

HYBRID MAIZE PROMOTION IN RAJASTHAN: WHO BENEFITS?

- REPORT FROM A FACT FINDING VISIT BY ASHA¹

Why this Fact Finding on Project Golden Rays?

Rajasthan government, like a few other state governments has been utilizing funds available in the National Agriculture Development Programme/Rashtriya Krishi Vikas Yojana (RKVY) to promote proprietary hybrid maize seeds, particularly of Monsanto, on a large scale with tribal farmers in the state, in the name of increasing productivity and incomes of farmers. The project, named as 'Project Golden Rays', sought to emulate the Gujarat project by the name of 'Project Sunshine'. Monitoring and evaluation reports of the Gujarat project have shown that yield increases on the ground are not as claimed or promised, that indebtedness for investment in agriculture has gone up after the project intervention, that yield variability has been high, that water issues are cropping up and that chemical fertilizer use has been unscientific, amongst other issues. Kharif 2011 had been the third year of this hybrid maize promotion spree by the government in Rajasthan, using Public Private Partnership as the main tool. PPPs have become convenient vehicles by which several scientific and institutional norms that exist in the Indian Research and Extension systems are being side-stepped easily, opportunistically and in an unaccountable fashion. RKVY funds, given that they come with a great deal of flexibility from the Government of India, are also easy money as far as state government plans and spending are concerned.

After looking at how these projects are being run in states like Gujarat and Orissa and after flagging off major concerns with regard to such large scale promotion of maize, that too of hybrid maize and within that proprietary hybrids², ASHA (Alliance for Sustainable & Holistic Agriculture) took up a fact finding visit to Dungarpur and Udaipur districts of Rajasthan, on December 24th and 25th 2011 to capture farmers' experiences of this project and the future implications. This report is based on this fact-finding visit. As part of the effort, a team consisting of Kavitha Kuruganti (Convenor, ASHA), Nilesh Desai (Beej Swaraj Abhiyan, Madhya Pradesh), Ananthoo (Safe Food Alliance, Tamil Nadu) and Bharat Shrimali (Asha Sansthan, Rajasthan) interacted with farmers from Sagwada, Bichhiwada and Aspur tehsil of Dungarpur district, Kushalgarh tehsil of Banswara district and Girwa block of Udaipur district, in addition to interacting with a senior (retd) public sector maize breeder, a very senior extension official and main functionaries of NGOs³.

1 ASHA, or Alliance for Sustainable & Holistic Agriculture is a national, informal network of more than 400 organisations of India which had come together to organize the Kisan Swaraj Yatra in 2010, concerned about the continuing agrarian distress in the country and working to save our Food, Farmers & Freedom. Please visit www.kisanswaraj.in for more information.

2 Earlier reports available on www.kisanswaraj.in

3 On the 24th of December, the team members interacted with around 15 farmers from different tehsils of Dungarpur and Banswara districts, outside the Vagad Kisan Mazdoor Maha Panchayat in Dungarpur, in addition to visiting Samithed village of Mada Panchayat in Dungarpur block; on the 25th, they met with farmers of Pi village in Girwa block of Udaipur district, in addition to meeting a very senior retired extension official and a very senior retired breeder. In Dungarpur, we interacted with farmers like Mohanlal Dodia, Kokapur village; Hakraji Parmar, Basor village, Gomtiprasad Paharia, Limbod Badigaon; Sankarlal Dayama, Sagwada, Devlal Kanaji Manath, Tundawada; Dhoolchand Bhooria, Kushalgarh; Maganlal Kheria, Sagwada; Laxmanlal Dindor, Chatrapura, Amarsingh, Bansadi; Narayanlal Dindor, Bankoda; Ramchandra Baria, Ramgarh; Nathmal Bhooria, Darthara; Kaluram Damor, Kukapur; Devji Roopa, Charwada; In Mada, we met with Ramdas Vaishno, Shankar Nathuji, Jeeva Nathuji and Ramji Soma. In Pi village, we interact with men and women farmers from different villages of Jhadol block, like Meera bai, Homi bai, Champa bai, Thavri bai, Devlibai, Mangilal, Thakurchand Damor etc. We interacted with top functionaries of PEDO, Dungarpur.

This report captures the main issues that emerged during our interactions, and the reporting/observations of farmers on the same. All the farmers that we interacted with (around 30 in all), except one (who had migrated from the village for a brief period), have been "beneficiaries" of the government's hybrid maize promotion projects. While ASHA does not claim this to be a "study", the interactions certainly had a randomness to them in terms of farmers met.

'PROJECT GOLDEN RAYS'

This project was launched in Rajasthan (apparently influenced by 'Project Sunshine' in neighboring Gujarat and possibly effected by high-level lobbying by Monsanto with Rajasthan Government) in Kharif 2009. The stated reasons were: popularizing hybrid seed and increasing productivity/income per unit land in maize crop.

The maize area in Rajasthan is around 1.10 million hectares, with the productivity being around 18.60 quintals per hectare, as against an all-India maize area of around 8.3 million hectares and yield of 24.35 quintals per hectare. Rajasthan has the largest maize cultivation area in the country (about 16%), followed by states like Uttar Pradesh, Madhya Pradesh, Bihar etc. Within Rajasthan, Udaipur, Bhilwara, Chittorgarh, Banswara, Dungarpur and Rajasmand districts have large areas of maize cultivation. Yields-wise, Chittorgarh, Jhalawar, Bundi and Banswara have higher yields (2007 and 2008 data).

2009: In Kharif, through PPP mode, the Directorate of Agriculture tied up with Monsanto to supply 90 MTs of Monsanto's propriety brand seed (Prabal and Hi-Shell) to 18872 farmers in Udaipur and Banswara. It is unclear how the company was chosen, how the specific brands were chosen and how beneficiaries were chosen. Rajasthan government's Planning Department reports yields of 32-35 quintals per hectare, in the crop-cutting undertaken by Collector, Banswara (as compared to average yield of 17-18 quintals per hectare in the district); Udaipur also reportedly reported 50-100% higher yields⁴. The project was extended to Banswara in Rabi, through supply of 56 MT of 'Supreme' hybrid seed. Elsewhere, in another Planning Department's document, it is reported that 165 MT of seed was distributed in both seasons to 30,449 tribal farmers in all with an expenditure of 1.57 crores. It was claimed that the project improved the socio-economic conditions of farmers despite adverse weather conditions in 2009.

2010: In Kharif 2010, the plan was expanded to cover around 35% of the corn-growing areas in the tribal districts (entire Tribal Sub Plan Area) of Banswara, Dungarpur, Pratapgarh, Sirohi and Udaipur. Accordingly, funds in ISOPOM and RKVY were tapped into, and all tribal and non-tribal BPL farmers (7.83 lakh farmers) were covered, with each farmer being given 5 kilos of Monsanto's proprietary hybrid maize seed, with the tribal development department additionally giving fertilizer free of cost to farmers⁵. It is claimed that adequate technical staff has been deployed for guidance to the farmers. A total of 39130.60 quintals of seed has been distributed, it is reported.

2011: The RKVY website (<http://rkvy.nic.in>), under Project ID RA/RKVY-SEED/2011/354 lists Project Golden Rays as an Innovative Scheme under the Seed Sector as a Proposed Project for 3 years with an outlay of 73.93 crores, for distributing 39000 quintals of hybrid maize seed (at 5 kgs of seed rate per acre, this should cover 7.8 lakh acres). Seven lakh farmers are listed as expected beneficiaries.

⁴ www.planning.rajasthan.gov.in/Annual%20plan_1011/chapters/pdf/chap_7.pdf

⁵ http://www.planning.rajasthan.gov.in/Annual%20plan_1112/chapters/pdf/chap_7.pdf

It appears that Monsanto's Dekalb hybrid maize (DKC7074), Prabal and JK Seeds' proprietary hybrid maize (JKMH 175) seeds were distributed in the Kharif of 2011, amongst other brands (Bisco SeedTec's Bisco Bheem/8555, Shriram Bioseeds' BioSeed 9637, NSC's Pusa2). It appears that an open bidding process through tenders was taken up in 2011, after criticism of the projects in the earlier years by civil society groups and media. Further, it is reported that the cultivars distributed in 2011 are notified.

Project ID RA/RKVY-CROP/2010/305 lists Project Golden Rays as a project under Crop Development Sector, with an outlay of 80.390 crores (1.62 crores in 2009-10, 38.93 crores in 2010-11 and 35 crores in 2011-12 as financial outlay).

Rajasthan government has also accessed RKVY funds of upto 12 crores under ISOPOM, under Support for Seed Component (RA/RKVY-SEED/2011/361), in addition to another project for "Increasing SRR (Seed Replacement Rate) for BPL and Tribal Cultivators in six districts" (2009-2010) (RA/RKVY-SEED/2010/299) in addition to "Special Projects for enhancement of productivity of crops, increasing SRR (Kharif & Rabi)" (2009-2010) (RA/RKVY-CROP/2010/302). Another project called "Enhancing Seed Replacement Rate (SRR) of Oilseed, Pulses and Maize in Rajasthan under Stream-II" seems to have similar objectives (RA/RKVY-SEED/2010/028) which claims that productivity has been increased!

Meanwhile, the SCA (Special Central Assistance to Tribal Sub Plan) in 2009-10 had 4.8 lakhs allotted for Maize Crop demonstration in five tribal districts for 800 demonstration plots; in 2010-11, a Hybrid Maize Minikit Demonstration Programme under SCA had 3.8 lakh units as the target, with an outlay of 11.40 crore rupees. This was further enhanced to 12.54 crores for the same target of 3.8 lakh units in 2011-12.

**District-wise, year-wise spending on Project Golden Rays
(in lakhs of rupees, based on seed supplied):**

District	2010-11	2011-12 (upto Dec. 2011)
Banswara	1140.38	635.76
Dungarpur	0958.70	375.25
Udaipur	1070.01	619.56
Pratapgarh	0505.20	253.87
Sirohi	0050.34	048.47
TOTAL	3724.63	1932.91

Source: Data obtained from Directorate of Agriculture, Rajasthan dated 23/1/2012

District-wise details of seed quantities distributed (in quintals):

District	2010-11	2011-12
Banswara	11980.70	14787.05
Dungarpur	10072.05	10406.05
Udaipur	11241.45	11656.20
Pratapgarh	05307.60	04368.50
Sirohi	00528.90	00841.50
TOTAL	39130.70	42059.30

Source: Data obtained from Directorate of Agriculture, Rajasthan dated 23/1/2012

It is reported that in 2011, all tribal and non-tribal BPL farmers of the TSP areas (districts) and Saheria tribal farmers in Kishanganj and Shahabad tehsils of Baran district.

The price details at which seed was procured is given below:

Hybrid Maize variety	Price in 2010-11 (Rs/Kg)	Price in 2011-12 (Rs/Kg)
Prabal	99.937	Not supplied
DKC-7074	99.937	72.00
Bisco-8555	Not supplied	78.00
PEHM-2	Not supplied	47.50
BIO-9637	Not supplied	72.00
JKMH-175	Not supplied	68.00

Source: Data obtained from the Directorate of Agriculture under RTI Act

In Kharif 2010, the project was implemented on PPP basis and there are no apparent grounds why Monsanto was selected or particular brands of its seed were selected nor on what basis the seed price was determined. It is claimed that the implementation of such a project was discussed in a meeting with various companies but offer for implementation of the project on PPP mode was made by M/s Monsanto India Ltd. The MoU between the state government and the company claims that the seed price of Rs. 99.375/kilo, in packets of five kilos each is the price at which MIL has supplied these specific hybrids to the Gujarat state government towards a project of a similar nature!

Ironically, an RTI application which asked for full details of liability mechanisms in place for the project in case of failure, received a response that said "NIL" against this request. The MoU with MIL in 2010-11 at (6) states that MIL's liability with respect to quality of seeds supplied will be limited to germination and physical & genetic purity standards as outlined (Minimum 90% of germination and Minimum of 98% and 95% for physical and genetic purity). Disputes arising during the course of execution will be referred to arbitration under the provisions of Arbitration and Conciliation Act, 1996, the MoU specifies.

While there are no monitoring and evaluation reports with regard to this project that were provided by the Government of Rajasthan when asked under RTI Act, the following yield data was provided, as obtained under crop cutting experiment during Kharif 2010.

District	Maize hybrid	Yield (Kg/Ha)	District Avg Yield (Kg/Ha)
Udaipur	Prabal	2523	1368
	DKC-7074	2188	
Banswara	Prabal & DKC-7074	2059	2066
Dungarpur	Prabal	2208	1465
	DKC-7074	2440	
Pratapgarh	Prabal & DKC-7074	3141	1414
Sirohi	Prabal & DKC-7074	2405	1786

Source: Data obtained through RTI application

No details of the crop-cutting experiments are available with ASHA to find out if they are representative of most of the growing situations in these districts.

As per the above table, while the average yield from the project hybrids, as obtained in crop-cutting experiments is 2423.4 kilos per hectare, the average yield in the project districts is 1619.8 kilos per hectare, which is a 49.6% yield increase (3.2 quintals' yield increase per acre, on an average).

FINDINGS OF THE FACT FINDING VISIT BY ASHA

1. **Yields of Hybrid Maize:** While this year, the crop has been badly affected – there have been many cases of no germination at all at the beginning of the season and excessive rain affecting performance later on – amongst all the farmers that we interacted with, the highest yield with hybrid maize seed (last season) was 8 quintals per acre (one farmer). With the others, it usually is around 5 quintals per acre; interestingly, in desi maize, the yield was reported to be around 4-6 quintals, with the highest reported at 8 quintals too. Overall, the reporting of farmers in these interactions indicates that yields are the same with hybrids and desi seed, in farmers' real growing conditions (this might be different from what the project officials are reporting from 'crop cutting experiments' – the methodology for the crop cutting experiments and its implementation has not been looked into by ASHA).

This year, the crops – both hybrid and desi – have been affected by pest infestation too. One farmer reported that while the desi seed yielded 4 quintals this year, there was no produce at all from hybrid seed. There is also an observation that the 'doonda' (cob centre or pole) of hybrid maize is larger giving an appearance of greater produce while the rows and grains are the same as in desi.

It is worth noting that there has not been a single case of problems with germination with desi maize seed, while the same was reported with hybrid maize seed. This might have something to do with the water requirement for hybrid maize during germination phase. While technical explanations may be provided for why the germination problem has occurred, as far as the farmers are concerned, a precious season has gone by with their livelihood affected.

2. **Consumption of hybrid maize as food:** The farmers don't prefer eating hybrid maize – they grow hybrid maize only to sell it off, given that the seed is being given free of cost and triggered by the yield promises. The ones who tried eating this complain that while it is ok to eat rotis made of hybrid maize when they are hot, they become very hard and crisp (*kadak*) when cold and are not preferred (*"bhoonsa jaisa ban jaata hai"*). The farmers also prefer yellow colored grain in some locations and white colored grain in some others, which is not always the case with hybrid maize brands being promoted.

It was a uniform situation across different locations that farmers grew their own desi maize for household consumption, while hybrid maize is meant for the market.

When asked whether they knew the hybrid maize in markets goes to, they didn't have a clue and they were bemused to know that most of it goes into poultry/livestock feed.

Farmers also reported that hybrid maize is difficult to work with in the fields ("rough leaves", for the hybrid lines they tried out), leading to skin problems for workers.

3. **Observations on livestock preference:** The current hybrid maize brands are reported to be wide-leafed, with the stalk being hard – livestock do not prefer eating this as fodder, as compared to desi maize – this was a unanimous observation.
4. **Pesticides and Fertilisers with hybrid maize:** All the farmers that we interacted with said that pestilence is more on hybrid maize. While farmers in this region are mostly averse to using chemical pesticides to control such pests, their potential use in future

cannot be ruled out. Chemical fertilizers are not preferred by all farmers as they realize that this is not good for their soils – farmers in this scheme of the Government of Rajasthan got one bag of Urea and one bag of DAP free of cost – not all of them used it while some have stocked the fertilizers up for further trading! However, when the question around chemical fertilizers was posed in a different way – “if one plot of desi maize and one plot of hybrid maize are planted and neither is given any fertilizer, which one would perform better” – there was a unanimous response – that while desi maize would yield something even in that condition (“25% of normal yields”), hybrid maize would not. It is obvious that breeding as well as testing is happening in the best-managed conditions while this is not quite the reality with the tribal farmers of the region. While fertilizers are being given free of cost now, affordability and desirability in future are big questions.

5. **Water requirements for hybrid maize:** In years of excessive rain like this season, farmers felt that hybrid maize fares better than desi maize; when asked how many less-rainfall years in 5-year cycles, they however reported that most years are drought years (at least 4 years out of 5 years), when one year could be excessive rains. Given this reality, it is again clear that desi maize is what would lessen the risks for farmers and not hybrid maize. The criticality of adequate water in the germination phase was also emphasized.
6. **Seed saving & re-sowing/Seed Sovereignty issues:** The team found that while many male farmers knew that they cannot save seed from their hybrid-seed-based crop to be re-sown the next season, the women farmers were unaware of this and were blissfully planning to do so! We also came across one farmer who narrated that he has indeed done this and incurred losses. There is the obvious matter of seed prices being unaffordable for farmers; once the government’s doling-out stops, many farmers would find themselves in a situation where they would neither have their own seed nor be able to afford to purchase seed from these corporations. Records from elsewhere do show that corporations increase prices of seed quite exponentially year by year, apart from the fact that control over the most critical input in agriculture will go away from the hands of our farmers.
7. **Mono-cropping:** Most farmers that we met in the region do grow maize, even their desi maize, in a mono-cropped condition. However, we also came across farmers who go in for blackgram (urad) and pigeonpea (toor) with maize. We found that the advent of hybrid maize inevitably converts a mixed cropping field into a monocropped one (*'kachda nahin daalna'* as one farmer put it, about the requirement of a hybrid maize field!), bringing with it many concomitant shortcomings, especially in rainfed growing conditions. This has implications on the risk-bearing capabilities, soil and pest ecology as well as the food/nutrition security of the farming family.
8. **Grain storage issues:** We found that farmers in the Dungarpur group discussion reported that hybrid maize grain can be stored for only 2 months at the most – storage pests are higher and all the grain becomes into a powder beyond this period; however, desi maize can be stored for at least 12 months, they reported. This low shelf life of hybrid maize grain has implications for food security as well as for the marketing options available to farmers. This was later confirmed by Dr V N Joshi - high starch and loosely packed grains are the reason for pests and lower shelf life.
9. **Cost of cultivation higher with hybrid maize:** A calculation with farmers showed that the cost of cultivation with hybrid maize is higher by at least two thousand rupees,

if not more. This includes seed cost, chemical fertilizers and chemical pesticides. This means that hybrid maize has to yield at least two quintals more than desi maize, just to cover this increased cost of cultivation. This also means that farmers have to have an additional cash flow of two thousand rupees without which they will have to borrow from external sources (exploitative or otherwise). The difference in performance on the ground however is not reflecting this minimum requirement.

In fact, **higher risks** with hybrid maize for a marginalized community is what is apparent from the interactions with farmers. Risks with desi maize are lower not just in terms of stress tolerance and lesser external inputs to be given, but because of shorter-duration varieties like *Saathi*. Hybrid maize also requires greater attention and timely management according to some of the farmers.

10. Current adoption rate of Hybrid maize: It was reported by farmers that we interacted with that just in the past 3 years or so, the proportion of hybrid maize within total maize sown in the area has become 50%. This is a massive change being brought about by the government rapidly, on a large scale. Given much academic work coming out in recent times about the "de-skilling of farmers" with rapid technological change that does not allow them to take rational decisions based on 'environmental learning', there is a need to re-think such large scale programmes. While farmers seem to innocently believe that somebody or the other will have desi seed for them once the programme ends (very few farmers reported that they will continue with the hybrid maize seed once the project ends – they were all averse to purchasing the seed from outside and reported that the current acceptance is only because something is being given to them free of cost by the Gram Sewak!), it is apparent that this would not be the reality.

11. Observation on Soil Fertility: All farmers we met reported that soil productivity gets impacted by cultivation of hybrid maize. They say that the lands are becoming bad with rapid extraction of nutrients by hybrid maize plants.

A senior (retired) maize breeder that we met also confirmed that while short duration lines (80-90 days) are available and are more suitable for the rainfed conditions of the farmers in the region, late season or full season hybrids (100-110 days) are being promoted. These are unsuitable. He also opined that composite lines are more suitable.

While flint to semi-flint type seed with higher oil content and appropriate starch is good for rotis, private hybrids with greater starch content, softer grain and loosely packed grain on the cob are being promoted – while this is good for the starch industry, it is not good for consumption or storage, he pointed out.

While maize is preferred by the local communities as a staple food, given that it releases energy over a longer period of time, starchy (hybrid) maize does not have this quality.

This breeder expressed his concern over the public sector research and extension systems virtually collapsing; he pointed out that while public sector scientists work for many years in a rigorous, scientific fashion to bring out cultivars that suit local growing conditions, the current trend of PPPs are paving an easy way for large corporations to expand their markets at the expense of farmers and public sector institutions. Thus there was no level playing field, he observed and stated the state corporations were handicapped with the system requiring (quite appropriately) proper testing, localization, growing condition, going through release committees etc. He questioned the wisdom in moving away from composite lines in

this area, and wondered how appropriate it is for us to compare ourselves (India's yields) with China and USA when the situations are vastly different. Who is deciding, on what basis, he questioned.

RAJASTHAN GOVERNMENT'S PROJECT GOLDEN RAYS & PERTINENT QUESTIONS

Based on information gathered about the current projects being implemented by Rajasthan government using taxpayers' funds, on findings from the interactions with farmers and experts, the following pertinent questions arise about the large-scale programme of proprietary hybrid maize promotion by the Government of Rajasthan:

- * Is this promotion of maize really supposed to cater to increasing needs of Food for the poor in the country and for the growing population in India? If that is the case, why is the larger picture showing that 51% of maize is being utilized for Poultry Feed, 11% for Animal Feed (62% in all for Feed!), 11% for Starch, 1% for Seed, 1% for Breweries and only 25% as Food⁶? If that is the case, why are cultivars which are not suitable for local consumption, but for other purposes being promoted? Why are cultivars that cannot be stored by the farmer's family for more than 2-3 months being promoted? Why are agronomic practices that increase mono-cropping being promoted? Will this benefit industry or poor tribal farmers, in the name of Food Security?
- * How are brands and companies being selected in these projects and on what scientific basis? Testing of some of these seeds is being taken up only now, parallel to the implementation of the large scale project. While questions about the rigour of the testing in the Agri-Universities are being asked, it is also apparent that experimentation is actually happening at the expense of hapless farmers! Why are brands in the project being changed every season and on what basis?
- * Even in the case of testing and assessment of some sort, is Sustainability a parameter? Is economic viability with proprietary hybrids a parameter, given that seed prices are constantly being increased in an exorbitant fashion by these private corporations? Is the testing done in the real-life growing conditions of resource-poor farmers? Is testing done to take into account adverse seasons, stress tolerance and climate change? Do yields get measured as grain yields specifically, given that the cob poles are bred to be larger in the private hybrids?
- * How did the company in question have such huge seed stock ready for projects in Kharif and Rabi? What explains their readiness? When were the deals finalized, with what terms and conditions, especially in terms of accountability?
- * In the current testing underway, which brands are being tested for, given that brands are changing each season? Is it scientific enough, given the fact that inside, reliable sources told the fact finding team that it is actually unscientific.
- * Where is an ex-ante impact assessment for this project, given that the number of people, extent of land and financial outlays to be affected in this project are huge?
- * What are the accountability mechanisms present in this project, on the seeds corporations and the public sector institutions and departments? Who is responsible for the germination

⁶ Slide 3 of a presentation by Dr Mukesh Vyas of Rajasthan College of Agriculture, MPUAT-Udaipur, called "All India Coordinated Research Project on Maize – Maize Status in Rajasthan", available on the website of the Directorate of Agriculture, Government of Rajasthan, accessed on 30/12/2011

and performance problems of hybrid maize witnessed this season? Why should poor tribal farmers have to take out protest rallies, take up media advocacy, appeal to SDMs etc., in a project that lured them into hybrid maize cultivation and was not initiated by them voluntarily? No support has been extended to the farmers even now – who is responsible for a precious season being lost to farmers?

* Has capacity building of farmers been taken up as claimed since the Fact Finding Team came across only one farmer amongst all the farmers that we interacted with, who has attended a training programme.

* Who is to be held accountable for the spurious fertilizers supplied and for the fact that fertilizers are being diverted from this project to black market sales? Farmers reported that the chemical fertiliser given to them was not soluble till the end of the season whereas in normal use, it does within 2 days.

* On what basis is the expansion happening? Have there been concurrent reviews and evaluations in a holistic manner, apart from crop-cutting experiments? How rigorous are these crop-cutting experiments, given that our interactions clearly showed that a rare, maximum yield of 8 quintals/acre was what one farmer from a random group of farmers reported (average only around 5 quintals), while yields of upto 14 quintals have been reported from the crop-cutting experiments!

* Why are public sector hybrids or composite lines not being promoted? What is the point in investing taxpayers' funds in public sector research if the outputs cannot be taken to the farmers and if the government itself actively displaces such public sector products through the expansion of private markets with taxpayers' funds? While a lot of scientific rigour is expected in the case of public sector breeding efforts, why isn't the same standard applied for private sector brands – is the public sector being penalized for adopting a scientific approach?

* Why could not the same fund be utilized to strengthen the hands of the State Seeds Corporation in producing high quality maize seed of suitable composite lines or traditional varieties and distributed to farmers? Similarly, one of the NGOs met during the fact-finding called PEDO is taking up a seed multiplication and distribution project of composite lines (which they had to obtain from Gujarat, since the local research institutions said that they don't have breeder seed available!) with farmers in eleven villages using NAIP funds. While such decentralized seed systems can be promoted, including the Seed Village concept of the government, what is the rationale for using public funds for promoting proprietary hybrids (that too of specific private companies alone)?

* While on the one hand, "micro-farming situations" and an appreciation of the diverse growing conditions (including socio-economic, of the farmers) is being emphasized upon, projects like these show a "one-size-fits-all" approach. Isn't there a need to resolve the contradictions here and decide which approach is desirable and truly beneficial to farmers?

* Is there any assessment of cost-effectiveness of projects like this? In the first year, it is reported that Monsanto proprietary seed was procured at around Rs. 110/kilo and this Kharif, through a bidding process, seed price was fixed at Rs. 72/kilo. However, with public sector seed, seed price could have been around Rs. 25/kilo only. Where is the assessment of whether benefits, if at all, have been commensurate with this kind of investment, decidedly away from a less-expensive, farmer-controlled alternative?

* Have there been enough investments in participatory varietal development in the farmers' fields, focusing on improving the breeding skills of local communities, focusing on desi varieties like *Saathi makka* or *maalan makka* (whose yields appear to be equivalent as per our interactions with farmers, in their real life growing conditions and more importantly, suit the farmers' preferences)? Why are no such investments being made?

We conclude by saying that on the ground, Project Golden Rays is not what it claims to be and our visit only reiterates that a variety of questions remain unanswered with projects such as these: questions on the scientific basis, motivation, project design and implementation; questions on procedures and protocols adopted for the project; questions on actual benefits that have accrued to farmers; questions on looming issues of food and nutrition security, sustainability, viability, risks and vulnerabilities; questions on accountability, seed sovereignty and so on.

We ask yet again: Why hybrid maize? Why proprietary hybrids? Why violate certain scientific and administrative norms when deciding on some proprietary hybrids?

We ask, WHO IS DECIDING ON WHAT BASIS? Where are communities involved in all of this? This is a very pertinent question related to Governance and Self-Rule, given that we are talking about Fifth Schedule Areas and tribal development and governance perspectives in the case of Project Golden Rays. Maize is an integral part of the socio-cultural fabric of the communities here and any large scale intervention has to acknowledge that tribal development requires a different dispensation and a business-as-usual approach is unacceptable.

The fact-finding team demands a satisfactory answer to all the above questions before the project can proceed further. We demand an immediate scrapping of the project and alternate investments of finances for securing livelihood improvements without compromising food security and sovereignty.