

HYBRID RICE IN ODISHA: WHAT'S IN IT FOR ODISHA'S SMALLHOLDERS? Report of a Fact Finding Visit of ASHA to Bhawanipatna District¹

Odisha boasts of a vast diversity of rice varieties and the legendary story about Lord Jagannath in Puri being worshipped with a new variety of rice every day of the year is illustrative of such diversity. The famed Jeypore tract, considered to be the origin of *Oryza sativa* is located in this state and rice is an integral part of Odisha's life and culture, especially in its countryside. Central Rice Research Institute (CRRI) is also located in Cuttack, Odisha.

"BRINGING GREEN REVOLUTION TO EASTERN INDIA (BGREI)"

In 2010-2011, Government of India launched a new programme using a separate Rashtriya Krishi Vikas Yojana (RKVY) stream of funding called "Bringing Green Revolution to Eastern India". A lot of emphasis was placed especially by the Union Minister for Agriculture, Government of India, on hybrid rice being the main vehicle for this green revolution. There was talk of emulating the "Chinese Model" here and it was obvious that intensification of an external-input-driven model of farming was what was on the cards from the beginning.

Odisha is one of the seven states where the Government of India's initiative on "Bringing Green Revolution to Eastern India" is unfolding since 2010. In 2010-11 it received 79.67 crores under the BGREI and showed a 94% utilization. In 2011-12, by September 2011, Odisha received 31.31 crores of its 62.62 crores budget, with a 50% utilisation. Odisha's share has been 17.04% out of a total budget of 835 crores for BGREI in the two years since this initiative began.

Odisha had focused on crops like paddy, sugarcane, maize, mustard and sunflower in this initiative, with promotion of particular production technologies as the main thrust. In the first year (2010-11), Odisha had proposed "popularization of hybrid paddy in PPP mode" with an outlay of 8.32 crores in the project. In the revised plan however, this was dropped. On the other hand, 8.20 lakh rupees were spent on Hybrid and HYV Paddy minikits were spent under RKVY. That was in 2010-11. There was also an emphasis on System of Rice Intensification for yield improvement with targets of demonstrations on 10 acres of land in each Gram Panchayat involving 25 farmers, with an outlay of Rs. 13000/- per acre, with a total budget of 5.97 crore rupees.

By the second year, 2011-12, GoI issued guidelines, which emphasized technology promotion in 391 compact blocks of 1000 hectares each, with a priority accorded to non-NFSM districts. This BGREI initiative, as per the guidelines of the Government of India, mainly focuses on increasing rice and wheat productivity including through the

¹ ASHA (Alliance for Sustainable & Holistic Agriculture) is a large national network of more than 400 organisations that had come together in 2010 for Kisan Swaraj Yatra, to save our Food, Farmers & Freedom. This note was prepared by Kavitha Kuruganti, Ananthasayanan and Sayani Hazra. This report also has a Note by Dr Debal Deb, Centre for Inter-Disciplinary Studies on 'Folk Rice Varieties Vs. Modern HYVs & Hybrids'.

promotion of hybrid rice, as one of its major thrust areas. Incidentally, CRRRI is the designated nodal agency for BGREI. "Science-led development is the key to success" screams a slogan by the JS-Crops, GoI. GoI roped in IRRRI for demonstrations and crop monitoring, while drawing in ISRO for crop monitoring.

Targets were set for number of demonstration units and for Odisha, it was 44 rice units in all, including 5 hybrid rice units. Presentations made on the benefits of hybrid rice project reported/claimed the following results: 20-22 effective tillers per plant for hybrid rice, as against 9-11 for control; 210-230 grains per panicle for hybrid rice as against 90-100 for control and an expected yield of 33.6 quintals per acre with hybrid rice while the 'control' rice is expected to yield around 21.8 quintals per acre (Presentation by Joint Secretary-Crops during National Conference on Agriculture for Rabi Campaign 2011 on September 14th and 15th 2011)².

The promotion of hybrid rice is happening through National Food Security Mission (NFSM) also. For instance, in 2011-12, Odisha had 10,770 numbers of Integrated Plant Protection, SRI and Hybrid Rice demonstration sites. The total NFSM budget for Rice was 35.97 crores.

RKVY & SOME RICE-RELATED PROJECTS IN ODISHA

The Government of Odisha has been using certain strands of support available under RKVY (Rashtriya Krishi Vikas Yojana) for its rice-related interventions. While some projects fall under BGREI, others don't but have their bearing on rice future of the state. Some information about these projects in 2010 and 2011 is given below:

Distribution of hybrid paddy minikits during Kharif 2010 (ID: OR/RKVY-CROP/2010/210): Distribution of 4525 Minikits of hybrid paddy was the objective of this project. 2516 Nos. of Swarna sub-1 (1 Kg. each), 500 Nos. Ajay and 500 Nos. Rajlaxmi (2 Kg. each) were distributed. Minikit field trial was conducted. Increase in the yield of paddy by popularising the hybrid paddy seeds among the farmers was stated as the expected outcome of the project. It was reported under the "Outcome" of the project that "trial results convinced the farmers with respect to Hybrid Paddy Seeds and submergence tolerance of Swarn Sub-1". The outlay was 8.20 lakh rupees.

Popularisation of hybrid paddy in PPP mode (ID: OR/RKVY-CROP/2010/203): Categorized as an Innovative Scheme, under Macro Management of Agriculture (MMA) and to be implemented by the Directorate of Agriculture till 31/10/2011, this project had an outlay of Rs. 8.32 crores, meant to be taken up on 14,760 hectares during 2010-11.

The Expected Output of this project was stated as: "Additional financial return of Rs.25,000/ha", and an Expected Outcome of "Increase (in) the production and productivity of rice by popularisation of hybrid paddy cultivation through PPP mode".

Popularisation of Hybrid Paddy through SRI during Rabi 2010-11 under PPP mode (ID: OR/RKVY-CROP/2010/183): Approved under Crop Development, and

² <http://agricoop.nic.in/rabi11.htm>

classified under Macro Management of Agriculture (MMA) scheme, this is a one-year project to be implemented by the Directorate of Agriculture with 30,000 beneficiaries on 14760 hectares with an outlay of Rs. 8.32 crores. No completion report is available.

System of Rice Intensification (ID: OR/RKVY-CROP/2010/076): This project, with a target of covering 20204 hectares under System of Rice Intensification has an outlay of 5.96 crores. Starting from 2007-08, Odisha government has been having one or the other project focusing on SRI. In the case of the project taken up under BGREI in 2010, the Expected Output states thus: "By practicing rice cultivation through SRI the production is increased by 40 % over conventional method". Under Expected Outcome, "SRI is the combination of best practices. Scarce water resources can be properly utilized by covering more area with limited quantity of water. Again SRR will be increased since seed requirement in SRI method is reduced by more than 90%. Simultaneously better soil health is ensured". It was reported that in the 2007-08 project, 47% yield improvement was achieved and in 2010-11 project, a 43% improvement.

Establishment of Gene Bank for Preservation of Farmers' Varieties (Local Paddy) (ID: OR/RKVY-CROP/2011/233): This project, approved in the 8th State Level Steering Committee meeting, has an outlay of two crore rupees for 2011-12. This project has been classified under the National Food Security Mission is expected to end by 31/1/2012.

Source: <http://rkvymis.dacnet.nic.in>

THIS FACT FINDING REPORT ON HYBRID RICE

A fact-finding visit was taken up to some villages in Bhawanipatna district to look at hybrid rice promotion by the government and the general adoption and issues around hybrid rice. This fact-finding visit was organized by Alliance for Sustainable and Holistic Agriculture, with Living Farms and Chetna Organic, on 13th and 14th of November 2011. The following is a report from this fact-finding, with some background information on hybrid rice promotion and spread in Odisha. Before moving onto Hybrid Rice, it is pertinent to give some background information on Odisha's agriculture, landholdings, tenancy, rice cultivation and procurement situation etc., since all of these have their own bearing on Odisha's farmers and their adoption of hybrid rice.

Odisha's Agriculture & Rice Cultivation

The State has about 64.09 lakh hectares of cultivable area out of total geographical area of 155.71 lakh hectares, of which net area sown is about 60.18 lakh hectares³ (2009-2010). Agriculture contributes to about 20% of the Gross Domestic Product of the State. It provides employment, both direct and indirect, to about 64% of the total workforce.

The State is divided into four Zones, viz. (i) the Northern Plateau (ii) the Eastern Ghat zone (iii) the Central Table lands and (iv) the Coastal zone. On the basis of climate, soil,

³ Annual Activity Report, 2009-2010, Department of Agriculture, Govt of Odisha (<http://www.Odisha.gov.in/agriculture/>) and Odisha State Agriculture Policy 2008

rainfall, topography and cropping patterns the State has been delineated into ten Agro-Climatic Zones: North-western plateau, North-central Plateau, North-Eastern coastal plain, East and South-Eastern coastal plain, North-Eastern Ghats, Eastern Ghats highland, South Eastern Ghats, Western undulating zone, Western-Central table land and Mid-Central table land.

As per the Status of Agriculture 2008 report (GoO), 29.14 lakh hectares of cultivated land is high land, 17.55 lakh hectares is medium and 15.11 lakh hectares is low land (<http://www.agriorissa.org/informations.aspx>). The Gross Cropped Area is 90.09 lakh hectares reflecting a cropping intensity of 160%. Within the cultivated area, paddy occupies around 44 to 45 lakh hectares out of a total crop area of around 58 to 59.5 lakh hectares (Economic Survey, Odisha, 2009-10). The following is the picture of productivity of rice in Odisha in kilograms per hectare.

Year	Rice	
	Kharif	Rabi
1980-81	1003	1571
1990-91	1156	2019
2000-01	987	2136
2001-02	1554	2127
2002-03	690	2352
2003-04	1459	2112
2004-05	1401	2230
2005-06	1504	2193
2006-07	1498	2328
2007-08	1658	2484
2008-09	1477	2488

Source: Status of Agriculture 2008, Government of Odisha

The above table clearly shows that Kharif cultivation of rice, which is mostly rainfed, has fluctuating trends when it comes to yields (14 to 16 quintals, while in some years affected by drought, it was less than half of this) whereas the rabi crop (irrigated) is more or less stable at 21 – 24 quintals per hectare. Based on the productivity levels of different districts (2008-09) in the case of Rice, the districts have been grouped into 4 productivity levels, as presented below:

Productivity group (quintals/ha)	No. of districts	Name of the districts
High Productivity (>19 q)	5	Bargarh, Bhadrak, Jagatsinghpur, Sambalpur, Sonepur
Medium Productivity (15-19 q)	7	Dhenkanal, Ganjam, Jajpur, Jharsuguda, Koraput, Mayurbhanj, Rayagada
Low Productivity (13-15 q)	13	Angul, Balasore, Bolangir, Boudh, Cuttack, Kalahandi, Kandhamal, Kendrapara, Khurda, Keonjhar, Nayagarh, Nuapada, Sundargarh
Very Low Productivity (11-13 q)	5	Deogarh, Gajapati, Malkangiri, Nabarangpur, Puri

Source: Interim Report, State Farmers' Commission, Odisha (2010)

The five High Productivity districts (out of 12 which are above state average), fall in the agro-climatic zones of central table land, Eastern and South Eastern Coastal Plain and the 'very low productivity' districts are parts of North East Ghat, South East Ghats and North West Plateau. These districts are also ones which have more irrigation facilities.

When it comes to the **cost of cultivation of paddy**, as per official figures, it has moved up to Rs. 599.68 per quintal in 2007-08, from Rs. 468.35 per quintal in 2003-04, showing steady increase. Over the years, it has been seen that the Minimum Support Price (MSP) announced just about covers the cost of cultivation leaving very little margins for farmers.

In terms of **procurement** by various government agencies, since 2000-01, just about 17.53% to 28.74% (in 2006-07) of the total produce has been procured (Odisha Agricultural Statistics 2006-07, Directorate of Agriculture & Food Production, Govt of Odisha). The rest is mostly consumed locally or sold in informal markets. Odisha's nebulous agricultural markets reflect a picture wherein, if there is any systematic market support with government oversight at all, it is on this little proportion of paddy that is procured by various agencies. The small volumes of production from individual farmers without any aggregation at a collective level is also a reason often-cited for this state of affairs. Like elsewhere, there is also a ceiling to the quantity procured from each cultivator, on a per unit of land basis.

It is also pertinent to look at **irrigation in Odisha's agriculture**. Out of the cultivated area of 61.80 lakh hectares, 33% is irrigated and 67% unirrigated in Kharif, 2007-08. In 2004-05, the total irrigation potential created is about 39.3 lakh hectares (Kharif 26.65 lakh hectares and Rabi 12.66 lakh hectares), but only 68% of it was utilised (GoO, 2006). The important crops under irrigation are vegetables (43%), *paddy* (39%) and spices (22%) during Kharif and paddy (100%), sugarcane (100%), other cereals (93%), spices (69%) and vegetables (64%) among others during Rabi.

When it comes to **landholdings**, the numbers of holdings in Odisha are increasing, while the area is decreasing. The number of marginal and small holdings are on the rise, including the area that they collectively hold (46.6% of area in 1990-91, which increased to 53.1% in 2000-01 amongst 83.8% of landholders), indicating a decline in the earlier inequalities across size-class in terms of operational landholdings. By 2006-07, the per capita availability of cultivated land was 0.13 hectares (compared to 0.39 hectares in 1950-51), as per Status of Agriculture 2008, GoO, while the average size of landholding was 1.25 hectares.

It is also important to note that **tenancy** is on the rise, though not recorded officially, which means additional vulnerabilities of the real cultivators, since many are not covered by institutional sources of credit or insurance or marketing facilities.

In terms of **farm inputs**, Odisha has witnessed a 66% increase in the use of chemical pesticides during 2004-05 and 2008-09 (from 669 MT of technical grade material to 810.75 MT, as per Status of Agriculture 2008 report of the Government of Odisha). When it comes to chemical fertilizers, the average use per hectare has moved from 43

kilos in 2004-05 to 62 kilos in 2008-09 (Economic Survey, Odisha, 2009-2010).

Another aspect to be highlighted here is **Odisha's vulnerability to disasters**. As can be seen from the table below, there is no year when some part or the other of the state is not affected by some disaster or the other! Further, the scale of the disaster is also quite high in many years as is apparent from the number of blocks and villages affected. Agricultural Statistics 2006-07 has the following picture to give on the year-wise number of villages which incurred crop loss of 50% and above since 1999 to 2006, during Kharif.

Year	No. of affected Districts	No. of affected Blocks	No. of affected Villages
1999	18	142	18875
2000	29	216	16857
2001	12	43	1625
2002	29	287	32659
2003	9	65	3175
2004	10	40	1615
2005	6	33	1706
2006	26	224	16248

It is therefore very important that Odisha's farms be designed for resilience in addition to tolerance to different kinds of stress in terms of seed varieties used etc.

ASHA believes that hybrid rice promotion in the state of Odisha cannot be assessed or looked at without the above background in mind.

ASHA'S FACT FINDING VISIT

On 13th and 14th November 2011, Kavitha Kuruganti (Convenor, ASHA), Ananthasayanan (Safe Food Alliance), Ratnakar Sahoo (Organic Farmer from Bolangir District, Odisha), Bichitra Biswal (Living Farms, Rayagada), Akshay Kumar Sahu, Gobinda Mohapatra, Md H Zzaman (all from Chetna Organic, Kalahandi district) went into villages of Bhawanipatna block to speak to farmers who were beneficiaries of the state government initiative to promote hybrid rice, along with other farmers who had opted or not opted for hybrid rice cultivation. We visited Sardarpur village, Medinipur village and Manoharpur village, in addition to Kalam village, to find out about farmers' experiences and views with regard to hybrid rice.

The team also met with Pradeep Sahoo, a seed dealer in Bhawanipatna town. Through him, we got to know that 30 tonnes of hybrid rice was sold by dealers in different blocks of Bhawanipatna district. At a seed rate of 6 kgs/acre, this means 5000 acres (2000 hectares) of hybrid rice through private market channels. Against 1.96 lakh hectares of paddy sown in the district in Kharif 2011, this indicates an adoption level of just around 1%. The number of companies and brands was quite long however – Bayer, JK, Indo-American, Nirmal etc. There must be a good reason why farmers are not gung-ho about this seed, even though the government is making plans for importing the "Chinese Model" into India in its Green Revolution plans.

Pradeep Sahoo, the seed dealer informed that average yields of hybrid rice ranged between 25-30 quintals per acre. When it came to seed prices, while hybrid rice costs around Rs. 350/kg (with a seed rate of around 6-7 kilos per acre that works out to Rs. 2100/- or so per acre), high yielding varieties' seed is available Rs. 700/- to Rs. 1000/- per acre, he said. It was also pointed out that chemical fertilizer use was higher in hybrid rice. Further, since there is breakage of grain in regular mills in the region, such (hybrid) rice is processed in sheller mills in Chattisgarh, we were told. He also told us that weedicide usage (pre-emergent) is going up in the area and hybrid rice cultivators use these chemicals.

In Sardarpur Village, we interacted with Chitra Sen Sa (15 acres), Jogeshwar Sa (25 acres) and Payodhara Sa (12 acres), amongst other farmers. While two of them grew KRH-2 Paddy Hybrid supplied by the government, Payodhara Sa cultivated Arize 6444, a private brand. All the three farmers have irrigation facility from the Bhatangpadar dam.

- : Chitra Sa reported that out of the 2 kilos given to him by the government agencies, only one kilo seed was good. The other kilo seed did not germinate, he informed. He had sowed the good seed in ½ an acre. He got 3 quintals yield. This year, no seed was given though he requested for it. When asked why he wanted more seed despite problems with the seed quality and the yield not matching up to expectations, he informed that the market price of this paddy is higher, given that it is fine rice. The other rice varieties that he grows including Swarna, 1001, Hassan Choodi, Jholiya Menju etc., do not fetch the same price. This is the only rice that he sold in the market last year (hybrid rice is not preferred for consumption by these farmers since "it has no taste" and "it does not give strength"). One acre of Swarna (a HYV) yielded 24 quintals last year. He also reported that he used the same quantity of chemical fertilizers on both the HYV crop and the hybrid rice crop. He used two quintals of DAP and Urea in all (one quintal each) at the cost of Rs. 2010/- and could not use any Potash since there is no availability of the product.
- : Jogeshwar Sa reported that in his experience of one year of hybrid rice cultivation (he grew it only once so far, which is last year), the difference in yields between hybrid rice and local varieties is as high as ten quintals per acre. When asked whether it came true in his case, he said that there were problems with rain and therefore, there was a yield reduction. He said that with aberrant rains, the yield reduction in hybrid rice could be upto 25%; in Swarna paddy, a window of at least a fortnight exists when rainfall variations take place. He informed that given that line sowing (and not broadcasting) is taken up for hybrid rice, agri-labour finds it more convenient. He had not gone in for hybrid rice this year because there was 'no free seed distributed' this season. He also said that animals don't like the straw from hybrid rice and prefer local varieties; he also informed that the farmers also do not consume hybrid rice and it is only meant for the market. He himself consumes only desi because of better taste. In the discussion related to costs and yields he concluded that "hybrid rice is more risky" and not suitable for unirrigated farmers.
- : Payodhara Sa is a farmer who went in for a private hybrid this year but had to transplant somewhat late given the delayed rains. He felt that labour charges are lower by at least Rs. 500/- in hybrid rice. HR had less tillers than desi, he said.

However, seed cost was doubly higher, at Rs. 4800/- for his 3 acres of hybrid rice, compared to Rs. 2400/- for Swarna on 3 acres. He however has heard that during milling, rice recovery from desi paddy was upto 50% while for hybrid it is only 25%.

In Medinipur, we spoke with Choodamani Sahu who had opted for hybrid rice for a second successive year this season. He had sown 10 acres of hybrid rice belonging to different private brands, expanding from one acre of hybrid rice last year. He reported that last year, he got 30 quintals of yield from one acre of hybrid rice while Swarna yielded 25 quintals and "1001" gave him 22 quintals per acre. Cost of hybrid seed worked out to be around Rs. 1600/acre while for Swarna, it is around Rs. 400/acre. In terms of chemical fertilizers, he uses at least ten kilos more of DAP in hybrid rice. He predicted that in time, there will be greater adoption of hybrid rice by farmers in his village given higher yields with this seed. He admitted that while he has not used hybrid rice produce for consumption in his own house, he will opt for a scented hybrid next year for household consumption.

When we worked out the cost of cultivation of hybrid rice and Swarna variety of this farmer, we found that transplantation cost in Swarna was higher, while several aspects related to hybrid rice cultivation were higher (seed cost, chemical fertilizer, plant growth hormones, harvesting etc.). The cost was at least 1400/- rupees higher with hybrid rice; if Swarna seed is farmer-saved, this would be nearly Rs. 2000/- rupees.

We were told that several farmers in neighboring Manoharpur had adopted hybrid rice, even if only in little areas. In Manoharpur, we met with Krishna Chandra Biswal and his wife Samyukta Biswal. They have 7 acres of land (with canal irrigation as well as dug well as their sources of irrigation) and had devoted 4 acres to hybrid paddy this year ("Karishma" of Nuziveedu). They had heard that hybrid paddy seed might give more yield and therefore opted for this seed. However, the couple feel that their crop will yield not more than 15 quintals per acre, while Swarna would have yielded 20 quintals. Their expenditure on seed was nearly Rs. 2000/acre while on Swarna (which is replaced once in 3 years or so), it would have been Rs. 400/-. They also used two different herbicides on their paddy. Another farmer called Bagru Biswal, who had sown hybrid rice in 3 of his ten acres was a very unhappy farmer. He reported that hybrid rice requires more care and is more prone to pest and disease attack, right from the nursery stage. Jagbandhu Podh, who has only 4 acres of leased land, had sown all his 4 acres with private hybrid rice seed, by spending nearly 2700 rupees per acre. He reported that there was very little grain-filling in the panicles at the time of our visit and that he will get only 60 quintals in his 4 acres of land. His lease price was 20 quintals per acre, irrespective of the yield that he might actually obtain. He appeared to be a devastated farmer at the time of our visit and surprisingly enough, stated that he does not know what he might sow next season however!

In Tentulipada village, a completely organic village and in Kalam village (both in Bhawanipatna block), two other villages that the team visited, no hybrid paddy farmer was present.

SOME OBSERVATIONS FROM THE FACT FINDING VISIT

Our fact-finding visit had its limitations, admittedly; the number of hybrid rice growers met during this visit were only seven farmers, from three villages, while the number of villages visited in search of hybrid rice farmers was five. Further, our visit was not after the harvest of the crop but before; some yield figures are therefore, anticipated yields. However, the farmers met were completely randomly picked up, in a manner of speaking. Kalahandi was chosen as a district that represents poor, unirrigated smallholders of Odisha. While two farmers were 'beneficiaries' of the government programme to promote hybrid rice last year, the others were farmers who opted for private hybrid rice seeds themselves. From the cases of those two farmers, the team was able to get a glimpse or *prima facie* assessment of whether the projected outcomes of the Government of Odisha hold true.

1. It is apparent that the claims made about increased yields with hybrid rice have not turned out to be true. It is only in the case of big farmers with adequate/timely resources including irrigation and farm inputs that yields are higher than in the case of popular HYVs of the area like Swarna, 1010, 1001 etc. Further, as an annexure note to this fact finding visit report shows, several local landraces including from Odisha have higher yields, as tested out in Basudha Farm in West Bengal. However, there has been no systematic effort at acknowledging this, validating and popularizing the same amongst farmers.
2. What is interesting however is the firmness by which the "belief" around higher yields, that too of yields that are higher by at least ten quintals per acre with hybrid rice, is held. In the case of government-distributed seed last year, one farmer got 6 quintals from one acre while the other got 30 quintals. The yields of hybrid rice growers this season are projected by the farmers themselves at an estimated 15 quintals to 30 quintals per acre. It is interesting to note that the farmer most enthusiastic about hybrid rice (from Medinipur), reports a difference of just around 5 quintals between a popular HYV and hybrid rice. The claim of an RKVY project of an additional financial return of Rs. 25000/hectare is certainly not borne out on the ground with farmers we met.
3. None of the farmers consume hybrid rice that they are growing; it is meant only for the market. Higher breakage and lower recovery of rice is reported from the local mills. Farmers say that they do not like the taste or cooking quality of hybrid rice and also feel that it is not nutritious enough.
4. Marketing of hybrid rice is not a problem if it is pushed into the civil supplies establishment when paddy is procured by the government; however, milling and other quality problems remain and for those farmers who cannot get into the regular procurement system, marketing is an issue.
5. We could not come across any smallholder opting for hybrid rice other than one farmer in Manoharpur. But this farmer is devastated now and does not know how to recover his losses from this experiment he undertook. The fact that it is big farmers

(including in the government's promotion schemes) and farmers with assured irrigation who have opted for hybrid rice is a statement in itself.

6. Seed prices are higher by at least four times when it comes to hybrid rice; other popular varieties like Swarna are replaced once in 3-4 years. Costs in terms of chemical fertilizers are also higher in the case of hybrid rice cultivation. Both of these do not augur well for the future.
7. The sensitivity of hybrid rice to climate variability was pointed out; farmers also report that this requires more careful and intense management. Given the current era of climate change and given the disaster-proneness of Odisha state with its vast majority of rainfed, smallholders, promotion of technologies like hybrid rice requires a new risk and vulnerability framework of assessment. They all unanimously stated that desi varieties stood well against the vagaries of weather.
8. However, labour requirement being lower in hybrid rice is being reported by the farmers, during transplantation time; this however is higher during harvest.
9. Increasing the dependency of farmers on external seed sources, that too private sources, does not augur well for the farmers of the state, who have bred thousands of varieties suitable to their needs, situation and preferences over the years. Farmers point out to the inability and inefficiency of the government administration to provide high quality seed on a timely basis. On the other hand, we got to see first-hand the severe setback received by resource-poor farmers (a tenant farmer also in this case), when hybrid rice failed. Exorbitant seed prices which are bound to increase in future, coupled with control over seed supply (what, when, where, at what price, and when if at all being determined by the private external seed sources) in the hands of others will certainly be a burden that farmers here cannot bear. It is apparent that while the dependency of farmers on external seed sources is being consciously pushed and promoted by the state, there are no mechanisms in place to ensure that price regulation takes place, or liability regimes are in place, or diversity is not wiped out, or seed sovereignty issues are squarely addressed. This shows a tremendous short-sightedness from the side of the government.

Two views from official sources (extracted from official documents) are worth placing here. One: Odisha government's presentation on BGREI strategies in the BGREI-RKVY website lists: 'poor adoption of modern technology due to technology inappropriateness', 'salinization and degradation of irrigation system due to poor drainage and declining quality of irrigated land' (under Technological), 'frequent occurrence of natural calamities almost every year', 'absentee landlordism, tenancy and sharecropping impeding risk-free investment' (under BioPhysical) under Critical Issues in its analysis on the way forward. Further, 'increased use of high yielding, hybrid and GM varieties of seeds replacing the traditional varieties (leading to) extinction of certain important characters as well as genetic erosion' is stated as a Threat. We concur.

Two, the discussion that happened in the 8th SLSC (State Level Sanctioning Committee) meeting of Odisha for RKVY projects, dated 3/6/2011 in Bhubaneswar (www.agriorissa.org/pdf/Minutes%2520of%25208th%2520State%2520Level%2520Sanc

[tioning%2520Committee%2520for%2520Odisha.pdf](#)), chaired by the Chief Secretary, Government of Odisha. On the hybrid varieties included in projects under PPP mode, when there was a question on whether these were certified varieties, it was clarified that these are notified hybrids, not certified; the Chair of SLSC suggested that *preference be given to the public hybrid varieties*. He also suggested that the *projects where hybrid varieties are to be used, seed cost should be borne by the farmers....and that farmers may exercise their own choice to select the hybrid varieties suitable for them*. The Government of India representative in the meeting suggested that *impact assessment should be done taking into account the adoption of hybrid varieties by the farmers at their own cost in the area where the demonstrations were conducted earlier and subsequently discontinued*.

The rapid appraisal in the field, a perusal of the official documents and secondary literature available on hybrid rice throw up the following issues to be taken note of, by the Government of Odisha, and more importantly, the Government of India:

- It is not clear by what processes the broad strategies for the Green Revolution in Odisha were drawn up (as in the “Strategic Plan for Green Revolution in context of Odisha”, available on www.agriorissa.org). No participatory processes with key stakeholders are apparent.
- It is not clear how the basic premises and value statements laid down in the Strategic Plan like ‘Sustainable use of natural and biological resources’, for instance, are to be ensured in planning and implementation. For several RKVY projects, it is seen that no impact evaluations are being undertaken. This is quite unscientific.
- It is obvious that no ex-ante impact assessment has been taken up. No learnings from elsewhere like Punjab appear to have been incorporated. “One-size-does-not-fit-all” principle is not governing the plans being made and implemented.
- It is apparent that the Government of India in particular with its centralized planning and guidelines, is not taking into account local situations and vulnerabilities when it prescribes a particular approach to Green Revolution in Eastern India; it is also apparent that no lessons have been drawn from the failures of, and crises created by, the earlier Green Revolution.
- It is clear that hybrid rice holds no solutions for a vast majority of Odisha’s farmers – not in terms of farm economics, not in terms of environmental sustainability and not in terms of productivity improvements either.
- It is also not clear how loss-incurring farmers like Jagbandhu Podh would be compensated; in his case, he would get less than the lease quantity he will have to pledge.
- It is also clear that hybrid rice throws up serious questions about seed sovereignty and erosion of invaluable diversity in the smallholdings of Odisha. It is this diversity that will ensure that entire communities are not devastated in the case of disasters of different kinds and in the face of increased climate variations.

It is time that scant resources are spent on tried and tested sustainable solutions. Odisha government's SRI (System of Rice Intensification) projects are reporting yield increases of 43% to 47%, apart from sustainable resource use and low incidence of pests/diseases. A report by Sahabhagi Vikas Abhiyan ("Innovative Upscaling for Equitable Promotion of SRI in Western Orissa During 2009 Kharif", May 2010) from Western Odisha, showcasing results from the fields of 1774 farmers (more than 80% were smallholders and more than 60% rainfed), reported a productivity increase of 72.5% against the conventional method and the yield was 4.48 tonnes/hectare. In fact, better performance was recorded in rainfed areas!

ASHA urges the Government of India to stop wasting precious resources on tried-and-failed models of Green Revolution (on worse terms now with proprietary hybrid rice) and focus support on climate-resilient, resource-conserving, farmer-controlled, economically-viable farming.

Annexure 1:

Did You Say 'High Yield'?

Folk Rice Varieties versus Modern HYVs and Hybrids

Dr. Debal Deb

In spite of all the hype and false promises, the yield of hybrid rice in India has seldom exceeded 6.5t/ha under irrigated condition on farmers' fields.* On marginal farms (e.g. rain fed dry lands, submerged lowlands, and coastal saline farms), the yield of hybrid as well as any modern rice varieties remains abysmally poor. The reason is simple: none of the hybrids can withstand adverse environmental conditions, especially drought and salinity, on marginal farms. In contrast; there is a plethora of folk varieties (also called 'landraces') that are perfectly adapted to marginal farm conditions and local environmental vagaries. Many of these folk varieties evince amazing yield performance on farm fields. The table on the next page describes some yield characteristics of a few selected indigenous rice varieties grown every year on Basudha farm in West Bengal and Odisha. The data presented here are based on the current year's (2011-12 Kharif) plot wise harvest from Basudha farm. As the data indicates, the performances of these rain fed folk varieties are yet unachieved by any modern varieties (including hybrids) on two counts: (a) zero inputs of agrochemicals and (b) long term yield stability. Even on coastal saline soil of the Sunderban islands in eastern India, the grain yield of a few salt-tolerant landraces is 12.6 t/ha – considerably higher than some of the best lowland high yielding varieties (e.g. Sabita, Lalat) introduced into the coastal districts. Conversely, no modern variety can practically survive on coastal saline farms receiving tidal waters.

The mean yield of numerous lowland landraces often exceeds the mean yield of the best modern HYVs. A good example is Bahurupi, whose average yield generally exceeds 15 t/ha in southern West Bengal.

With adequate rainfall (but no irrigation), its yield can exceed the Chinese average of 6.3 t/ha – after subtracting the loss due to sterile (unfilled) grains. While Bahurupi marks the crown of yield among the high-yield land races, there exist several lowland folk varieties (Table in next page) that outperform modern high input-responsive varieties in similar environmental conditions. One among this select group of high-yield land races is that of Baigana Manjia of Odisha – over 10 t/ha, which is substantially greater than the so-called HYVs tested in Odisha under identical edapho-climatic conditions. In the table in the following page we have compared the yield of two modern varieties released by CRRI, Cuttack.** All these landraces also prove to be resistant to different insect pests and pathogens.

High grain yields are generally more common among lowland folk varieties; owing to obviously greater water availability to the former than to upland varieties. However, farmers' selection of yield-related traits, bred over generations, has produced a considerable number of upland varieties that yield reasonably high – despite zero chemical inputs. Dhankadi Deepa, an upland-adapted landrace from Tamil Nadu, is a

case in point. If the rain is not too late or too scanty, this variety does not require irrigation for a moderate grain output.

If the rain is timely and generous – as was the 2011 monsoon – its yield can reach up to 12 t/ha. The examples given here are only illustrative. Basudha farm conserves a large number of similar high-yield landraces, which subverts the myth that modern HYVs are ‘high yielding’ whereas folk rice varieties are low yielding, by definition. The new frenzy with hybrid rice varieties seeks to reiterate the myth by obliterating all local landraces from the country’s farm fields. A huge number of incredibly high yielding landraces have already been lost from farmers’ fields under the impact of agricultural modernization. In it conservation of the remaining landraces is the need of the day to ensure the food security of the country’s poor. Furthermore, an intensive search for locally-adapted landraces is more urgent than introducing new hybrids with uncertain outputs on marginal farms.

Yield Characteristics of Selected Rice Landraces.

Landrace	Origin	Panicle Density	1000 Grain Weight (g)	%Sterile Grains	Yield(t /ha)
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Upland

Basumati	Odisha	313.00	15.95	6.00	9.91
Dhankadi deepa	Tamil nadu	304.33	24.30	8.80	12.52
Jhanjhi aush	West Bengal	215.00	21.25	6.10	9.06
Lal boro	West Bengal	227.33	22.05	5.00	7.47
Pitti Hidsk	Chhattisgarh	172.33	15.20	4.80	7.02

Lowland

Bahurupi	West Bengal	573.20	20.90	4.30	16.43
Baigana manjia	Odisha	493.08	16.05	4.67	10.70
Bishmoni	West Bengal	341.67	24.60	6.47	14.31
Bourani	West Bengal	412.70	24.20	3.30	13.21
Ghora-sal	West Bengal	312.67	27.75	5.10	14.82

Saline land

Lal Getu	West Bengal	230.80	24.25	11.20	7.95
Nona Khirish	West Bengal	206.33	33.20	5.60	8.69
Talmugur	West Bengal	200.00	31.25	5.40	12.68

Modern HYV (Lowland)

Lalat	Central Rice Research Institute	172.20	28.30	10.50	4.80
Sabita	CRRI	139.53	30.20	7.90	5.60

[Source: Data from Basudha Farm (2011)]

Footnotes

* B.C. Viraktamath, B.C. 2011. *Hybrid Rice in India -Current Status and Future Prospects*, Directorate of Rice Research, DRR, Hyderabad, See page 10, Available at <http://14.139.94.99/sites/default/files/ris/research-themes/Hybrid%20rice%20in%20India.pdf>

** CRRI 2005, *Miracle Rice Varieties of India*, Central Rice Research Institute, Cuttack