Commercial agriculture: Maximizing profit or Maximizing Risk?

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Abstract— Unarguably, agriculture is the backbone of our country. The study has tried to find out the dynamics of commercial agriculture and its impact. It shows the promotion of crop diversification and shift from subsistence farming to commercial farming. Commercial farming is market oriented and driven by external agencies. It has made allow the use of hybrid seeds and other chemicals, which has enhanced the profit of the farmers. It has also led to genetic erosion, pest resurgence, excessive use of chemical & water depletion, which as hazardous effect for the biodiversity.

Keywords: Commercial farming, Market oriented, crop diversification, environment

I. Introduction

India is a country of about one billion people. More than 65% percent of India's population lives in rural areas, where the main occupation is agriculture. Indian agriculture is characterized by small farm holdings. The average farm size is only 1.57 hectares. Around 93 percent of farmers have land holdings smaller than 4 ha and they cultivate nearly 55 percent of the arable land. On the other hand, only 1.6 of the farmers have operational land holdings above 10 ha and they utilize 17.4 percent of the total cultivated land (as per census 2011).

The agriculture sector at present employs 60 percent of the country's work force. With the development of alternative sources of employment in the rural areas, viz., agro industries, supportive infrastructure, etc., it is hoped that the share of population dependent on agriculture will come down, though not commensurately, by the year 2020. It is hoped that 45-50 percent of the population will be dependent on agriculture by that time (Singh)

Broadly, these can be classified into two groups – food grains crops and commercial crops. Due to the challenge of feeding our vast population and the experience of food shortages in the pre-independence era, 'self reliance' in food grains has been the cornerstone of our policies in the last 50 years. Around 66 percent of the total cultivated area is under food grain crops (cereals and pulses). Concurrently, commercial agriculture developed for whatever reasons in the pre-independent phase also kept flourishing during the post independent period.

The Jharkhand State has a geographical area of 79.70 lakhs ha. About 23.6 lakh ha. (29.61%) is covered under forest and 38 lakh ha. is the area of cultivable land in the State. The net irrigated area is about 28% of the net sown area. Some of the economic indicators have been shown for the State of Jharkhand as below:

S.no	Indicator	Jharkhand	India
1	GSDP Growth Rate	12.08	8.2
2	Irrigation Coverage	28.00 %	67%
3	Cultivable Area to Total Area	47.67 %	47.67 %
4	Net Sown Area to Total Area	29.63%	46%
5	Per Capita/Day availability of Food Grains	546 gms.	550gms
6	Forest Coverage to Total Area	29.61 %	23.57 %

Source: DES & Economic Survey GoJ, 2011-12

Jharkhand has made significant progress in agriculture production in last two years. Approximately 85% of cultivated area is under different food crops as against 65% area at the National level. Rice is the major foodgrain crop of the State covering approximately 80% of the total cropped area. Agriculture is largely rain fed and assured irrigation is available to approx. 28% of total cultivated area. The agriculture is highly dependent on rains but ground reality is changing fast.

II. Objective of the Study

- To understand the dynamics of commercial agriculture
- To study and analyze the impact of commercial agriculture

III. Methodology for Data Collection:

A. *Primary Data Collection*

- Simple random Sampling
- Interview
- Participant observation
- Focus group discussions
- Triangulation
- Photography

B. *Secondary data Collection*

- Articles
- Journal
- Internet

IV. Area of Study

The study area is Saher panchayat of Nagri Block, which falls under the state capital Ranchi. It is situated 20km away from Ranchi, which is both district & sub-district headquarter of Saher village. As per 2009 stats, Saher village is also a gram panchayat. The total geographical area of village is 546 hectares. Saher has a total population of 3,084 peoples. There are about 587 houses in Saher village. Nagri is nearest town to Saher (Census 2011). Harhi, Khunta, Plandu, Katrpa and Saher are the revenue villages of the panchayat, which tribal dominated population. Munda and Oraon dominate the tribal population, while Koiri Mahto dominates as OBC. Muslim population is also found in the panchayat.

The Panchayat is known for vegetable production in the state. Farmers of the area are commercial growers, who mainly grow vegetables and sugarcane. Early potato, frenchbean, green pea, ginger, cabbage, cauliflower, chilli and sugarcane are the major crops of the area. The vegetables are exported to nearby states like Odhisa, West Bengal and Chhattisgarh. The red sugarcanes are supplied to Bihar during Chathpuja from this area only.

V. REVIEW OF LITERATURE

Human civilizations have benefited greatly from the domestication, conservation and use of plants species used for agriculture and food production. For thousands of years, farmers have used the genetic variation in wild and cultivated plants to develop their crops. Genetic diversity is the basic factor of evolution in species. It is the foundation of sustainability because it provides raw material for adaptation, evolution, and survival of species and individuals, especially under changed environmental, disease and social conditions (Hammer, 2004), and it will allow them to respond to the challenges of the next century (Hammer *et al.*, 1999).

In addition to food safety, other concerns involve ecological risks, such as new or increased resistance to insecticides and weed resistance to herbicides due to hybridization or excessive selection pressure, changes in the ecological competitiveness of crops, and the possible loss of genetic diversity in areas of crop origin (St Amand *et al.*, 2000).

Genetic diversity gives species the ability to adapt to changing environments, including new pests and diseases and new climatic conditions. Over the millennia, traditional farmers have given us an invaluable heritage of thousands of locally adapted genotypes of major and minor crops that have evolved because of natural and artificial selection forces (Myers, 1994). The genetic base of landraces, wild and weedy relatives in which future breeding is based have been threatened by various factors of genetic erosion. Erosion of these genetic resources along with accompanying practices and knowledge that farmers use to develop, utilize and conserve crop genetic resources could pose a severe threat to the world's food security in the long term. Yield (or yield potential), which is the characteristics of most modern varieties, is the most important criterion for the choice of a variety by a farmer (Heisey and Brennan, 1991). The "Green Revolution" contributed and still undoubtedly contributes to the loss of genetic diversity, even if the issue is not as cut and dried asWood and Lenn´e (1997) state it in the equation "Green revolution = Loss of genetic diversity". Population growth, urbanization, developmental pressures on the land resources, deforestation, changes in land use patterns and natural disasters are contributing to abundant habitat fragmentation and destruction of the crops and their wild relatives.

VI. FINDINGS: ANALYSIS AND DISCUSSION

A decade back, mono cropping had been prevalent in this area. Due to lack of perennial stream and check dams, irrigation facilities have always been the challenge for the farmers. Paddy was the main crop grown by the villagers. But, the situation is changing over the period of time due to urbanization and infrastructure development. The impact of green revolution is yet to reach fully in this area. Although, farmers are naturally learning and developing package and practices of crop production by themselves only as the govt. intervention is least.

VII. CROP DIVERSIFICATION: NEED OF THE HOUR

Monsoon has played great role in shifting agriculture in this area. The erratic rainfall from past many years and continuous droughts in the state has changed many things; from farmers psychology to crop cultivation. Paddy was sown in all the lands (low land, medium land and upper land) with different techniques using different suitable varieties. This culture of upland and medium paddy cultivation has fully vanished in this area and the lower-medium land (locally known as chaunra) paddy cultivation has been halved as all the farmers admitted. According to the farmers, they have got huge loss of cultivating paddy in upland and medium land due to less water poor rainfall since last 6-7 years. On uplands, majorly millets like finger millets, etc. were transplanted/broadcasted, but, it has been fully replaced by creeper vegetables or those lands remains fallow as per villagers. On medium land, crops like maize intercropping with cowpea, early crop of ginger or sugarcane is being cultivated in this area. Medium lands and uplands are also being used for cultivation of kharif potato, tomato, brinjal, chilly, maize, cabbage, cauliflowers, French beans and other vegetable crops in kharif season.

If such land remains fallow in kharif season, the same land is used for early green pea, potato, cabbage, cauliflower and French bean in rabi season. You will hardly find fallow land in rabi season in this area, villagers say. Vegetables are the main crop cultivated in rabi season. During summer, medium land and upland remains fallow, whereas lowland is used for vegetable cultivation. Creepers, frenchbean, green pea, tomato, cabbage, brinjal, chilly, maize etc are grown in this land. The cultivation of zaid crop depends on irrigation facilities available to the farmer.

VIII. AGRICULTURE AS BUSINESS

The area of paddy crop cultivation is shrinking and the cultivation of vegetables crop are dominating the same due to profitability as well as erratic monsoon. Indeed, diversification away from rice to high-value crops such as fruits, vegetables and flowers has been successful in many countries of the Region, although quality and timely production are usually crucial to economic success with such high-value crop.

The single cropping pattern is being proceeded by cultivating second and third crops in a year. The dominance and demand of vegetables is replacing food grains (especially paddy) in this area. Rice based cropping systems have low return, although, rice is the main food crops farmers advocate. Singh also advocates that *Rice is the most important food crop in Asia and will remain so for many years to come. However, in marginal and upland areas of Asia, rice-based cropping systems have low returns. Shifting marginal areas out of rice into more profitable crops is seen as a solution*.

The area of red sugarcane cultivation has drastically increased over last five years particular in Saher panchayat. It is mainly sown in medium land instead of paddy due to reasons like high value crop, cope up with erratic rainfall and availability of irrigation facilities. The demand of red sugarcane is equally high due to festival 'Chaath'. Two crops are taken in such fields in a year; one is sugarcane, which is followed by green pea or potato.

The farming is being extended as business for the farmers of the area. There cultivation has shifted from subsistance farming to commercial farming. The profit making farming can be seen in this area. Most of the farmers are lakhpatti in this area. As they are engaged in commercialized agriculture, farmers are cultivating monocrop at a time in large area. They are playing more risk than before. If the crop gets damage due to any reason or the market price get down, farmer faces huge economic loss. Most of the farmers grow early vegetable as well as late from the season to fetch maximum profit. The cultivation of single cropped area has increased. One crop at a time is cropped by many farmers of the area. It enhances to huge loss due diseases or pest infestation in rampant. Farmers of the area are more focused to the market rather than agricultural season. Now, production does not matter for us, but price of the produces does, farmer describes.

IX. Genetic Erosion in Total

Due to commercial agriculture practices adopted by the farmers, every farmers of the panchayat are using hybrid seeds. Farmers are addicted of using F1 seeds in search of maximum yield to get maximum profit as Hammer and Teklu has righlty mentioned 'Yield (or yield potential), which is the characteristics of most modern varieties, is the most important criterion for the choice of a variety by a farmer (Heisey and Brennan, 1991)'. This has resulted into replacement of traditional seeds in this area as per villagers.

The millets crops like finger millets, linseeds, oil seeds like Niger and pulses like black gram are hardly grown by the farmers of the area due to less profitable. These seeds were of obsolete in nature, but are about to extinct from the area. Cereals crops are fully dominated by hybrid seeds. The scented 'Nanka dhan' is not seen in the area, which was meant especially for pulao.

Due to the regular use of hybrid seeds, the traditional varieties of vegetables are fully extinct from the area. According to the farmers traditional varieties are less productive than hybrid, but, they accept that traditional varieties were much resistant to environment adversity, pest and disease. If the production was less, the risk of loss was low too.

X. Emergence of Pest and Disease Resurgence

The package and practices of commercial agriculture has given the birth of the concept 'resurgence' in this area. According to the farmers, it is difficult to control pest if it occurs once. Pest like fruit and shoot borer, white fly, mites, leaf borer are common to all vegetables crops. Blight and leaf curl has become common diseases for all the crops in this area. Farmers start spraying pesticides like cypermethrin, monocrotphos, etc days after one month of transplanting or sowing the crop. This situation has provoked farmers for indiscriminate use of pesticides, acricides, insecticides and fungicides on their standing crops. Herbicides are commonly used in every season. It is shocking to know that the interval of spraying such chemical is 4 days interval and in the case of brinjal, it is 1-2 days. Farmers use more than one chemical at a time to spray on the crop and the dose is 2-4ml/ltr of water per chemical. Such excessive use of chemical lead to hazardous effect on biodiversity (Mahmood *at el*)

However, their crops are highly damaged by pests, Farmers say. According to them, once the pest or disease attacks their crop, it is difficult to manage the situation. And it goes multiply by another field and spread over the area. In 2015, it has been experienced in case of leaf curl in chilly and once it was happened in 2006 in case of late blight in potato as per farmers.

XI. Disjuncture of Agricultural Knowledge

The agriculture has become market oriented and market focused, villagers say. And this all involves the politics of knowledge in this occupation. The 'incomings' of new knowledge has been replacing the local knowledge among the agricultural communities (Arjun Appadurai). This erosion of local knowledge is making them slave under the so called scientific new knowledge. They are becoming handicapped with their mind and depending on market for each and every action of agricultural practices. They used to do self-sustained agriculture by applying animals manure, obsolete seeds and traditionally associated knowledge with it for farming. The rate of risk was minimum due to conditioned knowledge of inputs and environment. This knowledge is vanishing. The culture of doing agriculture is transforming (Arjun Appadurai) rapidly. Subsistence farming is transforming to commercial farming with higher risk that is resulting to farmer's suicide. Because, once they fail to cop up with the market, other no more option opened for them. For instance, the seeds used in agriculture has shifted from obsolete variety to improved variety and then to hybrid variety. Traditional variety and improved variety needs less care than hybrid one and gives at least some result during adverse condition applying low inputs; on other hand hybrid variety needs special care, conducive environment, high input cost and every favorable condition (A.R. Vasavi) but gives better yield in such condition only. The adverse condition gives zero output, farmers describes.

The sufficient data shows that Indian agriculture has been dominated by foreign companies like Monsanto, seminis, mahyco etc. They are mainly seed and pesticide companies. They provide range of seeds like maize, cotton, chilly, brinjal, cabbage, pea etc around the country and all are hybrid seeds. Now, the market is in their hands, they supply all the seeds and they have only the technical knowledge to grow such hybrid seeds. As Avavasi advocates that farmers uses to of growing hybrid crops in this hybrid time in their field. In such critical situation, the input cost will be decided by foreign companies because famers are dependent to such companies. This is the reason that the cost of hybrid seeds is high because no one has to say anything and cost of cultivation keeps on growing up. In this vulnerable situation, two things can happen. First, if companies withdraw from India, Indian agriculture will die. Second, companies may blackmail to raise agricultural input every year seeing the first situation.

The knowledge politics of market for each activity for agriculture widening equality gap among the farmers. The better access to resources is making the farmer richer and lesser access making them poorer. Famer's do not have any

hold. If the input manufactured company increases the price of inputs famers have to purchase. This nature of agriculture pushing the farmer's to change their profession from agriculture to non-farm sector to earn better livelihoods (Dilruba Khatun and B.C.Roy). There are many study reveals of it that the rural-urban migration has significantly increased over the period of time. People generally migrate in search of alternative employment towards the city. The most rewarded occupation of the villages is in the stage of withering. The particular group of the village who were identified with the occupation is disappearing; likewise the culture of a village is vanishing (Dipankar Gupta). Agriculture has been perceived non- profitable profession. Talking about the rural youth, they do not want to be in old occupation if they get chance to get out of it. Agriculture has become failed aspiration of the rural youth. They do not want to make career on it. The demography of Indian agriculture is changing fast (Amrita Sharma). Young generations of the population are unable to understand the agricultural trend of the market.

XII. Scenario Changes, Water Still Matters!

In this area, one can find dried wells and ponds in the summer season, but will see small huts here and there in medium lands. Those huts are the indication of bore well made up by farmers for rabi and zaid crops without any financial support. Earlier, there were well used for irrigation purpose but, used to dry in middle the period of crop harvest. The diesel and kerosene oil were used as fuel around 10 years back. The cropping areas were limited due to limited irrigation water. Land remained fallow after paddy harvesting in low and medium land. The scenario has fully changed. The diesel and kerosene pumps are kept inside the home and became non-functional. We will hardly see such machines in the agricultural field. The introduction of electricity has replaced them. All the farmers are using electric pump for irrigation for their crops in kharif, rabi and zaid, according to the villagers.

No doubt, the cropping area has drastically expanded since last 7-8 years in this area due to use of deep bore well for irrigation purpose. The use of deep bore well has also reduced the cost of cultivation by using electric pump rather than fuel pump. The average depth goes to 400 ft inside the ground and the average cost comes 1.5 lakhs rupees. The number of deep bore well can be counted more than the well dug before. These bore well are not only used for vegetable cultivation, but, are used for irrigating paddy seed bed to irrigating paddy of low-medium land during monsoon breaks in kharif season. If monsoon get late, these bore wells are used to transplant paddy on time, which was hardly seen before that resulted into crop loss, farmer says.

The multiuse of bore well water can also be noticed here. With using bore well water for crop husbandry purpose, water is also used to sale for drinking purposes in social functions as well as for drinking water in household. Sometimes, this water is also sold in per hour pump-out basis to other farmers. It is also used for share cropping, where bore well owner gives water and seed while other farmer contributes land and labour, rest costs are contributed by both of them till harvesting.

Such uses of bore well water has promoted over pumping out of water from the ground. Bore well keeps start day and night till electricity get off for irrigation purpose. There are more than 50 bore wells runs in the same way from March by the onset of monsoon. The over pumping out of gravitational water has resulted into depletion of ground water since last five years and it can be experienced by all the villagers of the area. Some of the deep bore wells used to dry in the peak summer from 2nd week of May, which also causes crop loss. The well of this area get dry without any use by end of March or 1st week of April itself. It largely affects household chores and drinking water for both cattle & humans. The situation becomes so pathetic and problematic on the time, when electricity gets off the day, villager adds. The power comes to less than 50 people for supplying drinking water to more than 1000 population. The critical situation can be visually experienced in the morning and evening of summer, when farmer starts the bore well for irrigating agriculture field, but all the water is taken in utensils for drinking purpose. Such situations become so irritating for the farmers like those, who don't get water for drinking. Ten years back, farmers were looking for water for agriculture use, now everyone is looking for water for drinking purpose. Nothing has changed. Summer remains summer. Water still matters!

XIII. Conclusion

Unarguably, Agriculture is the backbone of our country. Jharkhand's agriculture is largely rainfed in nature and assured irrigation is available to approx. 28% of total cultivated area. Rice is the major food grain crop of the State covering approximately 80% of the total cropped area. The farmers of Saher panchayat of Ranchi District has undergone major shift from Subsistence farming to commercial farming. The area of paddy crop cultivation is shrinking and the cultivation of vegetables crop are dominating the same due to profitability as well as erratic monsoon. The agriculture has fully become market centered and profit oriented. This has led to genetic erosion as well as well as loss of local knowledge. The use of chemicals has introduced pest resurgence in the area, Due to bore well used for irrigation, well and ponds are dried just pre summer, which has resulted into huge scarcity of water for human as well as animals of the area. Even, Bore well has started to dried up.

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