed. Matured rice vs Steam Rice, Fine rice mania – consumers are looking at the beauty of rice and not the nutritional content of rice, Govt. Schemes – Govt providing free rice thru PDS, Marketing rare varieties, long-term storage facilities for unpolished rice. Sustaining Marketing Initiatives.

Not only marketing rice but also value adds on rice that is creating new art forms with rice ear heads or straw.

Creation of farmer groups at the local level and have linked them to our Farmer Producer Co. – Sahaja Organics.

Bharat Beej Swaraj Manch – Networking with seed saver groups from all over India.

Publications on Rice – every year we bring our calendar where we give details of each variety and the back page will be recipes.

#### **SESSION - 4**

#### **FARMER MARKET – Linking Rice Farmers to Consumers**

**- Ananda Theertha Pyati, Sahaja Samrudha**

We are growing desi rice in lakhs of acres but still not available in general stores or in super bazaars. Desi Rice is only available

Conventional Market is with many layers – Farmer sells produce to middlemen and then it is retailed to consumer.

Farmer Market – has very less layers and farmers sell directly to the consumer, eliminating the middle men. The farmers producing varieties of rice, millets, vegetables, oilseeds come together to market their produce at a single spot and sell directly.

Farmers market is started with an aim of

- Providing safe food to the consumers
- Ensure fair pricing of organic products for both, the farmers and the consumers
- Round the year supply to the consumers
- Specific and identified organic farmers only
- Came up with health and environment concerns

Benefits of Farmer Markets:

- Continuous availability of safe food
- Ensure fair pricing of organic products
- Protect the livelihoods of organic farmers
- Awareness on safe food and current agricultural practices
- Nutritional and food security

Challenges

- Less awareness on desi rice varieties
- Motivating factors in the consumption or purchase of Desi rice
- Unavailability of separate market for desi rice
- Least or no demand for desi rice varieties
- Difficulty in access to market of rice products- *for Consumers*

## **SESSION – 5**

### **MARKETING OF ORGANIC RICES - Sahaja Organics, Wholly Owned by Organic Producers!**

- **SOMESH B, CEO, Sahaja Organics, Bangalore**

Sahaja Samrudha Organic Producer Company Ltd (SSOPCL) marketing under the brand name “Sahaja Organics”. The Producer Company is a unique concept wholly owned by organic producers, who are necessarily primary producers committed to protecting the environment, and providing quality and health food with concern for consumers health.

The Company was established in 2010, with 724 Shareholders and 7 Directors.

The Company with a share capital of Rs. 27,26,500 has been constantly dedicated in promoting organic produce for rural farmers in urban areas.

With the object of making a mark in the urban market and building its brand, Sahaja Organics is already the largest wholesaler of organic rice, pulses and millets in Karnataka and has developed a connectivity network of consumers and producers for procurement & supply. The Company pays a premium price of 15-20 percent higher than the conventional market price. And not only that the profits earned every year a part of it is shared with the Shareholder Suppliers as a withheld price.

Collectives are formed at all the organic growing areas in Karnataka, commodity based and from these clusters the products are picked at farmgate or at the collection centers and transported to Bangalore to the Warehouse of the Producer Company. We have tied up with processing units that process our organic products so we maintain and certify all our products, right from land to our warehouse. Transparency and traceability is also maintained.

Supplying to about 550 organic outlets in 14 states and also throughout Bangalore, the products are all Organic and only traditional food crops, with exceptional quality standards, the products supplied are safe, tasty and nutritious. Traceability is our motto and at competitive prices.

Consumer reach has been with organizing Red Rice, Millet Melas, Safe Food Melas, Organic Melas. These platforms have helped build a good clientele. We have very prominent consumers and most of our promotion has been through mouth. These consumers have spread the word of our prompt and quality assured products.

Desi Rice Sales 2020-21 – quantity 203.5mt-value \$1.3cr

|                 |                     |
|-----------------|---------------------|
| Rajmudi         | Ponni Rice          |
| Black Rice      | Siddasanna Rice     |
| Red rice        | Jeera samba Rice    |
| HMT rice        | Doddabiraneelu Rice |
| Navara Rice     | Gowri Sanna Rice    |
| Diabetic Rice   | Sona Masuri Rice    |
| Gandhasale Rice | Bamboo Rice         |

Sustainable Business – the company sales in 2010 of Rs.19, 65935 has grown to 108064264 in the year 2020-21.

The Company has grown from wholesale business model to opening franchises all over Bangalore that has retail outlets, that supply to the consumers. Earlier we had only B to B business but now we have entered the retail market and now we have B to C also.

Our business model was also appreciated by Hon'ble Prime Minister in his Mann ki Baht.

## **DAY 8**

YouTube link for Webinar 8 - <https://www.youtube.com/watch?v=FYqhQclH7sw>

## **SESSION – 1**

### **PRODUCTION AND MARKETING OF TRADITIONAL RICE SEEDS**

- **Manju K A, Production Manager, SAHAJA SEEDS**

Sahaja Seeds the brand name for marketing of indigenous seeds of Desi Seed Producer Company. India's first farmer owned organic seed company.

The Company was established in 2014 with seed savers and seed producers producing high quality, organically grown, traditional, open pollinated vegetables and cereal crops seeds.

Organ is seed production are of two categories – Rare Varieties and Potential Varieties. Not all varieties are produced on large quantities. Only potential varieties are produced on a large scale but in our journey, we have seen that Desi Varieties were only considered as Rare varieties like Navara, Black Burma and now our farmers are growing on a large scale and many consumers are now even utilizing these varieties.

Potential Varieties are the one that have a Good market – like HMT, Burma Black, Rajmudi, Gandhasale and good yielding varieties are Sidda sane, Chinna ponni, Mysore mallige, Medicinal Rices – Navara (90Days), Karigajavilli, Karijeddu. Red Rices – Dodda biaranellu of 145 days.

Good Demand Varieties – HMT – a farmer developed varieties, fine grains and yield of 20-24qt/acre, highly suitable for organic cultivation. Grown in both kharif and rabi.

Burma Black – 150 days crops and grows well only in Kharif. Only sweet dishes can be prepared from this variety because its natural flavor is rich and sweet with nutty, complex flavor that adds visual and taste delight to any dish, it has quickly become one of our most popular rice. It is a popular variety and yield 12qt/acre.

Rajamudi - Superior to other unpolished rice varieties, it is mix of red and pinking colored grains a medium red rice and popular sweet rice grown widely in Karnataka and yields up to 25qt/acre. A healthy alternate to any unpolished rice.

Gandhasale - A traditional scented rice variety of Karnataka, has been the favorite of rice farmers for ages in Malnad region. Scrumptious variety highly fragrant, with excellent cooking quality, exclusive aroma and unforgettable taste can be used for special dishes like biriyani pulav and others. 150days crop and ideal for kharif season.

Sidda sanna- farmer bred variety and 18-20qt /acres and in Telangana it yields more than 22qt/acres. Very popular in southern India and grows both in kharif and rabi.

China ponni – 105days crop and yields up to 22-25qt/acre and tolerant to drought also.

Mysore maillige – again a farmer bred variety – 120 days crop and 25-30qt/acre. Grows on a large scale in Karnataka.

Navara - Navara rice cultivar bestowed with high medicinal properties. Though native to Kerala is grown widely in Northern region of Karnataka. Yield only 10-12qt/acres. You have soak 4-5hours before cooking

Dodda bairunellu – drought tolerant variety, grains are red in color and has medicinal value.

Criteria for selecting rice seed producers - not all can be seed producers so selection for seed producers is with a few criteria's – Seed must be obtained from an authentic source, so we enter into an MoU with the seed producers with a few terms – He/She have to be seed growers, continuous supply of seeds, type or variety farmer has been contracted to grow. Also, farmers knowledge on organic farming and seed production a must.

Selection of Seed Plot –The land/field must meet seed production requirements. The land must be ecologically suitable. The choice of the right nursery site is a prerequisite for proper seedling establishment, plot selected for seed production must be fertile, preferably light textured, with adequate irrigation and proper drainage system. The field should be free from weeds and volunteer plants from the previous crop. The field should not be infested with serious pests and diseases.

Isolation/ previous cropping: The seed plot should be well isolated in accordance with the selected seed. If it is rice as it is self-pollinating crop isolation is normally not very serious, but for vegetable crops isolation distance a minimum is a must. Rice seed should follow a rice crop, only after a minimum of 2years duration.



Crop monitoring – regular checks on the field has to be taken up, manual selection of seeds is done no harvesters are used as the seed harvesting.

Pricing Policy – prices of seeds are usually 40-50% more than the market buying price.

Cost of cultivation is calculated – land preparation, cost of compost, cost of seeds, nursery preparation, sowing of seeds or transplanting, de-weeding or mulching, crop management (irrigation, application of bi-inputs, staking etc.), Harvesting, seed separation /shredding and cleaning, grading, bagging, labeling and storage.

Germination percentage – seeds received are tested for germination and we test the seeds at the University of Horticulture Sciences. Seed Analysis Report. Farmers also can conduct germination but this done so it for authenticity.

Marketing Strategy – our target customers are individual farmers. Ngo- organizations are approached and we pitch or market for seeds. Govt programs – all Govt Programs that seeds are distributed to farmers the desi seeds are supplied through these programs. Another platform we use for marketing – participation in Seed Festivals and Seed Meals, regional and national level seed festivals are organized and seeds are sol.

## **SESSION - 2**

### **GUIDE LINES FOR QUALITY SEED PRODUCTION**

#### **ROLE OF ATC-Fulia and Folk Crop Diversity in Sustainable agriculture**

- **Dr. Anupam Paul, Deputy Director of Agriculture, ATC-Fulia, West Bengal**

Sujata offers Milk-Rice to the Buddha - Offering kheer, thus breaking the seven year-long fast of Gautama Buddha in 2600BC. The Rice is 'Kala Namak'. Buddha Rice, popularly known as "Kala Namak" is one of the finest varieties of aromatic rice in India and is still in Cultivation.

It is also known that when Alexander the Great invaded India in 327 B. C., it is believed that he took rice back to Greece, at that time nobody in Europe had heard of rice. It was Alexander who introduced it to the Western world.

Alexander took basmati as a gift to his master Aristotle, the Greek philosopher and its was he who named it as *Oryzin* and that is how the scientific name 'Oryza Satava' and this is the word has been the source of all European language for Rice.

But while the rice tradition in the rest of the world is relatively well documented, India has few records of how our great rice dishes developed.

It is also known and a Western view is that Arabs took rice all over the world. There is evidence for this. Paella comes from the rice dishes of Arab cuisine, and the Arabs planted rice in Spain. Even the Italians got their rice from Muslim travelers and traders, which is one reason why it only features in a few dishes of their dishes.

It is the mainstream Scientific stream that think that farmers don't have the knowledge. But farmers have to be free to develop, exchange, sell as they have requisite knowledge needed to improve the crop.

Experience of Rice Conservation at Fulia – the Centre collected folk rice varieties from farmers and a few organizations all over India Sambhav of Odisha, Thanal of Kerala, Sahaja Samrudha of Bangalore, and others in other states. Today we have more than 300 folk Rice varieties and are the largest conserver of Folk Rice in India.

Till date more than 500 farmers have received folk rice varieties directly from the center and the seeds reach more than 800 farmers indirectly.

Fulia is an agriculture training Centre and we have been conducting trainings, seminars to farmers on Rice and we have created a living farm of 'folk' rice varieties where we study their methods of growth, their properties and determine their taste.

Rice Cultivation with Floating Azolla – it is a natural farm as nothing is used to grow rice at our Centre.

Now we have differentiated between seed producers and grain producers. The seeds are purified in the field itself. If the seeds are impure or mixes then they don't perform well and with low yield.

Seed treatment – Before sowing, seed lot is to be dipped in Braine water solution (450gms of common salt in 3litres of water) for 10 minutes and 1.0 kg of seed is soaked. Floating chaffy seeds are to be discarded and heavier seeds which settle at the bottom need to be selected. Seeds are to be taken out from the salt solution and washed thrice in plain water. Thereafter, seeds are to be soaked overnight in 1 liter of raw cattle urine, followed by draining the urine and keeping the seeds in a gunny bag in moist condition for germination.

Seed Bed - Sprouted seeds are to be broadcasted uniformly in each bed. The beds are to be kept wet and water should not be allowed to stagnate during the time to avoid injury to the germinating seeds and tender young seedlings.

Seed selection- after seed is harvested you have to hand pick for pure seeds, if there is a different looking one discard the impure and different seed varieties. Plants on the field are to be observed and when any different ones are visible, rouging has to be done. Rouging is the removal of undesirable plants from seed production plots and it can be done at any time of the crop stage. They may be volunteer plants from earlier crop or off-types. Being a self-pollinated crop, genetic purity of rice varieties has to be maintained by removing the off-types detected in the field. Regular field inspections are critical to identify off-types and to remove them before they contaminate the seed production plots. Field inspections should be conducted at vegetative, flowering, pre-harvest, and harvest stages. The volunteer paddy plants emerging from the shattered grains of the previous crop have to be removed as and when they are noticed in the field.

main field preparation- Main field should be prepared with the use of green manure and the green manure crop should be trampled at 10 days prior to transplanting to allow proper decomposition. Azolla can be released to grow in the field having shallow water. Other details are discussed hereunder.

Transplant – single seedlings are transplanted with maintaining the space between each seedling in the SRI method. Single seedling transplant was practiced in West Bengal in 1905.

Once seeds are harvested, Preservation of Seeds is important. After through drying and winnowing, seed is preserved in seed preservation units made of locally made with straw.

Prof R N Bose developed a method of preserving seeds – 1ltr of water bottle fill with 650gms of paddy seeds and a pinch of Bleaching powder and mix thoroughly. Then add rest of the seed and mix again, there should not be any head space and cap it tightly. The bottle is kept in a dark place. Harvest of December 2021 can be used in June 2023.

#### **SESSION – 4**

## WAY FORWARD

- **Sridhar Radhakrishna, Programme Director, Policy Advocacy THANAL**

Sridhar – when we started the Save Our Rice in 2004 in Kerala the paddy lands were disappearing and similarly in India all over the same situation. So, in a workshop in 2004 we were discussing and then we came up with an idea and decided to being a campaign - Save Our Rice (SoR) to safeguard paddy farming systems and prevent further erosion of diversity and loss of paddy eco systems. I still remember 'Nammalvar' saying that we would be creating History. It is a well-deserved great appreciation as today the Save our Rice Campaign has successfully reinstated the rice farming ecosystem, the network has spread – we have experts, knowledgeable farmers, scientists, policy, academia, marketing, brand builders and many more.

India had more than 150000 varieties of rice and now with the campaign we have revived two thousand and the gene banks might have another few thousands. So, the rest is all lost which can't be revived.

With climate change we have lost more as the seeds were just plucked and put in a Greenbank for longer periods and then brought out to adjust to the present climatic condition then it would not be possible. Seeds have to be saved and planted for it to continuously evolve to adapt to changing temperatures and weather conditions. As the seed used to one particular environment will not adjust to changing environment. Farmers are also making the seeds evolve through selection breeding. Seeds were developed by farmers in earlier times to similar agro-ecological conditions and farming seasons. So, all this was disturbed for 50years, farmers knowledge of preservation took a back seat with seeds that were provided to them without it being grown agro-ecologically. So today with the campaign we have seen the revival of such knowledge and the seeds that have been reinstated into our farms. So, the work is historic and a collective work with a huge network. This movement from seed to food has created and brought back farmers to innovate and develop seeds and farming and food system and enjoy their profession. We believe that the Campaign has demonstrated that paddy eco-system can be sustained with indigenous paddy varieties reverting back to the paddy farmers' fields and filling consumer plates. There is much more work yet to be done and this can be done with many more farmers around the country coming into the manifold.

Now we have to organize ourselves we have to reinstate the knowledge of farmers, the seeds, the scientist. We have realized it and now we have to make the country realize that there is a need for policy to change to reinstate our seeds and farming systems.

In SoR we had meetings in the form of Workshops, Trainings, Festivals, Fairs so we could take it to the people, awareness building was a critical point. All these programs were for building awareness for farmers and consumers

We have to institutionalize the process of Involving Research Institutes. Desi is a not fanatic, it is to describe the people, cultures of a specific place or of a country. Desi is something that is localized and adapted to the region. We are doing this because of the passion the farmers have and also consumers with awareness. This has made farming a matter of culture, one that has a belonging, a passion, an emotional connect, to produce for the nation. It's through this culture of agriculture that even a nation can benefit along with the farmers.

The conservation has been happening locally but we need to take it further. We have established 20 plus Community Seed Banks and we need more than 100s of such banks where community takes it forward. We have made more ecological farming systems that have built base but now we need resilience in farming as with the climate change we have to be addressing in a bigger scale with improving and preserving more such seeds.

Eco-restoration - Ecological restoration is nothing but recovering an ecosystem that has been degraded, damaged, or destroyed. The campaign has eco-restored the rice farming system. We have created conditions that were necessary for recovery. CSB were created to recovery and preserve the almost losing diversity and the farmers' knowledge, now many farmers are continuously working on the crops and improving them, even some farmers are breeding and developing new varieties that can adapt to changing conditions. Eco-systems approach that has brought back the insects, the birds, the animals who can live along with us on the fields. Farmers are the eco-system restorers - climate resilience, conserve biodiversity, and promote wellbeing—while also increasing productivity and improve their incomes.

Institutionalize the eco-restoration for the next future years.

Farmers have to re-organize themselves for the commercial society. Farmer Producer Companies is one but then Federating ourselves and create a future that we want. Changing and amplifying our choices into meaningful collective impact.

There are a lot of players – so how do we differentiate frauds from goods - We need to have our own system of certifying ourselves. Organizing ourselves for potential. Collectives of engaging with modern society. Helping to develop thriving enterprises based on the products.

Marketing and Consumers – unless markets don't respond farmers will not continue.

Consumer Awareness – is still less and we need to put a lot of effort. We need to think about how this will be a forced action.

Communication – communicate in a better way to consumers, the Government, the Research media.

We are used to the conventional form of institutions – NGOs, Collectives Farmer Groups but the other side is all about Federations and Consortiums. We have to have an initiative to create a Rice Consortium. A consortium for sustainable approaches to farming practices, incentivize production and demand for sustainable rice with market-based instruments, deliver policy support to governments, and improve knowledge sharing and collaboration on sustainable rice solutions. Consortium to target change in farming techniques through policy and market incentives. A national consortium **of all groups**, civil society partners, bringing together ecological, policy and market-led approaches, producers, rice seed savers, rice seed producers, rice markets, and many more for rice sustainability, this has to be unique vehicle to deliver benefits for the Rice biodiversity and Rice Sustainability.

**A-Way Forward ....  
Action Plan**

An action plan for a follow up with the participants was drawn. As many individuals and organizations wanted to take forward the revival and conservation of rice. Now a whatsapp group has been formed s a follow-up with all the participants attended the webinar, the group includes scientists, nutritionists, food experts, bloggers, civil society groups, media persons, farmers, entrepreneurs, start-ups.

| S.No | State | Districts (If any specific) | Activities                    | Responsible Person | Remarks / What kind of support is needed? |
|------|-------|-----------------------------|-------------------------------|--------------------|---|
| 1    |       |                             | Conceptualizing of consortium | KP, Ponanbalam     | Map people/groups working on DESI         |

|    |              |                  |   |                 |   |
|----|--------------|------------------|---|-----------------|---|
|    |              |                  |   |                 | RICE at state level                           |
| 2  |              |                  | Sourcing Seeds from research Centre - working seed group  | RRA Network     | TN - Kerala - Usha                            |
| 3  |              |                  | Directory or source book for Desi Rice Savers   |                 | Publication - Shaja/RRA                       |
| 4  | Telangana    | Vikarabad        | List of organic farmers, Seed varieties ..... Producing quality rice.<br><br>(Support to establishing paddy diversity blocks in Vikarabad)  | Aparna          | Coordinate with Uday, RRA Geeta, sahaja seeds |
| 5  | TN           |                  | Rice processing workshop  | L K Goutham     | Offline or online                             |
| 6  | Kerala       |                  | Western Ghat paddy diversity,   | Usha Soolapani  | Sahaja, Tunnel, KP                            |
| 7  |              |                  | Help in connect to some of the folks in the cooking side. Folks who are consulting with restaurants and other chefs etc. These folks always looking for new ways and many supports such movements | Madhu Reddy     |   |
| 8  |              |                  | Schedule national/ international tours with farmers<br><br>Organize Webinar   | Seema           | Fundraise if needed                           |
| 9  | Maharashtra  |                  | Rice variety book in marathi.   | Nilima Jowar    |   |
| 10 |              |                  | Digital directory (App) to have all the updated info.   |                 | In process from Wassan and RRA                |
| 11 | Chhattisgarh |                  | Organics Rice Workshop of 2 days - Sep or Oct   | Laxman          |   |
| 12 | Karnataka    | Puttur/Mangalore | Workshop near Puttur or Kasargod  | K N Subrahmanya |   |