

## **A Study on Agriculture Diversification in Jharkhand**

**Dr. Bidyanand Choudhary**  
**Assistant Professor**  
**Dept. of Economics**  
**J.N.CollegeDhurwa, Jharkhand, India**

### **Abstract:**

Due to its significant proportion of jobs and livelihoods, agriculture is the backbone of the Indian economy. Agriculture's GDP proportion has declined steadily; however, the sector supplies more than 50% of the entire population in the country with direct jobs and a considerable proportion of the population is dependent on agriculture industries and the trade in products. About 60% of our country's population is rural, and agriculture is the main occupation. A considerable amount of the country's land is therefore utilised for farming and allies. If, via mechanisation, modern technology, productivity in agriculture and horticulture improve, this industry can play a significant role in India's economic development. Sustainability of agriculture for highly valued cash crops and cattle production thus requires time. Although rich in minerals, the Jharkhand economy is largely agrarian with 71% of its population depending on agriculture for their livelihood and 43% of income from agriculture. This region's agriculture is distinguished by its poor productivity and a protracted period of almost stagnating growth. Investment in rural facilities, such as irrigation, rural roads, electricity, market development etc., have been neglected in the region. The soil and the geography of the groundwater rivers are not as harsh geophysical conditions as many other parts of our country, but they have attained great productivity and growth rates in farming via the exploitation of resources. The Jharkhand region has mostly untapped its potential for agricultural development. The same can be used with substantial rural infrastructure investments.

**Keywords:** Agriculture, Jharkhand, Diversity, Horticulture, Poverty.

### **Introduction:**

Indian agriculture currently differs from green revolutionary agriculture. During the Green Revolution period, agricultural growth was mostly achieved by supply-driven political tools, like irrigation, power, extension services, price support. In the post-reform period, farming growth was driven by demand, urbanisation, per capita income and changes in consumer preferences. Many farmers are still dependent for their living on traditional food crops. The area's contribution to output growth dramatically reduced the growth of the gross area cultivated by duplicating it. Because of the low yield and poor value of the ground cereals, high-value oils, and rice and wheat have been replaced without hurting the food grain output.

Adams and Bumb (1993) and Singh and Singh (1993) explored the growth rates of area output and productivity. Berabih and Herdra (2007) studied the use of low-level farming technologies as a key driver of the reduction in productivity, the hazards associated with natural occurrences such as streams and disease outbreaks. Consequently, development to increase production of the land. Provider of horticulture production to enhance farmers' participation in the market and the possibility of intense production. Deogharia (2011) concludes that in Jharkhand, the horticulture sector has enormous potential and marketing system improvements are necessary for enhanced agricultural aggregate production [2].

In the post-Green Revolution, the agricultural sector diversified towards crops with a better yield growth which was marked by technological diversification. Many areas have been switched to valuable food-grain crops such as rice, wheat and maize. In various countries in the country, this has led to new situations for specialisation. Surprisingly the agricultural production was very unpredictable compared to the 80s as well as the agricultural expansion slowed down in the 1990s.

The annual gross capital formation rates fell substantially between the beginning and the late 90s, and, at the same time, there was a falling trend in state investment in agriculture (from 33 to 22 per cent). Furthermore, there have been several concerns about traditional food baskets that favoured the mix of rice and wheat and specialised in cultivation design.

These concerns relate mainly to the increased risk of agricultural income and the negative environmental degradation externalities and geographical imbalances caused by the farmer. On the one hand, agriculture's contribution to GDP decreases overtime while the number of people involved in farming and its associated activities continues to grow and raise worries about land and labour productivity. Therefore, the policymakers have started to focus on modifying how farmers operate to deal with negative externalities that they produce while also finding means of eliminating discrepancies and improving food safety levels for impoverished and undernourished people. This requires alternate systems of production or opportunity, which can create new jobs, growth and increase revenue.

The main source of aquaculture resources is in Jharkhand reservoirs (115000 acres). Tanks are considered as key development focal resources (85% of private-sector tanks having a 72% share of TSA). The fisheries sector is another animal activity used to increase income, jobs, production and ecological well-being in its entirety. Promoting fisheries among the rural population has resulted in 1.16 lakh tonnes of fish being produced annually. The Government wants the cage culture and R.F.F. to increase the fisheries. It is intended to promote it through the distribution of local fish feed. Fishing among young people is promoted by giving incentives. In addition, output insurance and residency are offered to the fisherman. It is also promoted as a primary source of livelihood through Panchayat among the youth. In 2014-2015 and 2016-17, Jharkhand fish production, manufacturer and fish seeds increased. In this era, Jharkhand fish production grew from 1.04 lakh metric tonnes to 1.45 lakh metric tonnes. Their growth was 39%. The fish producer grew from 0.86 lakhs to 1.28 lakhs between 2014-15 and 2016-2017. In the timeframe concerned, the fish manufacturer has seen a 48% gain. The production of fish seeds in 2014 amounted to 108 crores, which rose to 415 in 2017. Over 200 percent rise was seen over this period.

### **The agriculture sector in Jharkhand:**

The state of Jharkhand is divided into three sub-zones and falls within agro-climate zone VII (Eastern Plateau and the area of Hilly). Annual rainfall in the state is 1200-1600 mm, and the climatic range extends from dry semi-wet to moist semi-arid types. Huge state and rainfed farming sequences resulted in huge soil degradation, diversified agriculture techniques and poor yield. Around 82% of the annual monsoon rainfall occurs in the mid-June through September season. Different cultivation systems used by farmers are offered moisture through the whole monsoon period. Jharkhand soils are generally low or extremely low in accessible phosphorus and sulphur, medium in nitrogen and potassium, and poor in boron. Around 1.6 million hectares (19 percent of the total area) are acidic. The region has a severe problem with mild to severe soil erosion, since 74% of the land is on very gentle to mild paths.

The area cultivated and the cultivation intensity are low in spite of good rainfall. The technological adjustment level is likewise weak, leading to reduced production. Area of about 3.8 million hectares is anticipated for cultivation while the net area sown is 2.56 million hectares and only 12 percent of the crop is irrigated. The country's total cultivable land is 52% compared to 55% of the nation, but only 43% is under net seed compared to the national average of 76%. The whole country suffers from various important loopholes in agriculture and related industries, yet the state has various options to make agricultural production autonomous.

While many farmers remain dependent on the livelihood of traditional agricultural food crops, 50% of GDP is produced by horticulture and live stocks [3]. It is time to get policy assistance from conventional low-value crops to high-value vegetable and livestock commodities to diversify agricultural activities. Diversification of farming activities is a significant strategy for obtaining

increased income and job growth in agriculture. Politicians also emphasise that the way agriculture operates is changed to deal with the contradictions in the agriculture sector and attain food security. Against this background, the diversification of agricultural activities towards high-value commodities (HVCs), such as fruit, vegetables, diaries, fish products and poultry, is suggested as a viable solution for stabilising and increasing farm incomes, enhancing farm growth, increasing jobs, and conserve natural resources.

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The diversification of agriculture indicates the changes at household level in crop, enterprise and activity mix [1]. A move from monoculture to a large mixture of crops and animals is contemplated. Different reasons lead to the need for agricultural diversification. Since a large number of farmers' suicides have occurred in several places of India, diversifying the mix can be an effective technique to reduce the influence of risk on the welfare of farming. Diversifying also means that Indian farmers are able to provide high-value horticultural and animal produce for rising wealthy foreign and domestic consumers. In addition, the domination of the wheat-paddy crop system has resulted to major economic, social and environmental challenges, such as decelerating productivity development, a fall in agricultural self-employment, exploiting groundwater and degrading soil fertility [4].

**Diversification of Agriculture in Jharkhand:**

Jharkhand is well-known for rainfed mono-grown rice agriculture. Frequent drought interval, low precipitation in cultivated years and protracted dry spell force farmers to shift to low-water crops such as pulses, oleaginous seed and cereals such as Ragi and Jowar. Diversified crop pattern and aids in the management of crop failure risk and uncertainty [5]. Support must be increased to optimise inputs and reduce costs in rainfed areas. Low paid cultivation costs represent a risk reduction technique in a high-risk circumstance. As the irrigation potential increases, farmers have been cultivating 2-3 crops according to the scenario. If we are covering various crops for the last 3 years, it reveals that the area of pulses and oilseeds has increased while the area of rice has decreased.

Sl.No.	Crop	2011-12	2012-13	2013-14
1	Rice	1693.796	1414.462	1255.873
2	Totalpulses	538.784	586.995	566.841
3	TotalOilseed	263.470	2250.586	275.816

Table 1: Year-wise and Area Wise Coverage of Crops in Jharkhand

Table 1 shows a gradual reduction of the area below rice and a growing area of pulses and oily seed. Pulses and oleaginous crops replace rice grown upland and a part of medium-sized soil. The change in plumbing pattern and the benefits: cost ratio of the crop grown by the farmers reflects crop pattern adjustment. Pulses and oleaginous seeds are cheap inputs and low water, which require crops, on the one hand, and on the other, require less care and management compared to rice, which makes oleaginous and pulse crops available to farmers.

In agro-climate Jharkhand state, the majority of pulses and oilseed crops are cultivated. The cultivation of these varied cultures is nearly viable by developing the high return/ hybrid cultivar of pulses & oilseed crops and adopting the practise package by most growers as a result of the lower risk with low investments.

**Crop diversification in upland:**

Land is designated as Don in Jharkhand Agricultural (Up low land) In the State where rice was cultivated, and unbundled highlands make approximately roughly 0.2 million ha. With higher rice efficiency on medium and low land, with more water available, there is a means to diversify the rice system on the highlands. The ideal solution is to replace the upland rice system, with increased yields of millet, pigeon pea, blackgram, cowpea, bajra, sorghum, peanut, and maize as single plants and as intercrops.

In Jharkhand, horticulture plays a significant role. Jharkhand has almost anything to grow here with the necessary climate and soil. The territory is wide and long. The region. By providing farmers the horticultural skills and scope for prospective entrepreneurs, the state government, with the backing of the Horticulture and Agro-Forestry Research Centre. This industry can lead the development of the Jharkhand economy by enhancing horticulture with the support of the mechanism advance technology.

In view of its contribution to national revenue and employment generation, horticultural growth has added significant importance in a portion of agricultural goods. The growing of vegetables delivers substantial returns from an economic point of view. Horticultural crops, including vegetables, offer roughly four times the income of food crops per hectare (Srivastava, 1993). The Government was pressed into the diversity of crop plans by increasing income elasticity and demand for veggies. The development of these crops was therefore highlighted in various five years' programmes.

Fruits	Area(000Ha.)		Production(000metrictons )	
	2015-16	2016-17	2015-16	2016-17
Bael	0.52	0.53	35.59	36.22
Aonla/Gooseberry	0.28	0.29	1.31	1.41
Guava	8.10	8.17	80.05	88.84
Banana	12.53	9.06	33.28	31.63
Ber	0.48	0.64	2.83	10.41
Jackfruit	12.33	14.74	117.46	124.77
Litchi	3.45	7.01	40.01	47.80
Mango	50.41	50.56	393.67	438.
Papaya	1.78	2.53	106.69	109.88
Pomegranate	0.01	0.01	0.04	0.01
OtherFruit	1.80	1.70	102.54	104.50
LimesandLemons	4.84	5.55	47.74	53.96
Total	96.53	100.79	961.21	1047.97

Table 2: Area and Production of Different Varieties of Fruit Crops in Jharkhand (Area in 000 ha and production in 000 metric tonnes)

Different fruit kinds were manufactured in Jharkhand from 2015-16 to 2016-17, followed by litchi, limo-lemons, mango, guava, and amla/goosebeer. The largest proportion was increased during the corresponding period. In fruit plants of pomegranate and banana there has been a drop in productivity. The changes in areas of different fruits between 2015-16 and 2016-17 have shown that litchi has the greatest growth percentage and other fruits, such as papaya, ber, jackfruit, limes and lemon, have been followed (Table 02). In contrast, during the relevant era bananas have witnessed a decrease in the area.

Vegetables	Area(000 ha.)		Production(000metrictons )	
	2015-16	2016-17	2015-16	2016
Beans	10.38	12.62	154.55	226.72
BitterGourd	1.42	1.60	12.31	13.20
BottleGourd	1.63	1.55	13.96	13.34
Brinjal	22.96	80.05	219.65	241.00
Cabbage	30.50	19.32	475.99	322.46
Capsicum	18.63	2.95	17.35	32.55
Carrot	0.65	1.06	6.97	11.65
Cauliflower	20.70	21.19	258.64	292.17
GreenChilly	11.99	14.79	144.84	180.65
Cucumber	0.37	1.68	25.70	18.55
Kaddu/Pumpkin	0.27	0.77	3.60	18.56
Okra/LadiesFinger	32.87	4.84	452.12	101.47
Onion	14.86	17.48	254.63	292.59
Peas(Green)	13.85	15.19	192.21	341.88
Potato	44.93	52.73	627.01	668.66
Radish	1.05	2.81	11.73	39.85
Tomato	18.16	19.75	230.19	231.46
OtherVegetables	19.00	23.15	272.36	323.26
Total	264.22	293.53	3373.81	3370.02

Table 3: Area and Production of Different Varieties of Vegetables in Jharkhand (Area in 000 ha and production in 000 metric tonnes)

Table 3 shows that between 2015–16-2016-17, Kaddu/Pumpkin experienced a max. Percentage rise during the period following radishes, capsicum, carrot, peas (green) and beans in production of different fruit kinds in Jharkhand. This is followed by Table 03. In chocolate, cucumbers, okra/ladies finger and bottle gourd, production decreases were noted. For the period 2015-16 to 2016-17, the percentage variation in area under various vegetables shows cucumber has the most growth rate, followed by other vegetables like brinjal, kaddu/squash, radishes and carrots (Table - 03). Whereas

during this period, the area has declined, with capsicum, chocolate and okra/ladys finger. Diversifying crops into cash crops such as vegetables must be accompanied by a better farmers marketing system. Unless production increases lead to rising farmers' earnings and ensure pay prices and fair dealings in the disposal of their goods, initiatives to boost vegetable output can not continue for long.

#### **Production of animal husbandry:**

Inadequate nutrition, low animal management, tropical heat and sickness typically lead to small productivity for Jharkhand animals. The Animal Husbandry Division is aimed at developing it as a source of benefit through the correct development of animal husbandry by boosting the production of animals. This division is responsible for matters related to animal production, preservation and disease protection, stock enhancement and milk development. It also deals with all topics related to fishing, inland and maritime fisheries. This department's aim is to improve livestock production like milk, egg & meat, improve drawn bullocks by intensive implementation of controlled breeding programmes, consolidate and reinforce existing state-owned livestock development facilities, encourage animal husbandry as a viable subsidiary source of revenue for rural people by providing support for livestock development.

The overall livestock and poultry population of the state of Jharkhand amounts to 18.10 and 11.23 million; the animal cattle (8.78 M) and the goat (6.59 M). There is also a large disparity in production and the need for livestock goods like cow's milk productivity of about 1.59 kg perday compared to the national average at 3.0 kg / day. The output of livestock and poultry in Jharkhand is quite poor. The annual per capita availability of milk, meat and egg, compared to the national average of 96.0 kg, 3.32 kg and 51 eggs, is 47.45 kg, 1.42 kg and 13 eggs in Jharkhand accordingly.

#### **Potential for agricultural growth:**

There is a good potential in Jharkhand despite severe geophysical circumstances, for increasing agricultural production and diversification. The region possesses 482 crore cubic metres of groundwater potential a year, but only 4.1 percent have so far been used for agriculture. The farmers used mostly shallow water by open dug wells [7]. The lack of boiling facilities means that much of the deep aquifer is yet untouched. Unless the Government provides this service at the subsidised rate, impoverished farmers in that region will not be able to use the rental services of drilling equipment. It can be noted that vast areas of the country's Deccan region, Haryana have been using high acquifers from 150 to 200,' with a very high level of exploitation by ground water, 80.2% in Haryana, 60.4% in Tamil Nadu, 23.8% in Andhra Pradesh, 26.9% in Karnataka and 15.3% in Kerala.

There are few permanent rivers in Jharkhand, and up to January- February, there are many water rivers that can be used for canal irrigation. Some rivers such as Amanat, Auranga, Sankha, (ihaghra, etc) were identified beforehand by the Government for canals construction, but due to the lack of money, the works were not followed up. Moreover, at least during the rainy season, there are various rivers and water reservoirs containing water. Its water can be irrigated by lifting irrigation systems. In that location, for this purpose, Bihar Hill Area Lift Irrigation Corporation (BHALCO) was established. So far, the company has built a total of 374 elevator irrigation schemes totalling 53 795 acres with an actual irrigation area of 3094 acres. For lack of repair and maintenance, non-provision or unpredictable electrical supply and wire robbery, most systems were inoperative.

An expansion of the irrigation facility would unleash agricultural growth forces in Jharkhand. A recent research by Ramjan Ansari on the medium irrigation project in the district of Gumla in that area showed that the yields for all crops were far greater in the area of the project than in the non-project area alone except for ragi. The return of the largest crop is 60.3 percent greater, while corn was 30.5 percent higher. The growth in returns from other crops ranged between 7.1% and 21.7%. Furthermore, the use of fertiliser per hectare, 66.7 kg in the project area and 21.3 kg in the non-contracting region, was significantly greater. The coverage of HYV seeds in the project region was

58.4%, 77.9% for paddy, and 92% for wheat. The respective figures in the non-project area were 21.3%, 55.6% and 71.8%.

Recently, the Jharkhand area has become a major horticulture product producer. Market for these products was developed in urban consumption centres in and around that region. The farmer has exploited the opportunity of cultivation, not only in the regional markets (Ranchi, Jamshedpur, Lohardage, Daltonganj, Garhwaetc), but also in far away regional markets such as Calcutta, Rourkela, Bhilai etc., by developing road and transport facilities. Products are being distributed to local markets. The irrigation system development would further enhance vegetable and fruit agriculture, including papaya, mango, lichi, etc. The scientists at the Birsa Agricultural University found high yield types of diverse crops that are expected to give 2-3 times the farmers' current production in this region. The extension of the irrigation system will give farmers the opportunity to use these varieties and to boost their farm produce significantly.

Agricultural diversification can increase farmers in this region's low revenues by means of activities such as dairy, poultry cultivation, piggying, fishing, orchards etc. Local demand for milk, eggs, meat and fruit is good, yet local supply does not meet this demand. A great deal of these products are sold in other countries, such as Tamil Nadu, Andhra Pradesh and Karnataka.

In order to harness the potential for agricultural expansion in Jharkhand, the Government must make a significant investment in the construction of infrastructures such as irrigation, watershed programmes, rural roads, rural electrification, etc [8]. However, many rain water flows into the river because of the undulating and slope of the soil surface. Water and soil conservation has started in the region with the watershed development programme of bonding, water collection, social watersheds, and agricultural forestry [9]. However, progress in the program's implementation was late. Approximately 70% of Jharkhand's villages have no electrical or sporadic electricity and 65% of them have no access to cities and mandis via all-weather highways. Their power supplies are non-related. Only 20% of all mandates were subject to market legislation, yet market regulatory provisions were not strictly complied with. In the agricultural markets the traditional sales strategy and mispractices continue so that farmers do not get a reward for their products. Most mandis have no market yards, godwons, cold storage facilities and classification facilities. Due to the shortage of storage in the mandies, farmers have to sell the product on the same day, albeit the prices are unfavourable.

#### **State government steps:**

Jharkhand state government took initiatives to improve agriculture and its associated state sector. These methods can allow farmers to achieve jobs and extra incomes for generations of farmers. The steps done in several areas are:

##### **a) Horticulture**

- Udhvaan Scheme for Development The plan is designed to build and expand state nurseries. It has nourishing fruit, veggies and plants. The nutritious level of fruits and vegetables, flowers, banana and house gardening, will be further developed. The plan for 2017-18 envisaged an allocation of Rs 5000lakh.
- Mission for Gardening The project seeks to improve gardening in 17 neighbourhoods. The Mission attempts to extend horticulture to areas not previously covered: Dhanbad, Koderma, Bokaro, Jamtara, Godda, Deoghar and East Singhbhum. For the 2017-18 plan, an allocation of Rs 2100 lakh was suggested. The state has a particular advantage in cultivating a large variety of vegetable crops. In all, Jharkhand has shown a growth of over 29% over the last five years in the area of horticulture crops in the state, compared to 15% at national level. The following areas need to be targeted to develop horticulture in the state:

(i) multitier cultivating system

(ii) high-density orcharding and fruit-based rejuvenating technology

(iii) Additional land for fruit crops to bring 0.02 million hectares.

(iv) For post-harvest processing of vegetables and added value of products, improved packaging and fast transport systems with cold chain should be established.

#### **b) Livestock Management and Development**

The management of cattle needs to be shifted away from the virtually exclusive concentration on high yield races. Ample livestock systems must be strengthened, depending entirely or in part on commons and residues in agriculture. Improvements in animal health, feed, forage, potable water, shelter, institutions etc. are necessary. This sector has enormous economic value in underprivileged areas. However, for these huge livestock systems relatively little public support is available. Developing a robust food basis demands significant efforts and innovations to protect, manage and share usufructs in the institutions. Seasonal surpluses in the production of milk must be leveraged financially by building an enabling product diversification infrastructure.

Notwithstanding a large number of reasons in this sector today, weak genetic potential, enormous shortages in feed and fodder, the lack of institutional support for improvement, health monitoring, and the like will be a vital part, in seasons of non-cropping, of tribal agriculture in our country. The livestock development or the development of the agriculture-allied sector should therefore be given more attention. In this section, the advancement of several areas is discussed.

#### **c) Aquaculture**

In the state, species performance and fish productivity are changing significantly in different places and ultimately, farmers benefit. The diversification of aquaculture and the cultivation of cages have opened a new feed-based field. The state distinguishes comprehensive scale promotion by members of Fishery Co-operative Societies of reservoir cage farming in a participatory way. The production was demonstrated to be more than 3 MT. per 96 m<sup>3</sup> cage. In several reservoirs, the state has floated almost 1500 cages, with another 2000. The need for formulated factory fish feed is around 18,000 MT per annum. Farm produced fish feed is used in the state at about 18000 MT. Traditional farmers also use factory-formulated fish feed as better results are obtained.

#### **c) Dairy Development**

In order to bridge the gap and boost self-support, the administration has suggested increasing milk production. It advocated that bovine animals should be increased by giving panchayat-level artificial fertilising of dairy cattle. The existing 1440 centres should be upgraded to 2500. The administration wants to provide women particular help. Rural women receive cash support and training for around 50,000 B.P.L. This is achieved through the provision of two cows with a subsidy of 90%. They are also tied to self-help groups, who involve people in financially independent economic activity. For milk production programmes that boost dairy production, revenue and employment of women, rural males are tied to the members of SakhiMandali.

#### **d) Backyard Poultry Farming**

Government farms for any appropriate NGO/SHG mother unit that will bring birds up for 28 days will be provided. There are 28 chicks given to beneficiaries to guarantee their participation in chicken production in the backyard. The farmer will bring roughly 50 birds, i.e. 72 weeks, up to maturity. The NGO/SHG, responsible for maintaining the mother's unit in this district, will collect eggs produced or culled in recipients' homes, thereby ensuring a retroactive as well as forward association. Creation of new hatcheries for poultry in every State division.

#### **Conclusion:**

In 2014-15 (based on prices in 2011-12), the agriculture sector made a 16.2% contribution to Nation GDP compared with 15.2% in the 11th plan. The population of the country should stabilise by 1.6 billion by 2050. Therefore, land, water and other natural resources per capita are expected to continue to decrease. Instead, biotic pressures such as floods, drought, and other such as insects - pests and

diseases are on the increase. Therefore, those countries and the Centre's joint efforts would be required to meet the future anticipated food grain requirements of 277 million tonnes by 2020. This is particularly crucial because of the crisis of often occurring weather aberrations and natural disasters. The problems connected to risk management, subsidies for food and fertilisers, land policy, diversification, investment, prices and procurement of agricultural products must be given priority. In addition to these reinforcement of supply chains, it is also vital to boost non-farm revenue and infrastructure and support services and boost agri-research & development. In order to address these concerns, NITI Aayog is established as an Agricultural Development Task Force chaired by the Vice President.

The flagship programmes, which are directly linked to agriculture, are those of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), the Rashtriya Krishi Vikas Yojana (RKVY), the National Horticulture Mission (NHM), groundwater artificial refilling, water repairs and water bodies restructure. CSS will involve the pooling of human resources and capital, the transfer of production and eco-friendly technologies and added value through providing retroactive and forward links. Some political challenges must be handled.

#### **References:**

1. Sharma, H. R. (2005), "Agricultural Development and Crop Diversification in Himachal Pradesh: Understanding the Patterns, Process, Determinants and Lessons", *Indian Journal of Agricultural Economics*, Vol. 60 No. 1, pp. 71-93
2. Vyas, V. S. (2006), *Diversification in Agriculture: Concept, Rationale and Approaches*, in Mujumdar, N. A. and Kapila, U., (eds.), *Indian Agriculture in the New Millennium*, Academic Foundation, New Delhi, Vol. 1, pp. 245-25.
3. S. C. Tewari (1987), "Horticultural Development in India" *Journal of Agricultural Economics* Vol. 42, No. 4, Oct. 198
4. Chand, Ramesh (1996), "Ecological and Economic Impact of Horticultural Development in the Himalayas: Evidence from Himachal Pradesh", *Economic and Political Weekly*, Vol. XXXI, No. 26, pp. A93-99.
5. Barghouti, Shawki; Kane, Samuel and Sorby, Kristina (2007), "Poverty and Agricultural Diversification in Developing Countries," in Joshi, Gulati and Cummings Jr., (eds.), pp. 87-128.
6. Krishna, Anirudh, M Kapila, M. Porwal and V. Singh (2005). *Why growth is not Enough: Household Poverty Dynamics in Northeast Gujarat, India*. *Journal of Development Studies*, Vol. 41, No. 7.
7. Bhalla G.S. and Singh G. (1997), "Recent Development in Indian Agriculture " A State Level Analysis" *Economic and Political Weekly*. Vol. 1, XXXII No. 3.29 March.
8. Barghouti, S. Kane, S., and Sorby, K. and Ali, M. (2004), "Agricultural Diversification for the Poor, Agriculture and Rural Development", Discussion Paper, No.1, ARD Department, World Bank, Washington DC
9. Thakur, R, N., (2010), *Nature and Pattern of Agriculture Diversification in Bihar and Eastern India*, in Roy, P.K. and Sharma S.P., (eds), *Globalization and Agricultural Diversification of India*, Regal Publications, New Delhi.