**FINAL REPORT**

# EXPLORING THE MARKET POTENTIAL OF INDIGENOUS RICE VARIETIES FOR LIVELIHOOD ENHANCEMENT OF THE FARMING COMMUNITY

**Project implementation district:**
Nayagarh District
(Odisha, India)

**Report by:**
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## Project Background:

Nayagarh, one of the eastern districts of Odisha is situated in the hilly ranges in the West and its North Eastern parts have formed a small well cultivated fertile valleys intersected by small streams. Rural population constitutes 95.71% of total population. ST and SC population of the district is 5.88% and 14.04 of the total population, respectively. Near about 62.6% population lives below poverty line in the district which includes 68% rural population. Agriculture being the main source of economy and subsistence for the rural people plays a critical role in the economy of the district and the livelihood of majority of its population. The area under paddy coverage estimates to 71.8% of the total cropped area.

Nearly 90% belongs to marginal and small farmers having 62% land while remaining 10% medium and large farmers have 38% land as operational holding. Total workforce in the district is about 2.89 lakh, of which 29.8% are cultivators and 32.75% are agricultural labourers.[1]

The high external input based 'Green Revolution' strategy that continued in Orissa State Agriculture Plan-2008 which suggests increasing the Seed Replacement Rate (SRR) and the State has achieved 12% SRR in paddy till 2007-08 and planning to achieve 25% by the end of the Eleventh Five Year Plan[2].

The exchange of seeds was common phenomenon in the villages. 'Seed conservation' was integral to agriculture activity. 'Seed replacement' is being promoted as solution to hunger and nutrition deficiency has also reflected in the district. Nearly 41 indigenous rice cultivars being cultivated has been irretrievably lost and another 34 varieties are in the process by only four varieties of genetically uniform semi-dwarf high yielding varieties[3] and made skilled, self-driven farmers to highly depend upon external agencies. On the other hand, yields of HYVs were stagnating, despite increases in expensive external inputs like chemical fertilizers, pesticides, herbicides, etc., and soil fertility has also been declining. Risk of epidemics has lead to ever increasing consumption of chemical pesticides. All these factors have been leading to increases in cultivation costs without parallel increases in incomes and put farmers in a never ending debt trap. The per capita debt is Rs 9316 in Odisha[4] which may count for the farming community of the district also.

The government has not been hesitating in claiming 'record production' every other year. But in each of the years, 'crop loss due to fake or low-quality seed' or 'late supply of seed' has been reported. Post harvest paddy procurement is an all-time issue among the farmer community in the state. For the Khariff-2010, though the Government has declared Rs 1000/- and Rs 1020/- for normal and fine paddy respectively, but the actual price received by the farming community ranges between Rs 720/- to Rs 850/-[5].
The production, processing and marketing of agricultural goods are central to food security and economic growth. The manifestation of this neglect has also been seen in the food grain procurement policies of the government and with the above context rice cultivation has thus become no longer economically viable.

**In this background,** the project has explored the possibilities of conservation, production, value analysis and also negotiating a better price for the produce; on the other hand, valorizes common sense principles of community autonomy, cultural integrity, and environmental stewardship i.e. people determining for themselves just what seeds they plant, what animals they rear, what type of farming occur, what they will ultimately eat on their plate and what price will suit them for their produce. Thus, this initiation is aiming towards making communities food sovereign.
The following are the objective and activities planned for the project.

**Objectives:**

[1] Agricultural census 2000-01
[2] Status of Agriculture 2008, Government of Orissa
[3] A survey information that has been collected from 21 villages of 2 blocks of Nayagarh district
[4] As answered by Finance Minister on 6th December 2010 in Assembly questionnaire session.
[5] A survey made in Southern Rayagada, Eastern Nayagarh and Western Baragarh district of Odisha

**Objective-1:** To conserve depleting indigenous rice cultivars

**Activities**:

1.1 Documentation of indigenous rice varieties along with characteristics mapping and respective farming system through participatory tool (Time line tool)

1.2 Initiation of village level farmer's Institutions for the purpose of exchange and collection of traditional paddy varieties and to initiate a process of learning and sharing to knowledge associated with it

1.3 Establishing collaborative on-farm seed conservation units

1.4 Developing "community seed information system (C-SIS)"; facilitating seed exchange among the old and new farmers for the next phase conservation practices

**Objective-2: To explore the market potential of indigenous rice varieties for livelihood enhancement of the farming community**

**Activities**:

1.1 Organizing the traditional rice cultivators as Producers' group, so that they can collectively negotiate fair prices for their produce

1.2 Nutritional analysis of the Rice varieties (both HYVs & indigenous) at Health Laboratories

1.3 Contact will be made with the ICMR scientist and other premier nutritionists to initiate a discussion with the 'comparative nutritional value of rice cultivars and its impact on consumer health' which will lead to get 'nutritional certification' of the respective cultivars

1.4 Initiating a consumer discussion forum with various stakeholders such as children, parents, teachers, doctors, journalists, rice traders, mall managers, politicians, researchers and the concerned members of the society

1.5 Organizing a 'Rice Mela' (exhibition-cum-sale) at a central location in Bhubaneswar at least two months before Kharif season

In this backdrop, NIRMAN has organized a series of consultation with small and marginal farmers documented the local rice varieties existing with the farmers and convinced them to conserve in their own field. It was found in the consultation that there were nearly 40 numbers of varieties of Rice, which were cultivated in this area years back. Now that has come to few numbers only. It was felt by the farmers that these varieties need to be conserved, not only for the fulfilling requirement of seeds of farmers but to conserve the local agro-biodiversity which are under threat after the GR technology.

**Village Level farmers Meeting:**

To sensitize the farmers and the community and build a mass notion in favor of usefulness, conservation and promotion of traditional varieties, Nirman conducted intensive village level meetings in Biruda, Jharapada, Khairapati, Baghera and Sunalati for selection of farmers for indigenous paddy conservation work. These meetings are very crucial to overcome the stigma within our farming community, society and departmental officials that the traditional varieties are always outdated and not required anymore.

**Farmers Group formation:**

Following to mass village level meetings, there was an emerged need form the group of the willing farmers to initiate an organized movement. Indigenous Paddy Cultivar's Group is formed in respective villages. All the farmers are trained on organic methods of cultivation and the variety of seeds were selected for cultivation according to their land types.

**Selection of Land and Indigenous Paddy Variety:**

| Farmer's Name (Demonstration) | Village Name | Variety (Local Name) | Days | Root | Plant Height | Length of Panicle in cm | Land type (U/M/L) |
|---|---|---|---|---|---|---|---|
| Ram chandra Das | Biruda | Basumati | 145 | White | 164 | 28 | M |
| Rabi Mahapatra | Baghara | Alatapata | 145 | Makamulia | 151 | 32 | L |
| Debendra Sahoo | Biruda | Nadiparabatkalia | 140 | Black | 163 | 27 | M |
| Krushana ch Das | Biruda | Machhakanta | 145 | Black | 168 | 26 | M |
| Gadadhara Sahoo | Tipura | Lakhyhira | 120 | White | 68 | 26 | U |
| Purna ch Raula | *Tipura* | Paschimmhipala | 145 | White | 163 | 26 | M |
| Fakira Jena | Biruda | Padamkesari | 150 | White | 200 | 29 | L |
| Rupa Jena | Biruda | Tulishabasa | 145 | Black | 166 | 29 | M |
| Bharamar Das | Biruda | Jhimani | 140 | Black | 147 | 26 | M |
| Bharamar Das | Biruda | Methimahipal | 140 | Makamulia | 136 | 27 | M |
| Ramesha Muduli | Biruda | Belamanji | 145 | Makamulia | 133 | 25 | M |
| Sanatan Muduli | Biruda | Nandika | 140 | Black | 135 | 22 | M |
| Prahallada Palei | Biruda | Baliji | 145 | White | 167 | 28 | M |
| Achuta Muduli | Biruda | Baiganmanji | 145 | Black | 164 | 27 | L |
| Sankarsana Muduli | Biruda | Pathara | 145 | Black | 140 | 31 | M |
| Jayakrushan Mandala | Biruda | Kalakoili | 145 | White | 173 | 30 | M |
| Upendra Sahoo | Biruda | Kusumkunda | 145 | Makamulia | 140 | 27 | M |
| Matia Jena | Biruda | 141 | 145 | White | 150 | 24 | M |
| Gokula Maharana | Biruda | Magura | 140 | Makamulia | 144 | 24 | M |
| Drujadhan Behera | Biruda | Patalagi | 140 | White | 162 | 28 | M |
| Jharia Das | Jharapada | Talabata | 145 | Makamulia | 182 | 26 | L |
| Chakradhara Prusty | Biruda | Kalijiri | 145 | White | 181 | 29 | M |
| Haramohan Patra | Khairapati | Kadaliachampa | 150 | Black | 177 | 31 | L |
| Haramohan Patra | Khairapati | Mahullata | 145 | Makamulia | 162 | 28 | L |
| Haramohan Patra | Khairapati | Saruchinamali | 145 | White | 160 | 31 | M |
| Haramohan Patra | Khairapati | Kainchafulla | 145 | White | 127 | 29 | M |
| Satrughan Parida | Baghara | Mahipala | 145 | White | 128 | 28 | M |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Gangadhara Das | Biruda | Maurakhantha | 145 | Makamulia | 163 | 25 | M |
| Pitabasa Dalia | Sunalati | Badabharikadama | 150 | Black | 123 | 28 | M |
| Antryjami Nayak | Sunalati | Karpurkeli | 140 | White | 174 | 26 | M |
| Chakradhara Mahapatra | Baghara | Bharikadama | 145 | Black | 128 | 27 | M |
| Akura Mahapatra | Baghara | Kanthasola | 130 | White | 142 | 24 | U |
| Upendra Jena | Tipura | Phampeswar | 145 | Makamulia | 150 | 20 | L |

**Input Support:**
The farmers were asked to do similar farming as it is done for other varieties, Inputs like good quality indigenous seed, organic compost, SRI practice of cultivation and other agronomic practices are provided to farmers. The care was taken to make the production process very simple and not dependent on much of external inputs or complex technologies.

**Vermi-Compost** of 10 kgs was supplied to the farmers to apply in their paddy. All the farmers were trained on preparation and use of liquid- manures in their crop.

**Onsite Field Guidance:** The field organisers of NIRMAN visited the farmer's field every week and provided necessary guidance to the famers in time.
The field organizers of NIRMAN made regular field visits and supported the farmers to make appropriate check of field conditions, weed control, pest and disease management and take various measures of plant performance like tillers, leaf area, panicle initiation days, panicle length, disease symptoms, insect resistance or susceptibility behaviour of the verities.

1: **Farmers field visit by Nirman Field Organiser**

**Exposure Visit of Farmers:**

Ten farmers and field organisers of Nirman were given field exposure to see such practices followed elsewhere and they were convinced that the initiative is not totally new and trail is made with them. This was helpful to convince them that the project is not suffering form risk of failure. The farmers and team visited to Niali, in Cuttack district (demonstration fields of Shri Natabar Sadangi) to see and learn the field experiences in the indigenous paddy conservation processes.

Farmers group exposure visit to Nilai

Farmers group interacting in field

**Production Details:**

| Traditional variety | Duration of crop (in days) | Yield(in Qntl/Ac) | |
|---|---|---|---|
| | | SRI method | Non-SRI method |
| 1. Padamkesari | 150 | 16.5 | 15 |
| 2. Tulasibasa | 145 | 14 | 12 |
| 3. Jhimani | 140 | 14 | 12 |
| 4. Methimahipal | 140 | 18 | 15 |
| 5. Belamanji | 150 | 16 | 15 |
| 6. Nadika | 140 | 18 | 16 |
| 7. Balaji | 145 | 18 | 14 |
| 8. Baiganmanji | 150 | 22 | 18 |
| 9. Pathara | 150 | 20 | 18 |
| 10. Kalakoili | 150 | 24 | 20 |
| 11. Kusumkunda | 145 | 18 | 16 |
| 12. Dubaraj | 145 | 18 | 15 |
| 13. Magura | 140 | 20 | 18 |
| 14. Patalagi | 145 | 16 | 15 |
| 15. Talabata | 145 | 20 | 16 |
| 16. Kalagiri | 150 | 15 | 13 |
| 17. Mahulalata | 145 | 20 | 18 |
| 18. Saruchinamali | 145 | 22 | 20 |
| 19. Kadaliachampa | 145 | 24 | 20 |
| 20. Kinchafula | 140 | 20 | 16 |
| 21. Nalijaganatha | 145 | 24 | 22 |
| 22. Maurakhantha | 150 | 20 | 18 |
| 23. Badabharikadama | 145 | 24 | 22 |
| 24. Karpurakeli | 150 | 12 | 8 |
| 25. Laghubhutia | 140 | 18 | 16 |
| 26. Kanthasola | 130 | 18 | 15 |
| 27. Chameswer | 145 | 20 | 18 |

**Screening of some potential varieties:**

The varieties cultivated in farmers field under usual farming micro climate has indicated that the yield levels and performance of other parameters like insect pest resistance, lodging resistance, chaffiness, thousand grain weight and average yield is good.

The field data on yield is based on crop cutting methods and this is extrapolated to hectare units. We are in the process of standardizing statistical assessments to define degree of error in the assessed yields. A general sense within our members and farmers are to reduce yield level by, not more than, 10%.

The inference from all field trials is that the average yield level of all varieties is 4.4 tons/hectare with maximum of 4.7 ton/hectare for varieties like Rupali, Sialilata and Sunei and minimum yield level is 4.1 tons/hectare for varieties like Kadalichampa, Mahipal and Padmakeshari.

| Crop duration (days) | No of Varieties | Average No. of Tillers (in nos) | Average No of grains/ panicle | Average of 1000 grain weight (in gram) | Average of Chaff grains (%) | Average of Yield (qtl/ha) | Names of potential varieties (maximum and minimum yield varieties) |
|---|---|---|---|---|---|---|---|
| 120 | 2 | 19 | 270.50 | 22.00 | 12.50 | 45.00 | |
| 125 | 3 | 23 | 214.00 | 23.33 | 12.67 | **47.87** | Rupabali, Sialilata, Sunei |
| 140 | 4 | 17 | 237.00 | 26.25 | 12.00 | 44.63 | |
| 145 | 25 | 19 | 275.12 | 23.80 | 13.12 | 43.94 | |
| 150 | 3 | 17 | 284.33 | 24.33 | 15.33 | 41.73 | Kadalichampa, Mahipal, Padmakeshari |
| 160 | 1 | 30 | 200.00 | 24.00 | 11.00 | 46.90 | |
| **Grand Total** | **38** | **19** | **264.79** | **23.97** | **13.05** | **44.28** | |

**Varieties for different land types:**

### *Varieties for low lands:*

The field findings suggest that Ratnachudi variety is the best yielder (4.69 ton/ha.) in low land condition compared to Kadalichampa, Mahipal and Padmakeshari (4.17 ton/ha.) as low yielders and other varieties with medium yield levels of 4.38 tons/ha.

### *Varieties for medium lands:*

The varieties like Nandika, Nandiparbatakalia and Magura are the best yielder (4.49 ton/ha.) in medium land condition compared to other varieties with medium yield levels of 4.46 ton/ha and low yield levels of 4.38 tons/ha.

### *Varieties for up lands:*

The varieties Sunei and Sialilata are the highest yielder (4.95 ton/ha.) in upland condition compared to other varieties with yield levels of 4.5 ton/ha.

The details of yield figures and parametric performances are given in table below.

| Land Type | Crop duration (days) | Count of Variety (Local name) | Average of Avg. No. of Tillers (in nos) | Average of No of grains/ panicle | Average of 1000 grain weight (in gram) | Average of Chaff grains (%) | Average of Avg. Yield (qtl/ha) | Name of the varieties (maximum and minimum yield varieties) |
|---|---|---|---|---|---|---|---|---|
| **Low** | 140 | 1 | 15 | 225.00 | 28.00 | 12.00 | 43.80 | |
| | 145 | 12 | 19 | 276.58 | 24.33 | 13.75 | 44.08 | |
| | 150 | 3 | 17 | 284.33 | 24.33 | 15.33 | 41.73 | Kadalichampa, Mahipal, Padmakeshari |
| | 160 | 1 | 30 | 200.00 | 24.00 | 11.00 | 46.90 | Ratanchudi |
| | | **17** | **19** | **270.41** | **24.53** | **13.76** | **43.82** | |
| **Med** | 125 | 1 | 15 | 190.00 | 26.00 | 10.00 | 44.60 | |
| | 140 | 3 | 17 | 241.00 | 25.67 | 12.00 | 44.90 | Nandika, Nandiparbatakalia, Magura |
| | 145 | 13 | 19 | 273.77 | 23.31 | 12.54 | 43.80 | 13 varieties |
| | | **17** | **19** | **263.06** | **23.88** | **12.29** | **44.04** | |
| **Up** | 120 | 2 | 19 | 270.50 | 22.00 | 12.50 | 45.00 | |
| | 125 | 2 | 28 | 226.00 | 22.00 | 14.00 | 49.50 | Suneli, Sialilata |
| | | **4** | **23** | **248.25** | **22.00** | **13.25** | **47.25** | |
| **All** | | **38** | **19** | **264.79** | **23.97** | **13.05** | **44.28** | ***(Total & Average values)*** |

**"Community Seed Information system (C-SIS)";**

### *Establishing collaborative on-farm seed conservation units:*

This is meant for facilitating seed conservation, production and exchange among the old and new farmers. The project has successfully mobilized 38 farmers to regularly do field trials of potential traditional varieties and select best performing ones. The produce of best performer varieties are harvested, processed and conserved with technical selection procedures for distribution of seeds to other farmers.

### *Exchange of traditional varieties with other farmers:*

| S.N | Village | Name of the Farmer | Adoption of traditional varieties and shared with other farmers |
|---|---|---|---|
| 1 | Khairapati | Haramohan Patra | Kadaliachampa, Mahullata, Saruchinamali, Kusumkunda, Pathara |
| 2 | Biruda | Bhamara Das | Jhimani, Mathimahipal, Magura |
| 3 | Biruda | MatiaJena | 141, Balaji |
| 4 | Biruda | Upendra Sahoo | Balaji, Kusumkunda, Nandika, |
| 5 | Biruda | Fakira Jena | Tulasibasa, Talabata |
| 6 | Biruda | Sankarsan Muduli | Magura, Nandika, Kalakoili |
| 7 | Biruda | Ram Das | Basumati |
| 8 | Biruda | Prahallada Palei | Balaji, Nandika |
| 9 | Biruda | Sanatana Maduli | Nandika, Balaji, Baiganamanji |
| 10 | Baghara | Prafulla Mahapatra | Pathara, Kalakolia, Baiganmanji, Karpurkeli |
| 11 | Baghara | Satura Parida | Bharikadama, Mahipal, Baiganmanji |
| 12 | Tipura | Gadadhara Sahoo | Lakhyhira, Basumati |
| 13 | Sunalati | Pitabas Dalei | Badabharikadama, Padamkesari, Karpurkeli |

**Traditional Rice Producers' Group:**
28 numbers of traditional rice cultivators are united to form producer's groups in our project villages. The head office is located in Biruda village. The producer group is named as *Ramachandi Organic Producer's Group*. Major activities of this group are to popularize the traditional varieties among other farmers and the methods to improve yield of the local varieties.

## Nutritional Analysis:

***Dialogue with the ICMR scientists and other premier nutritionists for Nutritional Analysis:***

For nutritional analysis, first we discussed with Orissa University of Agriculture and Technology and then contacted CRRI, Cuttack. But, it was not possible to do analysis in their laboratories. Then we contacted to Mr. Krishna Prasad of Sahaj Samrudh (Bangalore) and sent the samples to Pristine Laboratories, Bangalore, which is a certified laboratory by Solvent Extractors Association of India (SEAI) and Agmark, Government of India. The nutritional analysis reports are obtained from them and the analytical findings are summarized below.

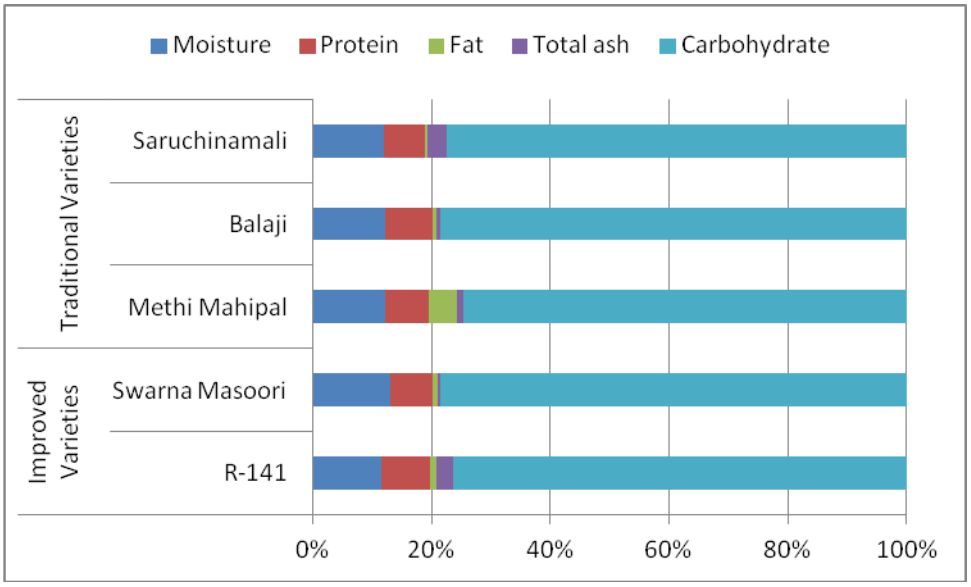
***Summary of Nutrition Analysis Report from Pristine Laboratories, Bangalore***

| SN | Test Parameters | Improved Varieties | | Traditional Varieties | | |
|---|---|---|---|---|---|---|
| | | R-141 | Swarna Masoori | Methi Mahipal | Balaji | Saruchinamali |
| 1 | Moisture | 11.60% | 13.04% | 12.21% | 12.25% | 11.99% |
| 2 | Protein | 8.14% | 7.19% | 7.27% | 7.87% | 7.02% |
| 3 | Fat | 1.03% | 0.76% | 4.84% | 0.82% | 0.44% |
| 4 | Total ash | 2.95% | 0.44% | 1.08% | 0.57% | 3.21% |
| 5 | Carbohydrate | 76.28% | 78.57% | 74.60% | 78.49% | 77.34% |
| | | **100.00%** | **100.00%** | **100.00%** | **100.00%** | **100.00%** |
| 6 | Metabilezable energy | 346.9 Kcal/ 100g | 349.88 Kcal/ 100g | 371.04 Kcal/ 100g | 352.82 Kcal/ 100g | 341.4 Kcal/ 100g |
| 7 | Calcium | 0.82% | 0.10% | 0.24% | 0.26% | 0.92% |
| 8 | Iron | 14mg/ 100g | 2.5mg/ 100g | 2.6mg/ 100g | 2.5mg/ 100g | 16mg/ 100g |
| 9 | Total dietary fiber | 8.79% | 4.93% | 10.03% | 9.26% | 8.07% |
| 9.a | Soluble dietary fiber | 1.92% | 0.12% | 0.78% | 0.91% | 2.17% |
| 9.b | Insoluble dietary fiber | 6.87% | 4.81% | 9.25% | 8.35% | 5.90% |

Percentage analysis on weight basis indicates that traditional variety Methi Mahipal has lowest carbohydrate content (74.6%) and Balaji has highest carbohydrate content of 78.49%.

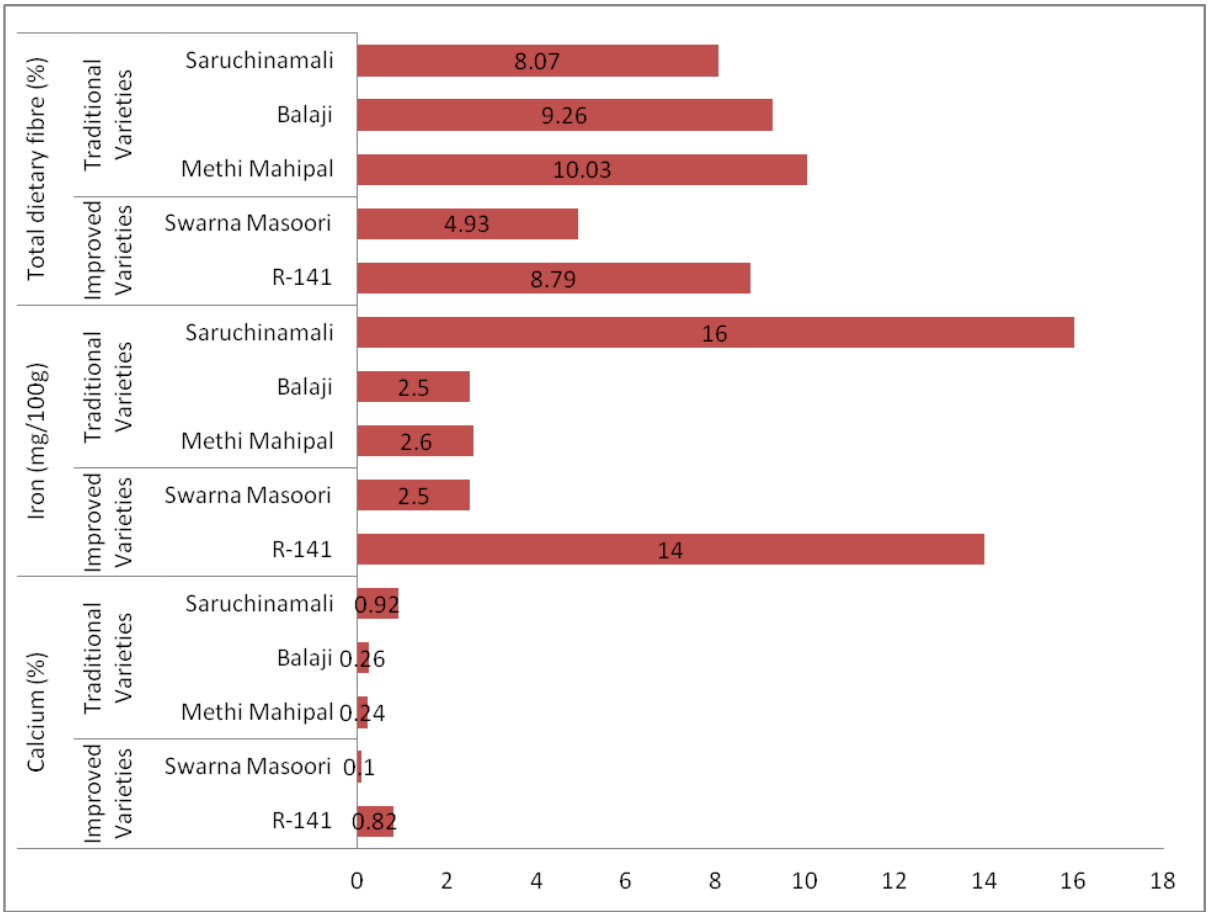
Protein content is highest in improved variety (R-141, 8.14%) followed by traditional variety Balaji, 7.87%.

Plant origin fat content is very good in Methi Mahipal (4.84%) and other varieties have very negligible plant origin fat.




Minerals and fibre content analysis indicates that Calcium content (in %) is highest in R-141 (improved variety) followed by Saruchinamali (traditional variety). Iron content (in mg/100g) is very good in Saruchinamali and R-141.

Total dietary fibre is very good in Methi Mahipal, Balaji, Saruchinamali and R-141. Soluble dietary fibre is highest in Saruchinamali (2.17%) followed by R-141 (1.92%).



**Consumer discussion forum:**

Consumer discussion forum was initiated for sharing with various stakeholders such as children, parents, teachers, doctors, journalists, rice traders, mall managers, politicians, researchers and the concerned members of the society.

Initial discussion was held with urban consumers groups and we got positive responses. We found that these consumers are concerned for quality in terms of appearance and aromatic value. But, they were not much aware of the alternatives for the rice they purchase which are grown with chemical fertilizer and pesticide. After discussion of safe rice and its availability, these consumers have shown interest for local rice variety which is grown in organic ways.

After getting the nutritional analysis report, we have discussed with more consumers and we are trying to link the producer group with urban consumer group, so that there will be assured market of the indigenous variety of rice for farmers, thereby it will motivate farmers to grow indigenous variety and these varieties will be conserved at farmer's field. We have also thought to develop small IEC materials on the advantage of indigenous variety of Rice for larger dissemination and outreach.

**State Level Workshop on Conservation of Rice Diversity and Marketing of Organic Rice cum Rice Mela:**

A state level workshop on Conservation of Rice Diversity and Marketing Organic Rice cum Rice Mela was organized in Bhubaneswar in IMAGE on 27 March 2013 supported by GGF and Save Our Rice. NIRMAN took adequate care to display indigenous rice and cultivator farmers apart from academicians and researches. It has a range of variety to display and sale organic rice; rice from a range of traditional variety, medicinal variety, scented and suited to diabetic patients.

The workshop focused on objectives like (i) Initiating a consumer discussion forum with various stakeholders such as children, parents, teachers, doctors, journalists, rice traders, mall managers, politicians, researchers and the concerned members of the society, (ii) To share nutritional analysis of selected indigenous Rice varieties and (iii) To explore the market potential of indigenous rice varieties for livelihood enhancement of the farming community

**Brief Workshop Report:**


The Workshop started with warm welcome to the Guest and participants by Mr. Prasant Mohanty; Executive Director of NIRMAN. The Workshop was inaugurated with watering the plant by Mr. R.S Gopalan, IAS; Director to the Dept. of Agriculture and Food Production; Govt. Of Odisha along with Dr. Jafran Keshari Roy; former Joint Director and Renowned Rice Scientist of CRRI; Cuttack Odisha and Mr Natabar Sarangi renowned Organic farmer and conservator of 365 varieties of Rice. Mr. Prasant Mohanty spoke about the need of the workshop at this point of time. He said that Odisha had mega- diversity of Rice. There were more than 30 thousand varieties of rice in Odisha. About 19000 varieties were collected from just Chhatisgarh and Madhya Pradesh by Dr. Richaria. 1600 varieties were found to be high yielding. But over period of time indigenous rice and its diversity is considerably declined. So, it is the high time to conserve

Rice diversity and at the same time to explore marketing of organic Rice for benefits of small and marginal farmers. Already some experiment has already been done in other parts of the country like Karnataka. He sincerely hoped that the deliberations will contribute to the process of conservation of Rice Diversity and marketing of organic rice.

The first session started under the chairperson of Mr. Bhabani Das from SWISSAID. Mr. Natabar Sarangi talked about Rice Diversity of Odisha and his experience in conserving local rice varieties. In his speech, he recounted how Odisha was being the home to 35000 varieties of indigenous rice. Though two-third of India's population eat rice but the rice-diversity has


declined significantly owing to Government's focus on propagation of hybrid rice. He rejected the notion that indigenous varieties give low yield. Now farmers too experience that indigenous varieties at least yield 15-16 quintal per acre in low land, 20 quintal per acre in medium land, 10-12 quintal per acre in upland. As chemical fertilizer and pesticides are not used, the Cost of production is very low, and become a boon for small, marginal farmer and share cropper. The consumer won't have to suffer from the hazards of chemical fertilizer used to produce rice. The environment won't get polluted; the condition of soil will not deteriorate. He cited the example of the states like Punjab, Haryana, Western-Uttar Pradesh where the soil quality has deteriorated to such an extent that they are being advised not to go for rice, but pulses. Now Govt of India is pushing hard to extend the Eastern Indian States like Assam, West Bengal, Odisha to bring second Green Revolution. The Agriculture policy of Govt. of India is influenced by US-Corporate houses. So, we should educate the village farmers to go for indigenous rice. There are indigenous rice varieties which yields 9 ton per hectare, but it is unfortunate that people (planners/ officers) say if we go for indigenous seed and organic farming, how we can feed 1.3 billion people of our country. They too ask where we will get huge organic manure. If a farmer will go for organic farming, in first three years, he will get slight less yield, but fourth year onwards, he will get better yield, as the soil would be enriched.

The basic technique of organic or sustainable farming is to leave 10-15 inch of stalk of paddy with the field while harvesting and that will take care of the health of the soil. From 5$^{th}$ year onwards there will be no pest attack. Cow urine is the best treatment for pest and diseases in plants. Again the yield in indigenous rice is more having second crop of pulses. In pulses, it gives 3 quintal per acre, which costs around Rs.15000/-. We should not compare indigenous rice with hybrid rice per se. We should count the productivity of entire cropping system per unit of land. He shared his experience of being an organic farmer for the last 15 years that organic farming with indigenous varieties of rice is the only answer to save farmer, consumer, soil, water, and environment.

Mr. Syed Ghani Khan, an organic farmer and indigenous rice conservator from Karnataka spoke his experience in conserving 40 varieties of indigenous rice since 1996 to more than 500 varieties till date. When he first involved in rice conservation in 1996 with 40 varieties, he found 2 new varieties in his farm. Two rice scientists documented about the varieties in his farm and published those in local newspaper. He was quite excited to see his work on paper. University of Agriculture extends its support

for documentation of rice, whereas Sahaj Samruddha; a local NGO extended his support for marketing of rice. At present, he has rice varieties having medicinal properties in his farm. His collection of rice variety comes from Odisha, Andhra Pradesh, Keral and Tamil Nadu. Mr. Krishnaprasad, Director; Sahaj Samrudha showed few slides on Ghani's work and expressed how he has inculcated the culture of learning of local bio-diversity among the school children and involved them in collecting data, and also shares seed to neighboring villages.


Dr. Jafran Keshari Roy; former Joint Director and Rice Breeder of CRRI; Cuttack Odisha narrated his experience of being in the charge of collecting indigenous rice varieties and when he left there was 21000 varieties of indigenous rice. He focused on conserving rice diversity, crop improvement and marketing. He also focused on utilization of gene resources with sharing with other farmers. At present, Odisha has total 6700 varieties of indigenous rice which include collection of CRRI, OUAT, NGOs and farmers.

Most of the varieties have been gene crossed over the year due to spread of HYVs, and demand of more food grain production. The major challenge would be global warming, climate change, drought, flood, gene erosion, sustainable food production, and livelihood security. The first green revolution focused on increasing production (Through Fair-Weather Technology) mainly in irrigated areas, and the second Green revolution focused on Food Security for all (Adverse Weather Technology) especially in rain-fed areas. Though the Green Revolution has created self-sufficiency in food grain production but it has side effects like degradation of bio-diversity, environment pollution, deterioration of soil health, and decrease in quality of seed. He expressed his view that overall higher production did not increase livelihood security. He suggested some points to change breeding strategy to enhance livelihood security. Those are

- Development of small farmer friendly HYV under low input/fertilizer condition
- Pure Line Selection (PLS) of important traditional varieties for enhancing yield potential.
- Pure Line Selection and organic cultivation of specific traditional varieties for enhancing yield and quality.

He also praised the current Director of Agriculture and Food Production Mr. R. S. Gopalan for taking steps for registration of farmers' varieties. He visualizes the prospective for market linkage of traditional rice e.g. scented, medicinal properties like high iron and high protein type. He suggested that there should be identification of gene treasuries, unexplored and under explored areas, conservation of the varieties, collection and adoption of modified breeding strategies for development of low-input efficient HYVs for higher adoption and increasing livelihood security. Most important is to encourage farmer and community for conservation of traditional types and better support price for organic/traditional varieties. He made with some concrete recommendations for conservation of rice diversity which is as follows:

1. Identification of widely grown local varieties, for pure line selection for yield enhancement preferably under organic farming.
2. Farmer participatory programme may be widened for rejuvenation and in-situ conservation of traditional types.
3. For achieving actual Green revolution in Eastern India, rice varieties giving higher yields under low fertilizer level and poor soil in rain-fed condition are required.

Finally, he recalled the call of Lal Bahadur Shastriji to leave a meal once in a week when India was importing foods. In same way, he made an appeal, “let us use organic rice once in a week, so that we will create huge demands for organic rice and this will support to the farmers practicing organic farming”.

Mr. Sibaprasad Sahoo of Amhinsa Club, Baragada shared his experience on conservation indigenous variety of Rice. When he talked about cultivation of local variety, people started talking about him a crazy guy. But his efforts are now getting due recognition. His group has been successful in conservation of 75 variety of local variety of rice. He also shared their experience of drought resistance variety of indigenous rice. The local variety of rice has not been affected during drought period in their operation areas. He also highlighted the issue of marketing of indigenous variety of rice.

Mr. Simanchal Nahak of Rushikulya Rayat Mahasabha, Ganjam then shared the experience of hardship of farming community going through in his lifetime. Even minimum support price is not given to farmers for conserving indigenous rice variety and organic produce.

Mr. Ramesh Chandra Naik, shared the experience of NIRMAN working with 167 farmers for conservation of indigenous rice variety in 10 villages covering


2 G.P.s in Nayagarh district since last 3 years. He emphasized there is a common perception that indigenous variety gives low yield but from NIRMAN’s experience indigenous variety with organic SRI gives 18 quintals per acre in average which means 4.5 ton per hectare. He also said that NIRMAN has developed producer’s group and exploring market of organic rice. Recently, it has undertaken nutritional analysis of 5 indigenous variety of rice and found 2 variety has high iron contents. In future, it will support to farmer’s group to link with market of their organic rice and other organic produces.

Mr. Harmohan Patra, an organic farmer from NIRMAN’s field areas shared his experience of conservation of indigenous rice in organic practice. He said he spends less in his farm in compare with farmers doing with chemical fertilizer and pesticides. In addition to this, he gets good amount of yield from pulses because of his organic way of cultivation. There is no medical expense for his family where as farmers practice non-organic way spends a lot in medical treatment. Now seeing my success, farmers of my village are taking local seeds from


me and adopting indigenous rice variety and organic farming.

Mr. R. S. Gopalan, (IAS), Director, Dept. of Agriculture and Food Production, Govt of Odisha, in his speech said that there are indigenous varieties which have potential of high yielding. But we are not giving any attention to local varieties. Few years back, there was an assessment

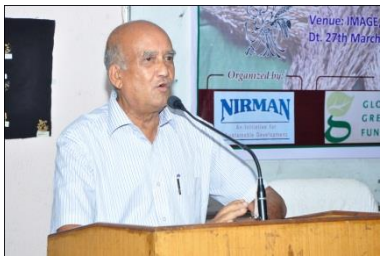
of how many local varieties are available with farmers in Odisha. It was found 700 varieties in Jeypore tracks and 2000 variety in entire state of Odisha. But this indicates the importance of conservation of these varieties. In 2001 Govt. of India has enacted PVC & FRA and created an authority for registration of local variety. Since two years, we have collected and conserved 851 varieties with pure line selection. When a farmer wants to release a variety, the question comes, who is the breeder? For this it needs to go through 63 tests which a farmer can't afford. Even the state government doesn't have research facilities for all 63 tests. So, it is easier for farmers to go through PVC &FRA for registration.

The basic approach of scientific research is to have "Open Mind" which is lacking today among scientists. There is lots of scope to research on Desi Variety. Our scientists should have open mind about desi variety. If Desi variety is better, then our scientists should admit it, but their attitude is not encouraging. We have to change this attitude. If any farmer wants to access rice seeds conserved under PVC & FRA. Then, he will surely get it but with a condition that he has to refund equal amount seed after the harvest. We have 851 nos. of applications pending with Plant Variety Conservation and Farmer Right Authority (PVC & FRA). But for some reason, they are not yet registered even one of those. We apply it in the name of a farmers' group of 10 people. If any royalty comes out of it in near future, then let the farmers get that, not the Govt. But the drawback with the Act is the validity of registration is only 15 years. If a desi variety is having the characteristic of being drought resistant, then a MNC will wait for 15 years till the validity expire, then take it by its name. So, the validity should be extended to indefinite period. We do not seek copy right but due recognition that this seed variety belongs to the State of Odisha. If someone wants to take a gene of it, then with due recognition, it will do. If someone wants to derive commercial benefit out of it, then the share of profit should come to the farmers' group. So this type of change we want in the Act, Rules and in entire aspect. We will collect more Desi variety from farmers, collect and popularize it. We are planning to research on the special characteristics of desi variety. We are trying to institutionalize the process. So, change of person will not affect the work. I pray the cooperation of all the farmers and wish all the success of this workshop.

Mr. Bhabani Das from SWISSAID summarized and shared the observations of this session that Mr. Natabar Sarangi and Mr. Roy all talked about yield. Whether yield will increase or decrease, it will all depend upon how extensively the soil has been used. In Punjab, the soil has been used extensively, and the moment they switch over to organic, the production will go down. But in case of tribal areas, where the soil is not much used to chemical fertilizer, in switching over to organic, the yield will not go down, rather it will enhance the production, the micro-bacterial activity will increase. The technology and science is fine. But, commercialization of technology is dangerous. To address iodine deficiency, iodine salt was promoted and the price has gone sharply high and few companies simple benefitted. This kind of situation has come to agriculture as well. We need to keep vigilant of the development. Mr. Bhabani highlighted budget allocation of revival of agriculture after green revolution in Punjab. Without taking into account of learning of first green revolution, Govt. launched 2nd green revolution in eastern India states.

Mr. R. S Gopalan analyzed the agriculture in GDP. He opines that in 2011 Agriculture and Allied sector contributes 15% to GDP, whereas in the same year 55% of populations depend on that sector. So it is clear that to every 100 rupees, 15 rupees go to that 55% of population and the rest 85 rupees go to the 45% of the population. It is asymmetrical. Agriculture is not at all profitable. Thus, either GDP of Agriculture should be correspondingly high or the population in Agriculture should be correspondingly low. But it is no longer economics. If we

take only raw Agriculture in the same year, only production side excluding Fishery, and the allied sector e.g. all the packaged food you see in the supermarket, Pepsi, chips, the contribution of Agriculture sector to GDP is even less. In 2011, the total production of paddy was 15 crore ton which values 162000 crores and production of wheat was 8 crore ton which values 96000 crores ruppes. So, the total value of paddy and wheat production was Rs. 258 thousand crores whereas that time 30 crore people were involved in production of Paddy and wheat. At that time, the total GDP of India was 1 crore crore, so basically 3% of GDP goes to 30 crore people. This is the inequality. He said that unless we don't extend MGNREGS, food subsidy through PDS, then it'll lead to serious situation. The first session was closed with lunch break.




Ms. Anjali Patnaik wants to know on pure line selection. But prior to next session, Mr Shishir Parija explained it. He explained only a plant has the ability to prepare its own food using the natural resources like soil, water and Air. But all other living beings directly or indirectly depend upon plant for their food. Plant receives the amount equal to 95-98% of its weight from the air e.g. carbon dioxide, oxygen etc. So only 2-5% it depends upon soil for its growth. So, it is not understood why people talk about chemical fertilizer. And even after switching over to organic, the yield will not decrease. The farmers need not to wait for 3 years for the yield to increase. It will be sheer loss for him. Even after switching over to organic he will get in the very first year as much yield he got last year. It is possible if in the first year itself we will increase the microbial activity of the soil through organic measures, then the yield will not decrease. Now coming to the question asked to hir on pure line selection, he said that he has found an easy method of doing that. He said that all grains are not seeds, though all seeds can be grains. Just pick healthy dhan kendas(panicles ) and then only take upper one-third portion that are good for seeds.


The next session was facilitated by Mr. Krishna Prasad. He distributed one sheet to each participant to write down their name, contact no, rice variety they are conserving, special characteristic of the variety, then those cards were collected. Mr Debalu from "Sanjibani" an organization working in Araku Valley, Vishakhapataam, A.P. shared his experience of conserving rice variety and other crops like millet. Since 2000, he has been working in those areas which are close to Nandapur of Koraput District. They used to do total documentation of characterization of crops. Through his documentation, his community was able to receive an award of 10 lakh rupees from PVC & FRA; Govt of India. They are able to market their products. They are sending their products to organic outlets in Vishakhpatnam. Kisan Bazar in Andhra pradesh and they have linked up the farmers with market. It started with 2 farmers in 2000, now reaches to 450 farmers and their weekly turnover is 6 lakh rupees. So now NIRMAN is taking the market initiative, and he wishes all the success to the farmers.

Mr Krishna Prasad said that in every workshop the warmth of the discussion lost its spirit in due course. If we all sit here, then some concrete result should be achieved by the farmers. Only conservation of seeds will not yield profit to the farmers. It is possible only when we link farmers' product to the market e.g. Rice Mela at the State level or interstate level can be organized. The rice will be branded as per his specific characteristics, like diabetic rice, rice for khir, etc, so that the marketing will be easier. He suggested the farmers to plan seriously

to sustain the Agriculture. He then showed slides on different varieties of rice grown in Karnataka. There are different varieties of rice, like deep water rice, salt water rice, and scented rice like Odisha. There is a culture of rice. There is also cultivation of rice and pulses, rice and ragi, rice and jowar together. He showed the slide containing the photograph of deep water rice, the variety which can withstand itself for more than a month in deep water during the month of rainy season/in the month of June and July/ during flood. There is a mythology behind a deep water rice variety named "Nareguli" which is said to get all the powers of Nandi to survive in flood water. And this can be linked with the marketing strategy; consumer may feel happy to buy such variety. So, let the rice variety grow without any pesticide, chemical fertilizer. Like the salt water resistant varieties exist in Konark-Puri site of Odisha and in Goa, there are salt water resistant varieties in Karnataka too. Sahaj Samrudh has been able to map 360 varieties of rice, out of which 131 varieties are not available with the farmers now. Then he gives the example of two farmers Ghani and Rajapa from Andhra Pradesh. In Karnataka, 50 seed savers are identified, who supply quality seed to the Government, NGO, organic farmers throughout the state. Each farmer is having 30, 50 and 60 varieties with them. Each variety is unique.

We have a range of different farmers. e.g Nandish is a lazy famer but doing easy farming. Today's young generation needs easy methods for doing farming. That is why Sahaj Samruddha not only promotes organic farming but also different organic practices. Nandish came with green manuring the soil with 100 varieties before doing paddy. And now he is getting 32 quintals per acre. He has not to do any weeding; this is a record production recognized by the Bangalore University. Govt. of Karnataka has sent him to different countries like German, and Korea. Knowledgeable farmers are supporting other rice savers. The problem with the Odisha farmers is they are not collecting quality seeds. There is lot of choppy seed with their seed storage. In Karnataka, a group of farmer trainers who are knowledgeable in this area go to farmers' field and help them collecting quality seeds from the field. So it is participatory. Then he talked about his experience in marketing the products. At first, they supplied the products to big companies. But they get only 5-15% of premium. So, he sat with the farmers for calculation. If the farmer gets less than 20 rupees for 1 kilo of paddy, then selling rice is not profitable. So many farmers shifted to cash crops in Karnataka. That is why they started their own marketing company "Sahaj Samruddha Producers' group with the brand name Sahaj Organic. It started with investment of only 2 lakh, now it reaches 14 lakh. In that Producers' company farmers are the shareholder. But they do not know how to do the business, so they appointed someone as the CEO paying him 32000 rupees per month. He runs the show. There are 50 different organic sellers at Trivandrum, Chennai, Hyderabad. They were brought together under the banner on Organic Sellers Network. They first sell in their city and the excess amount goes to the other city. They procure not in a small amount atleast 5 quintals or 10 quintals at one time, otherwise it is not economic viable. For small requirements they never go there. They search for people who have more money. As People who are in software companies have more money, they opened outlets in Infosys, Wipro etc. Along with rice, though we do millets, vegetables etc. but our major focus is rice. Like preparing a bride, we should prepare our produces for selling. In the rice melas all the media people published the rich diversity decorated in different pots. They have never seen before such rich diversity. Books also published on medicinal properties of rice. They have also displayed the nutrient contents of different varieties in a chart, in the last row there is mention about chemically grown high yielding variety. Sona

masuri which is having low dietary fibers, which is not good for health. It is a method of educating the consumers. Most of the people in Hyderabad and Bangalore eat more Pizzas, parathas, Breads and suffers even for 3 days not having motion. Wheat grass powder cures constipation. And they are ready to pay more prices for it even 20,000 rupees. The lab analysis shows the different characteristics of rice. There are rice varieties which contain more iron, which is good for pregnant women. This is a remedy. They have done lab analysis of 40 varieties as it costs nearly 3000 rupees for each variety. So without doing lab analysis, without having good photographs, enough materials with you do not go for marketing, that confidence you must gain first. The problem is People organize mela without doing preparatory work, good photographs etc. In Dharwad, a rice mela is going to organize on 24th April. Sometimes bring some celebrity while organizing a mela, so that there will be good media coverage. He wants to cooperate with Odisha farmers to do such type of marketing.

Mr. Bhabani Das from SWISSAID spoke that the problem is that In Karnataka, in places like Bangalore, and Mysore, the people from different states reside there. But in Odisha there are no big cities except Bhubaneswar, and Cuttack. Though many people live in urban areas, yet they are having their native village, rice and black gram come from own farm at village. So, we can't depend upon 100% on market. In Bhubaneswar itself, 50 % people are having land at village. The situation in Odisha is completely different. The Govt is supposed to buy. There should be negotiation with the Govt. for intervention. How the govt will procure and distribute that is a different issue. In Odisha, Govt is the biggest buyer, Market has a very small role to play in Odisha. Recently there was a meeting at XIMB, where the personnel from NABARD says that if we induce a farmer to go for organic, then the risks are associated with it. Even if there is pest attack he can't use pesticide. So, will there any mechanism evolve, where the Govt will procure organic rice from the farmers? There was response from participants that what is Bhubaneswar 10 years back is not the same now. So, the situation may change in near future too. Only Bhubaneswar in Odisha is having Airport, but in all other states, like AP and Maharashtra, there are 3-4 airports. Only Bhubaneswar attracts cosmopolitan people. Even if people from different districts of Odisha want to settle down in Bhubaneswar, we can't replicate a situation like Bangalore, many IT companies are there. If the Consumer is paying 4x, then the farmer is getting x. In a city to have a rented shop is more than that of a person's salary. So what % of premium a farmer will get.

One of the participants asks if there will be farmers' cooperative, then the inward expenses is less and the big share can directly go to the producers. And mela is needed to initiate the programme, to popularize the produces. And I think NABARD has that provision to support such kind of mela. Mr. Bhabani Das from Swissaid said that even Mr. Krishna Prasad was talking about premium, only 10-15% the farmers are getting. And in organic, the cost of transaction is so high, the production is scatter, and the demand is scatter. If the Consumer is paying 4x, then the farmer is getting x. If that situation will persist, then it is difficult for the farmers to sustain with organic practices. So, should farmer rely on Market or Govt? To this discussion Mr. KP suggested that even in Bhubaneswar other linguistic people are residing. So through mela, lets initiate, if people will not come to the mela, then we can think of other strategy.

Mr. Praveen from ASHA talked about the need of doing a mela. He said that first of all a mela is organized, so that a producer will get direct benefit, and secondly more awareness, and third is the

publicity. As the farmers do not have marketing skill, we assist them. We formed Marginal Rice Producers' Association. The farmers fix the price, we only take 10% commission. The other expenditures are borne by the Association. We mainly concentrate on Red rice, Medicinal rice, Diabetic rice and Black rice. We first identify the rice variety grown in a particular area and the farmer who is growing this. Then we ask that person to come with bulk and we execute the mela. In 1st day, there is publicity of these varieties. The mela continues for 4 days. Within 3 days all his produces are sold. It is because of the publicity and advertisement we do. We do the stage banner very simple. But the entrance get banner attracts most of the customer. We make invitation card with all the details about the mela, and invite a famous personality to inaugurate. In Hubli city, every Friday the Swamiji, the famous spiritual personality discuss with 10 to-15 thousand people. And in that city the rent of a shop is at least 4000 rupees. But that Swamiji gave us free of cost to open an outlet. Also they invited the Kannad Film star Malgudi Days famous Ramesh Bhatt. As soon as people enter to the mela, we displayed all the information like in which stall, which variety is available, so that consumer can directly go to that shop. We provide in printed and sticked to the packet the detail of the variety along with the cooking tips. The specificity of this mela is all organic and all traditional varieties. Like red rice for Dosa, Black rice for making sweets, and Rajmodi for sambar-rice.


Concluding session was facilitated by Mr. Prasant Mohanty and he said that we learnt the experience of marketing of organic Rice from Sahaj Samrudh, Karnatak. It took 4 to 5 years to experience the success. Most of the time workshop gets over with some declaration or after a very good deliberation without any concrete action plan. But we need to have concrete plan of action plan like Rice Mela or Organic Mela etc. We have hardly introduced organic farmers with consumers. May be this kind of program will provide platform to organic farmers to sale their produce and get better price of it. We need all your suggestions. Mr. S.K. Das, Mr. Shibprasad Sahoo and Mr. LDS from XIMB supported and suggested to organize Organic Mela at Bhubaneswar. Mr. Krishna Prasad asked the participants when we'll organize it ? Few participants suggested after harvest i.e. January, 2014. Some suggested within next 6 months. Krishna Prasad suggested earlier was better to organize the Organic Mela. Then it was decided to organize a Organic Mela in next 2 months at least in the end of May or early June 2013.

Mr. LD Swain from XIMB suggested selecting central place with some govt. institute like Redcross or some other places for the Organic Mela, so that more visitors will turn up and secondly we need less resource for this. He also said that it should be more than one day and all type of media should well mobilized to draw consumers and common people to the Organic Mela. He volunteered himself to extend support required for this program. It was decided that the working groups will meet in May, 2013 and draw detail plan of action and share responsibility. An invitation letter will be sent to the NGOs and Groups interested to jointly organize the program. The workshop was ended with vote of thanks by Prasant Mohanty to the Guest and all the participants i.e. organic farmers and seed savers, civil society groups, scientist etc.

**Rice Exhibition:**

There was exhibition of more than 1200 variety indigenous rice variety by farmers and NGOs and Govt. of Odisha in the outside of the conference hall of IMAGE. These varieties were brought by NIRMAN, Sahaj Samrudh, Sanjeevani and Amhins Club and State Seed Testing Laboratory, Agriculture department of Govt. of Odisha to display in the exhibition.

## Photo Gallery of the workshop on Rice Diversity and Marketing of Organic Rice



Brief outcomes are that (i) stakeholder and consumer were better aware of safe food and got familiarized with local rice variety and nutritional value, (ii) process awareness to conserve local rice variety at farmer level, (iii) discussed on competitive performance and cost-benefit of natural (traditional) and engineered varieties and (iv) sensitization and responsive participation of government, non-government and research houses and all other stakeholders

**Financial Report:**

Total Rs.2,26,959/- has been utilized, out of Rs. 2, 19, 987/- project sanctioned amount and interest amount of Rs.6,972.07.

**Future needs:**

Producer group needs to be strengthened for business operation and management on their own. It needs 2-3 years time to develop the farmers group to full-fledged operation of producer group. This would create a model of conservation based livelihood enhancement. Another important direction is successful linkage of consumer groups with producers which benefits both the stakeholders.