

Changing Patterns of Agriculture in Uttarakhand State from 2010-2020

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Abstract

Agriculture is the backbone of the State economy and an important contributor to SGDP. It is losing its status as it is subject to different constraints. This paper attempts to explain the present agriculture scenario of Uttarakhand and the Changing patterns of agriculture in terms of cropping pattern production and the number of holdings. The current situation is not satisfactory in terms of food grains as the area under these crops has shown disturbing trends and the farmers are losing their interest in the farming sector. Landholding size per family and field sizes have both decreased markedly during recent years. Agricultural development has been sluggish and has failed to keep pace with population growth. In recent years the yields of major food crops in Uttarakhand have been lower than in other South Asian countries and Uttarakhand is now dependent on food imports. Crop productivity in the hills has declined due to land degradation. Changes in agricultural practices (including changes in crops and crop production, and impacts of livestock overgrazing) are having major and far-reaching impacts on the natural environment.

Keywords: Agriculture, Changing Patterns, Uttarakhand.

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I. Introduction

The agricultural sector plays a dominant role in reducing poverty in comparison to other economic sectors. The structural transformations taking place in developing economies initially saw a migration of labour from the agricultural sector to the manufacturing sector or the non-farm sector. As In Uttarakhand, the manufacturing and the service sectors have proliferated in recent times but agriculture continues to be the prominent sector engaging directly or indirectly with the bulk of the population. Development in the agricultural and allied sectors contributes to the growth of the secondary and tertiary sectors through a feedback mechanism of demand and supply between the sectors. Agriculture is a state subject and therefore the onus of its development and ensuring the welfare and well-being of those associated with the sector, largely remains a state responsibility. The challenges that the State experiences are mostly due to its heterogeneous geography and varying ecology. Therefore, it is evident that any major policy initiative for the agriculture and allied sectors will be considered growth-promoting. The allocation for the sector from the State exchequer may have dwindled. This may jeopardize those engaged in the sector and hurt long-term economic growth. The task, therefore, is to highlight the role the sector plays in taking the State economy to higher levels and at the same time, identify the factors that have been detrimental to the growth of the sector and have limited the income and welfare of its stakeholders.

According to Census 2011, 30.23 % of the State population is concentrated in the urban areas and remaining in the rural areas. Of the total geographical area of 53,483 sq km, 86 % is a hilly area and 63.42 % is under forest cover (38.12 lakh hectares in 2018-19). It is primarily due to the terrain that very limited agriculture is practiced in the State, and therefore the net sown area is a little over 11 % of the total reported land area.

There is a decline in the net sown area as well as area sown more than twice a year. The State has a 69.77 % rural population of which 67.90 % are residents of the hill districts. In comparison to Census 2001, the population in the hill districts has fallen from 68.40 % to 65 % in Census 2011.

Objectives of the Study

The main objectives of the study are:

- 1) To Study the Present Situation of Agriculture in Uttarakhand State.
- 2) To Study the Changing Patterns of Agriculture in terms of cropping patterns and the production of various crops in Uttarakhand State.

II. Methodology

Looking at the objectives of the present study. We have used secondary data. Which is directly collected from different Government sites such as the Ministry of agriculture and farmers' welfare, the Government of India Directorate of statistics Uttarakhand Etc, The Data were collected regarding the cropping Patterns, Area Under Different crops, Average landholding, and consumption of fertilizer. To fulfil the study's objectives, we used descriptive statistics to analyse the changing pattern of agriculture in the state from 2010 to 2020. The statistical tool such as percentage growth to represent the data we used the bar diagram, line bar Histogram, etc. for the analysis of data we used M.S Word, Excel

Agricultural Profile of Uttarakhand

Most of the area of the State is under forests and wastelands thus leaving only a small amount of land which is 7.41 lakh ha (about 14%) for cultivation out of the total reported area of 56.72 lakh ha. About 89% are under small and submarginal out of the total. A large number and area are under small and marginal holdings, the scale of economies cannot be availed of, and so the input cost per unit of output is higher. The soil of the Tarai region is very fertile and supports several crops. Indiscriminate use of chemicals and overexploitation of groundwater makes the soil of this region less fertile, causing a reduction in the sustainability of productivity. On the other hand, the hill region is prone to constant soil erosion due to steep slopes making it less and less fertile, which could be achieved through the adoption of better management practices. In the state, farmers adopt generally two types of agricultural practices i.e. the rainfed and the irrigated. Most of the agriculture in the state is rainfed. The net irrigated area of the state stands at 3.38 lakh hectares (2009-2010). The net irrigated area to net sown area for the state is 45 percent. Being a large area under hills, irrigation is available mostly in the plains and valleys. So there is a need to generate alternate sources of irrigation to increase the net irrigated area, which in turn shall also increase the cropping intensity of the state. These alternative sources can be rainwater harvesting, check dams, hydram for lift irrigation, etc. Technologies like drip irrigation, sprinklers, etc. can also be used for better water management.

The growth of food grain production is quite variable in different areas. As a result, the agriculture scenario presents a mixed picture. Productivity of districts Udham Singh Nagar, Haridwar, Nainital (plain), and Dehradun (plain) is very high, on the other side; productivity of the hilly area is very low, although the valleys are fertile. Plains and hill agriculture stand in stark contrast to each other. While productivity in plains can be compared with agriculturally developed regions of the country, productivity in hills lags far behind. The Green Revolution had highly benefitted the farming system of the plain area of the State while it has neglected the hilly region.

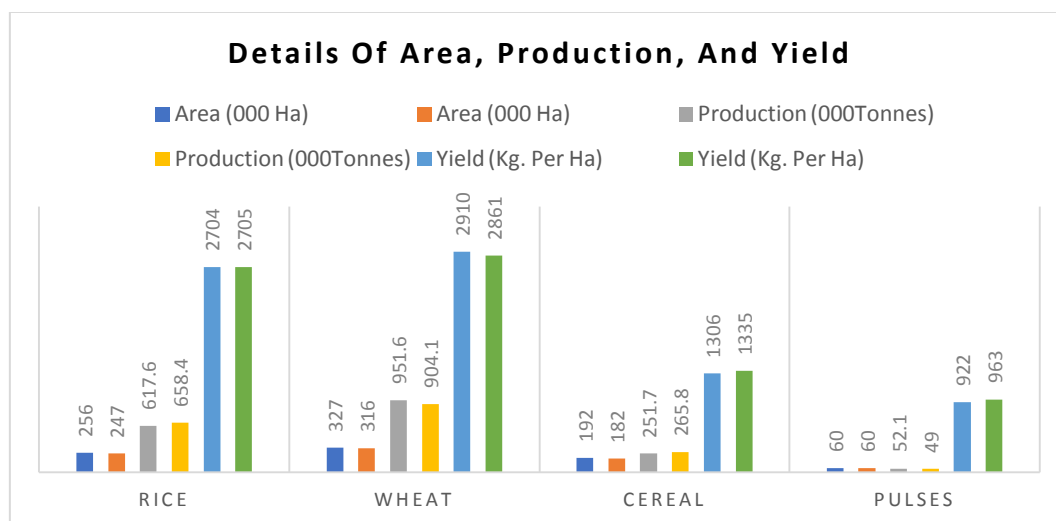
Besides the threats, there are ample opportunities for increasing production and productivity, especially in the field of pulses and oilseeds, availability of cultivable wasteland, and conservation of rainwater harvesting activities. There is also a good opportunity for organic farming, diversification of agriculture, post-harvest technologies, strengthening of market interventions, and use of farm machinery to make agriculture a more profitable occupation.

Present status of agriculture in Uttarakhand State

Cropping pattern and Production of different agriculture commodities						
Table No:1.5 Details of Area, Production, and Yield						
Crop	Area (000 Ha)		Production (000Tonnes)		Yield (Kg. Per Ha)	
	2019	2020	2019	2020	2019	2020
Rice	256.0	247.0	617.6	658.4	2704	2705
Wheat	327.0	316.0	951.6	904.1	2910	2861
Cereal	192.0	182.0	251.7	265.8	1306	1335
Pulses	60.0	60.0	52.1	49.0	922	963

Total	835	805	1873	1877.3	7842	7864
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Source: Ministry of Agriculture and Farmers Welfare, Government of India 2019 -20 .



Source: Ministry of Agriculture and Farmers Welfare, Government of India. 2019 -20.

In Table 1.5 we have shown the cropping pattern and production of different agriculture commodities in 2019 and 2020. We have given details about the area, production, and yields. The area has been shown in hec, production in tonnes, and yield in kg per hec. It is clear from the table that the total area in 2019 was 835 hec out of which 256.0 hec had been used for rice, 337.0 hec had been used for wheat, and 192.0 hec for cereals, and only 60.0 hec for pulses. If we see 2020 data the area has been decreased total area decreased to 805 hec from 835 hec in 2019, out of a total of 805 hec, 247 hec is used for rice production, 316 hec for wheat, 182 hac for cereal, and 60.0 checks for pulses. Except for pulses the area in the rest of the commodities has decreased by around 10%.

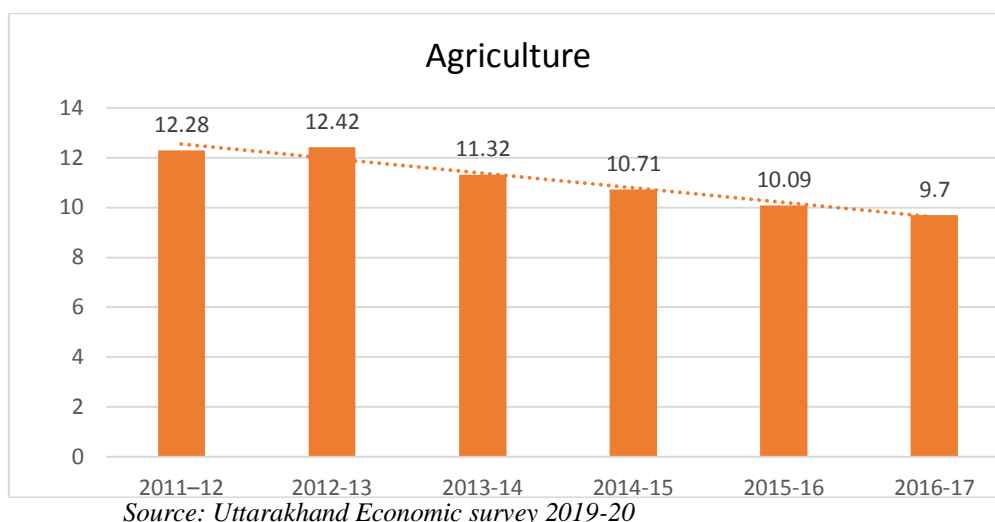
If we see the production in 2019 total production is 1873 tonnes out of which 617.6 tonnes are rice production, 951.6 tonnes are wheat, 251.7 tonnes are cereals and 52.1 are pulses. In 2020 total production is 1877.3 tonnes out of which 658.4 tonnes production was of rice, 904.1 tonnes of wheat, 265.8 tonnes of cereal, and only 49 tonnes production was of pulses. It is clear from the table that the pulses production has been decreased.

If we see the last column of yield (Kg.per.ha) in 2019 total yield was 7842 kg per ha out of which 2704 kg per ha yield was for rice, 2910 for wheat, 1306 for cereal, and 922 kg per ha for pulses. In 2020 total yield per ha has been little increased to 7864 per ha out of which 2705 kg per ha was for rice, 2861 kg per ha for wheat, 1335 kg per ha for cereal, and 963 kg per ha for pulses.

Changing patterns of Agriculture in Uttarakhand

Sectoral Shares (%) in Gross Value Added of Uttarakhand (at current prices)						
Sector	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Agriculture	12.28	12.42	11.32	10.71	10.09	9.70

Source: Uttarakhand Economic survey 2019-20

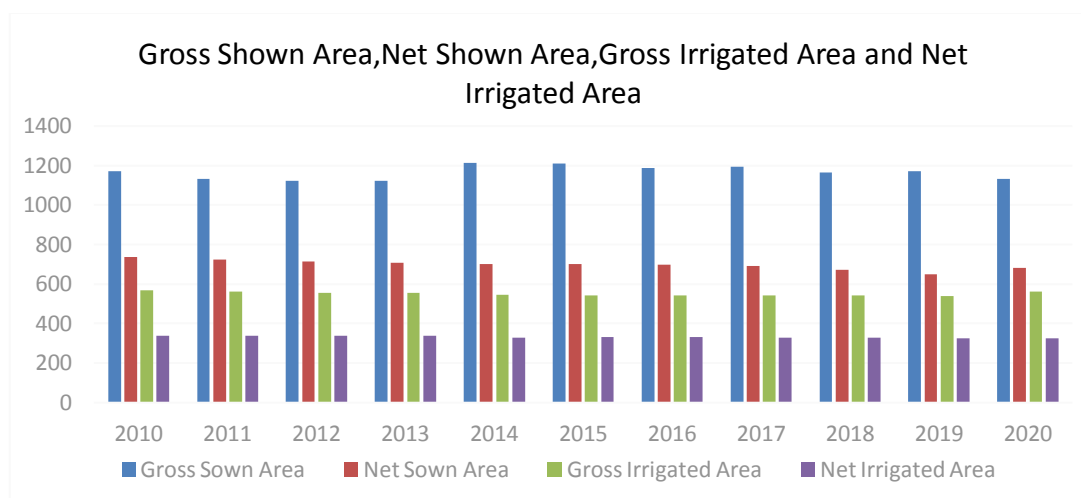


The Table: Shows the contribution of agriculture to Gross Value added in Uttarakhand state (at current Prices) From 2012-13 to 2015-16. In the above table, it is very clear that in 2011-12 the agriculture sector contributes 12.28 percent (GVA), In 2012 it was 12.42 percent, and in 2013 was 11.32 percent, in 2014-15 it contributes 10.71 percent, in 2015-16 10.09 percent, and 9.7 percent, in 2016-17. The data shows the decreasing trend of agriculture contribution in state gross value added in Uttarakhand.

Land-use Patterns

Year	Gross Sown Area	Net Sown Area	Gross Irrigated Area	Net Irrigated Area
2010	1170	737	567	338
2011	1132	723	562	336
2012	1124	714	555	339
2013	1124	706	554	338
2014	1212	701	544	328
2015	1210	700	542	330
2016	1187	698	541	330
2017	1193	691	542	329
2018	1166	673	543	329
2019	1170	648	540	323
2020	1132	680	561	326

Source: Ministry of Agriculture and Farmers Welfare, Government of India. 2010 -2020.



Source: Ministry of Agriculture and Farmers Welfare, Government of India.

In table 1.1 we have shown the Gross Sown Area, Net shown Area, Gross Irrigated Area, and Net Irrigated Area. The table clearly shows that the Gross sown area decreased from 1170 (Thousand Hectares) in

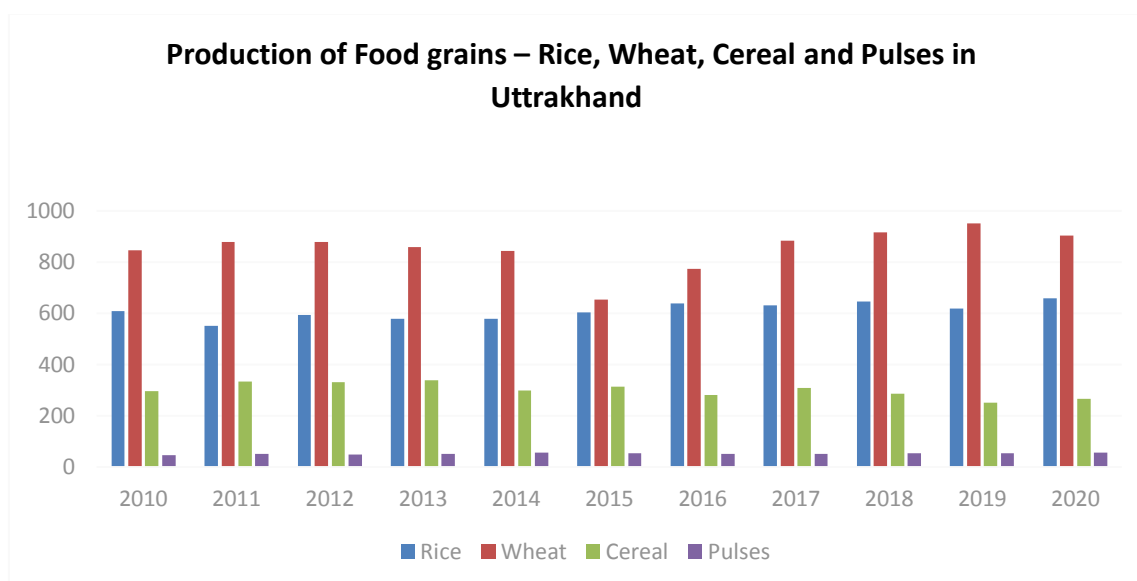
2010 to 1132 (Thousand Hectares) in 2020. 2014 data shows the Maximum Gross sown area while 2012-2013 shows the minimum Gross sown Area in the State. The Net sown area also decreased from 737 (Thousand Hectares) in 2010 to 680 (Thousand Hectares) in 2020. The gross irrigated area has decreased from 567 (Thousand Hectares) in 2010 to 561 (Thousand Hectares) in 2020 and the net irrigated area also decreased from 338 (Thousand Hectares) to 326 in 2020

Cropping Patterns

Table 1.2 Production of Food grains – Rice, Wheat, Cereal, and Pulses in Uttarakhand (Million tons)

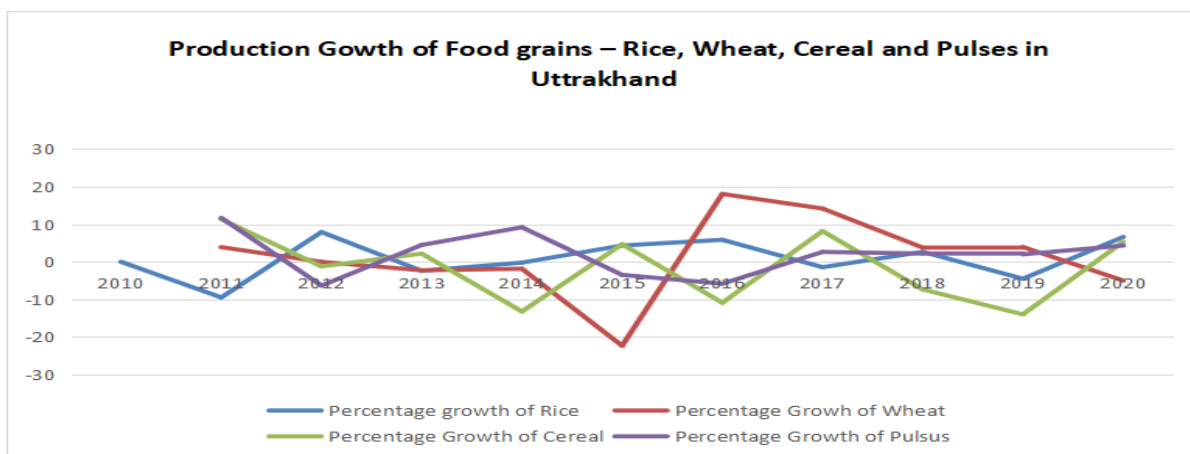
Year	Rice	Growth	Wheat	Growth	Cereal	Growth	Pulses	Growth
2010	608	--	845		297		46	
2011	550.4	-9.474	878	3.905	335	11.343	52.1	11.7083
2012	594	7.922	878	0.000	331	-1.208	49	-6.3265
2013	579.8	-2.391	858.2	-2.255	338.4	2.187	51.3	4.4834
2014	578.6	-0.207	842.4	-1.841	298.9	-13.215	56.5	9.2035
2015	603.7	4.338	654.2	-22.341	313.6	4.688	54.6	-3.4799
2016	639.1	5.864	772.4	18.068	282.8	-10.891	51.6	-5.8140
2017	630	-1.424	882	14.190	308	8.182	53	2.6415
2018	646.7	2.651	915.4	3.787	286.9	-7.354	54.2	2.2140
2019	617.6	-4.500	951.6	3.955	251.7	-13.985	55.3	1.9892
2020	658.4	6.606	904.1	-4.992	265.8	5.305	57.8	4.3253

Source: Ministry of Agriculture and Farmers Welfare, Government of India. 2010-2020
The growth rate is calculated by the authors



Source: Ministry of Agriculture and Farmers Welfare, Government of India. 2010-2020

In Table 1.2 We have shown the production of Food Grains Rice, Wheat, cereal, and Pulses from the Table it is clear that the production of Rice in 2010 was 608(Millington) and in 2020 it was 658.4(Millington) which shows the production of Rice has been increased. The production of Wheat increased from 845(Million tons) in 2010 to 904.1(Million tons) in 2020. The wheat has also shown positive growth. The table also shows that the production of Cereal has also increased from 297(Million ton) in 2010 to 265.8(Millington) in 2020 the pulses has also shown positive Growth which is increased from 46 (Millington) in 2010 to 57.8 (Millington) in 2020.

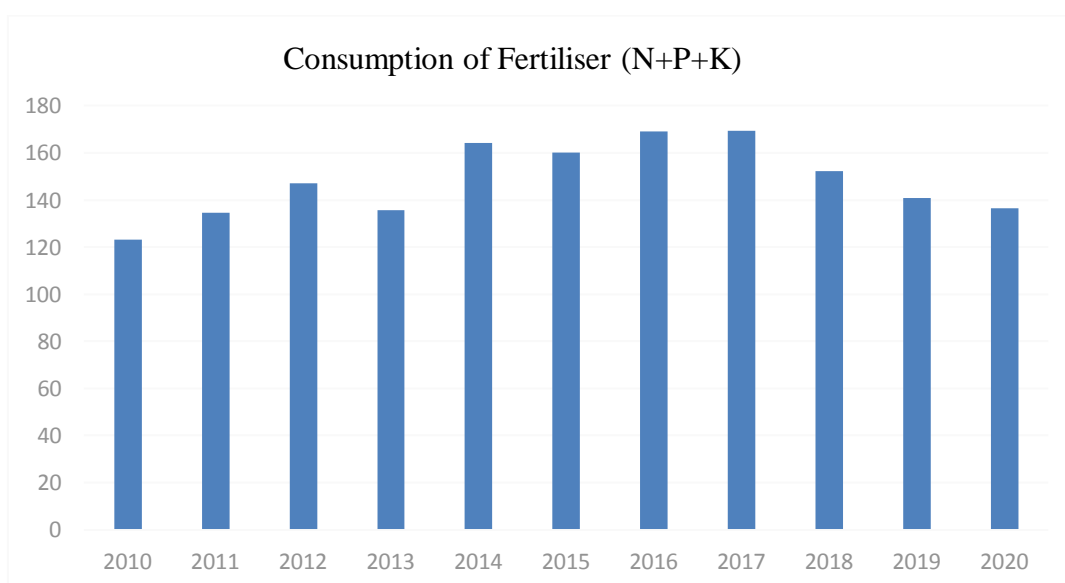


Source: Ministry of Agriculture and Farmers Welfare, Government of India.

Table 1.3 Fertilizer consumption Patterns Per Hectare Consumption of Fertiliser (N+P+K) (Kg. per Hectare)

Year	Consumption of Fertiliser (N+P+K)	% Growth
2010	123.2	-----
2011	134.5	9.172
2012	147	9.294
2013	135.7	-7.687
2014	164.1	20.929
2015	160	-2.498
2016	169.2	5.750
2017	169.3	0.059
2018	152.1	-10.159
2019	140.7	-7.495
2020	136.5	-2.985

Source: Ministry of Agriculture and Farmers Welfare, Government of India.
 The growth rate is calculated by the authors
 N= Nitrogen, P= Phosphorus, K= Potassium



Source: Ministry of Agriculture and Farmers Welfare, Government of India.

In Table 1.3 we have shown the per hectare Fertilizer consumption pattern of Nitrogen(N), Phosphorus(P), and Potassium(K) in kg per hectare. We can see from the table that from 2010 to 2020 there have been ups and downs in the consumption of fertilizers. As in 2010, it was 123.2 kg per hectare which increased in 2012 to 147 kg per hectare and again decreased in 2013 to 135.7 kg per hectare then rose to 164.1 kg per hectare in 2014. It is clear from the table that in 2016 and 2017 it was highest respectively 169.2 and 169.3 kg per hectare which fell further to 152.1 kg per hectare in 2018, 140.7kg per hectare in 2019 and 136.5 kg per hectare in 2020.

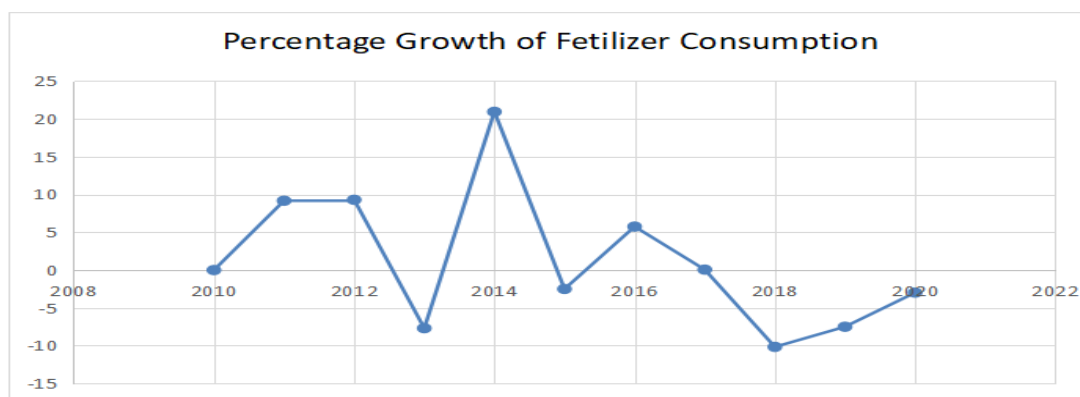
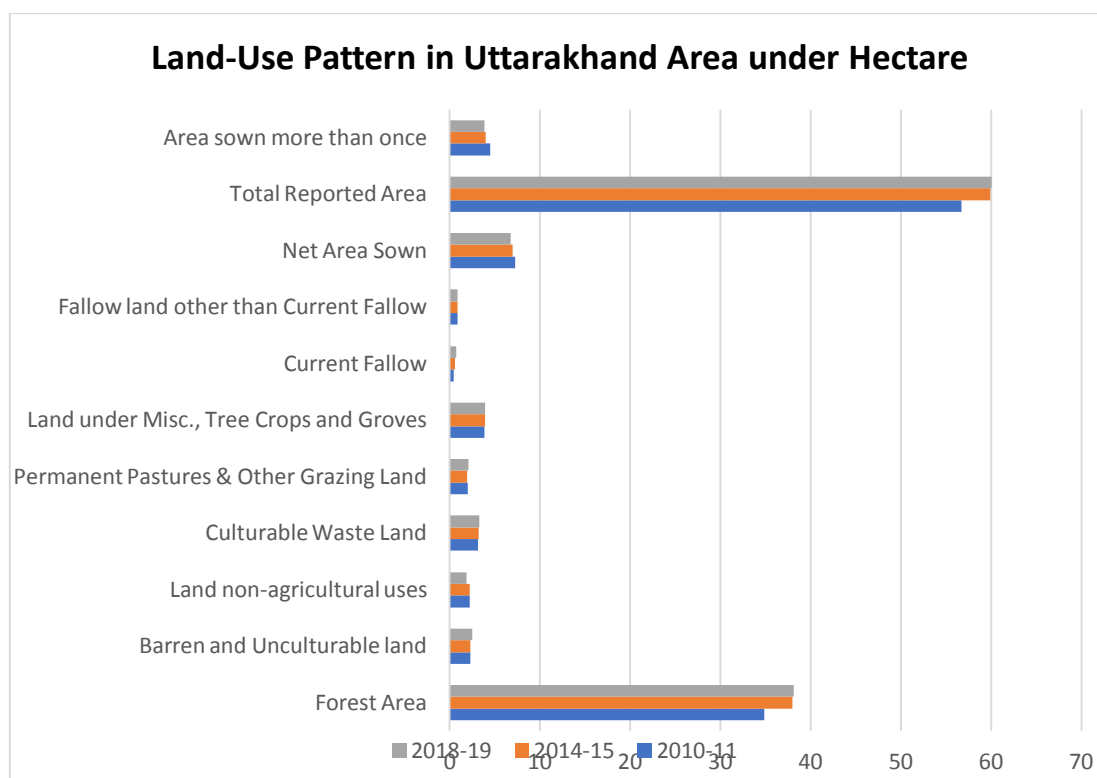


Table1.4

Classification of Total Geographical Area (in lakh. Hectares)			
Classification	2010-11	2014-15	2018-19
Forest Area	34.85	38	38.12
Barren and Unculturable land	2.25	2.28	2.49
Land non-agricultural uses	2.18	2.24	1.86
Culturable Waste Land	3.10	3.17	3.24
Permanent Pastures & Other Grazing Land	1.99	1.92	2.08
Land under Misc., Tree Crops and Groves	3.86	3.88	3.94
Current Fallow	0.43	0.57	0.73
Fallow land other than Current Fallow	0.84	0.86	0.86
Net Area Sown	7.23	7	6.72
Total Reported Area	56.73	59.93	60.04
Area sown more than once	4.47	3.97	3.87

Source: Uttarakhand Economic survey 2019-20



Source: Uttarakhand Economic survey 2019-20

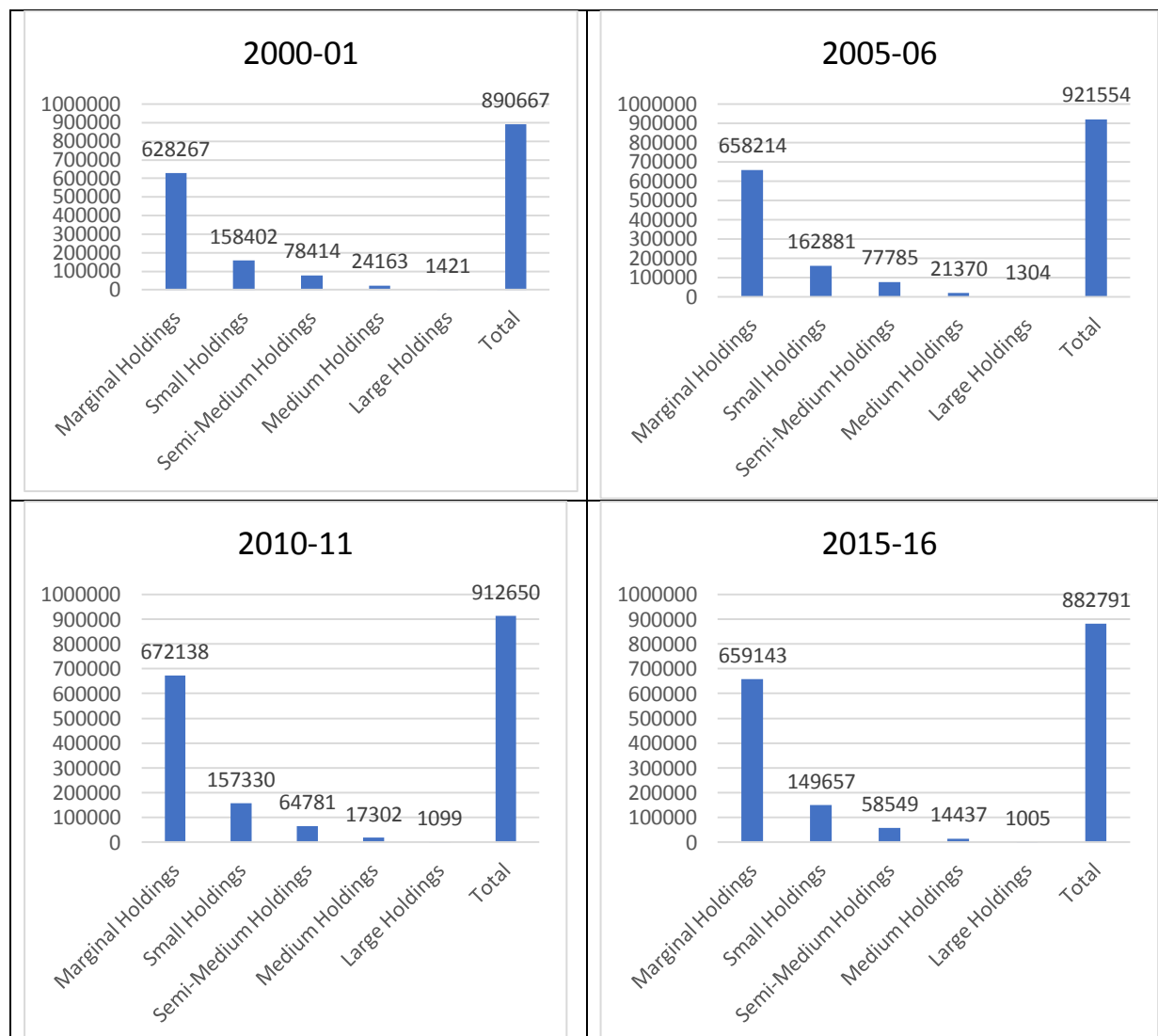
In Table 1.4 We have shown the land use pattern in the Uttarakhand area under a hectare. We can see from the table that the area under forest in 2010-11 is 34.85 (hectares) which changed to 38.12 (hectares) in 2018-19, the area under barren and unculturable land is 2.25 (Hectares) in 2010-11 which changed to 38.12 (Hectare) in 2018-19. The current fallow also increased from 0.43 (Hectare) in 2010-11 to 0.73 (Hectare) in 2018-19. The land under non-agriculture uses also decreased from 2.18(Hectare) in 2010-11 to 1.86(Hectare) in 2018-19. From all the above information, we observed overall changes in land-use patterns from 2010-11 to 2018-19 in Uttarakhand state.

Number of operational Holdings in different categories in Uttarakhand

Categories	2000-01	2005-06	2010-11	2015-16
Marginal Holdings (Below 1.0 ha)	628267	658214	672138	659143
Small Holdings (1.0 – 2.0 ha.)	158402	162881	157330	149657
Semi-Medium Holdings (2.0 – 4.0 ha.)	78414	77785	64781	58549
Medium Holdings (4.0 – 10.0 ha.)	24163	21370	17302	14437
Large Holdings (10.0 ha. & above)	1421	1304	1099	1005
Total	890667	921554	912650	882791

Source: Agriculture Census in Uttarakhand 2010-11

Distribution of the Number of operational Holdings in different categories in Uttarakhand From 2000- 01 to 2015-16.



Source: Agriculture Census in Uttarakhand 2010-11

In table 1.6 we have shown the distribution of the number of operational holdings in different categories in Uttarakhand. It is clear from the table that in 2000-01 marginal holdings (Below 1.0 ha) were 628267 in 2005-06 they were 658214 in 2010-11 they were 672138 and in 2015-16 they were 659143. Small holdings (1.0-2.0 ha) were 158402 in 2000-01, 162881 in 2005-06, 157330 in 2010-11 and 149657 in 2015-16. Semi medium holdings (4.0-10.0ha) were 78414 in 2000-01, 77785 in 2005-06, 64781 in 2010-2011 and 58549 in 2015-16. Medium holdings (4.0-10.0 ha) were 24163 in 2000-01, 21370 in 2005-06, 17302 in 2010-11 and 14437 in 2015-16. Large holdings (10.0 hac & above) were 1421 in 2000-01, 1304 in 2005-06, 1099 in 2010-11 and 1005 in 2015-16. It is clear from the table that all other holdings have fallen except for Marginal holdings, which is not a good sign for agriculture.

III. Conclusion

From the above discussion, it is concluded that there are various limitations in the agricultural sector of Uttarakhand state. It is due to its geographics, limited irrigation, marketing, and transportation problem. Looking at the present situation in Uttarakhand the figures in terms of production, area, and yield rate are not satisfactory. The share of the agriculture sector is decreasing continuously from 2011-12 to 2016-17. The Growth in the production of major crops is not constant. the consumption of fertilizer increased from 2010-to 2017 after that started decreasing. the total distribution of the number of holding of different categories increased from 890667 in 2000-01 to 91554 in 2005-06. and then decrease from 912650 in 2010-11 to 882791 in 2015-16. Even though the green revolution in 1967-68 has led to a bumper harvest of major crops especially rice and wheat which in turn has contributed to a large extent in uplifting the rural population, the late figures are very disturbing and the trends have started emerging in the said sector as the farmers are losing interest subject to less remunerative. To

sustain continuous growth in productivity in agriculture, profitability and sustainability are a must. There is a need to create a general awareness about the knowledge, skill, and techniques to enhance the production, productivity, and quality of food grains so that the farmers could earn a sustainable income for survival.

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