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Shifting of Agriculture to Horticulture in Anantnag District: A Geographical Analysis

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ABSTRACT

The vast area of paddy crop in Anantnag district (Jammu and Kashmir) has been converted for the construction of houses, roads and especially for horticultural purposes. The cultivation of paddy has been an old cultural heritage of Anantnag district as well as for the Kashmir valley as a whole, while the farmers are increasingly finding it less profitable in recent times. The present study used both primary (Survey) and secondary data from different sources with an aim to highlight the issue of diversifying of food crops (Paddy) towards cash crops (Apple) in district Anantnag. The findings from the study reveal that 6908 hectares of agricultural cropped area is shifted towards the horticultural cropped area, as agricultural crops (paddy) have low comparative advantage over horticultural (Apple). Paddy land under surveyed farmers has registered a significant decrease from 330 canals (83.75%) in 2000-01 to 158 canals (40.11%) in 2014-15, therefore showing an absolute change of -172 canals. The primary survey further reveals that 09 (30%) of the respondents says less profit is the main reason behind the shift, followed by irrigation (drought) problems 07 (23.34%) and 14 (46.66%) respondents says both reasons are responsible behind shift of Paddy to Apple cultivation in the region.

Keywords:
Agriculture; Apple; Diversification; Horticulture; Paddy

1. Introduction

Land is one of the most important aspects of life. In farming, the role of land, as the main input is priceless. Economically, land is most effective wealth-producing asset for Indian farmers and is vital factor for economic growth. During the last three decades, India has made dramatic strides on the agricultural front. India has high population pressure on agricultural land and other resources to fulfill food and developmental needs. The natural resource means of land, water and bio-diversity is under wicked pressure. Shrinking land for agriculture and ever-increasing demand for food are due to population increase and crop diversification. The farmer's interest in traditional agriculture has been declining day by day in India as well as low productivity are the main reason behind the conversion of land towards the horticulture in Anantnag district of Jammu and Kashmir (Apple) (Mir, 2014).

Crop diversification has taken place in the state of Jammu and Kashmir as a result of different land reforms implemented by the Indian government from time to time. Crop diversification is influenced by factors such as technology, modern implements, education, bank finance, and road connectivity (Kumar et al., 2012). Diversification is an important strategy for increasing agricultural revenue, alleviating poverty, creating jobs, preserving the environment, promoting exports, and reducing risks (Ryan and Spencer, 2011; Bazaz & Haq, 2013). Diversification to cash crops has the potential to transform the agricultural system by increasing income, creating jobs, and promoting exports. In India, agricultural diversification is gradually shifting in favor of high-value food commodities, mostly to increase revenue rather than the conventional risk management notion (Joshi, 2004).

Jammu and Kashmir's economy is mostly based on agriculture, with around one-third of the population engaged in agriculture and allied sectors (Shah et al., 2016). The geography of the area limits the expansion of paddy agriculture. Horticulture is a viable alternative for exploration against a backdrop of stagnant paddy production because paddy production is not expanding in proportion to the cost of farming, which is unable to enhance the level of employment in the region (Economic survey, 2014 & 2015). Because of its topography, temperature, and a vast range of agro-climatic niches, Jammu and Kashmir has significant potential for horticulture growth (Bhat, 2013; Majid, 2012; Raina, 2000; Swarup and Sikka, 1987). Especially in Kashmir valley the diversity in the climatic zone makes it suitable for growing a variety of fruits. These fruits appear to be the principal item of export to other regions of India and the rest of the world, as well as a supplement to the local people's diet. Apple growing is a centuries-old occupation in Jammu and Kashmir, with about 200 varieties of apple planted in the state. The Kashmir apple has lived up to its reputation as one of India's most desirable fruits (Masoodi, 2003). The apple crop, which involves around half a million homes, dominates the horticultural industry and plays a significant role in the state's economic situation (Malik & Choure, 2014; Bhat et al., 2019). A significant increase in an area under apple cultivation have been observed by Ahmed (2013) is largely due to the higher economic returns. Because of the great quality of the fruit, apple growing is a highly valuable economic activity in the state. It is a labor-intensive and commercially appealing farm-based economic activity. If done in a methodical manner, the income per acre is substantially higher than any other horticulture crop (Bhat et al., 2019). There are various factors which hinder the overall productivity of the apple cultivation in the area, particularly because of the problems like marketing, good quality pesticides, storage facilities and irrigation etc. It has been claimed that removing these roadblocks could boost production, similar to what has been achieved in China and other European countries (Bhat and Choure, 2014).

Agriculture occupies an important place in the economy of the Anantnag district. The importance of agriculture in the district economy can be gauged from the fact that during the year 2016-2017, 64.56% of the reporting area was under agricultural activities in one way or other. By maintaining soil fertility of agricultural land, increases production. The soil fertility should be improved and maintained by applying fertilizers like chemical, organic, bio-fertilizers etc., as well as by crop rotation. Efforts should be made that no cultivable and arable land is left un-ploughed and as well as uncultivable. The farmers should defy every move to convert the agricultural land to non-agricultural uses, especially for horticultural proposes (apple). The farmers of Anantnag district should practice horticulture on other uncultivable land and fallow lands, as Anantnag district already facing a shortage of

food grains. Thus, districts import large quantities of food grains (rice) from other states to feed a growing population. The agriculture department must establish seed banks of paddy and provide better varieties to farmers that will double the production, thus minimize the input ratio and maximize the output ratio. Agriculture is largely dependent on adequate irrigation facilities. The district had in abundant water resources both surface and groundwater. The surface water is in the form of streams, rivulets and well as in form of canals. The famous canal in the Anantnag district is Martand Canal famously known as Shah-Kul. Most of the area under Karewas (both agriculture and horticulture) in the Anantnag district is directly dependent on this canal for irrigation purposes as well for using during spraying pesticides in apple orchards. The villages of Anantnag district that are dependent on this canal in one way or other are Margay Pora, Kadapora, Kaganhall, Gopal-pora, Khribal, Tailwani, Tumburpora, Rampora, Mattan, Seer Hamdand etc.

The district is also bestowed by the mighty Jehlum river, as its origin is Verinag located at foothills of the Pir-Parchal range. But the scenario has changed as water resources in the Anantnag district for last 2 decades shrinking leads to drought problems for agricultural land. Most of the farmers are forced by drought-related problems to shift from food crops (paddy) towards apple cultivation. Agriculture is contingent upon irrigation facilities. To increase as well as maintain the arable area irrigation Schemes, Minor and Major should be implemented in the studied district. Keeping in view the rapid shifting of Agricultural to horticulture, the present research was conducted to achieve the following objectives, viz: 1) To study the shift from paddy crop towards apple cultivation in the Anantnag district among surveyed farmers; 2) To study the reasons behind shift among surveyed farmers in Anantnag district; 3) To examine the effects of shift from traditional paddy cultivation towards apple cultivation; 4) To suggest better policy implications in the field of agriculture to control shift of paddy fields towards non-agricultural purposes, especially horticulture.

2. Materials and Methods

2.1 Study area

Anantnag district is located in the southern part of the Kashmir valley. It is one of the 20 districts which make up the Union Territory of Jammu and Kashmir. It is held between geographical coordinates of 74°-30' to 75°-35' East longitude and 33°-20' to 34°-15' North latitude (Figure 1). The elevation of the region varies between 1,586 m asl to 5,236 m asl located at a distance of 33Kms from Srinagar city. The southern part of the study region is bordered by the tehsils of Reasi, Banihal and Kishtwar of Jammu province, on the eastern side by Kargil tehsil of Ladakh division and on the northern and western parts by Pulwama and Kulgam districts. The study area has a total population of 1,078,692 and a total area of about 257,724.2 hectares. It is the third most populous district of Jammu and Kashmir after Jammu and Srinagar. There are three meteorological stations located in the study area namely Pahalgam, Qazigund and Kokernag (Ahmed et al., 2021b).

Anantnag district is well known in the Horticulture sector in south Kashmir. The favorable agro-climatic condition for growing of fresh fruits of various verities namely apple, pear, apricot, peach, plum, and cherry, and dry fruits like walnuts and almonds. The horticulture sector is growing rapidly from last two decades replacing traditional field crops (paddy). One of the major benefits of horticulture is that

providing employment not only to the growers but also to wooden and cardboard boxes manufacturer, transporters, fertilizers and pesticides supplier, crop harvester (apple picking expert), commission agents, grader, pruner, porter and many other experts. Instead of the various benefits to other people, still farmers in the Anantnag district practise horticulture due to its profitability than agriculture (paddy). Thus, orchards are being grown on the prime paddy land in addition to fallow, current fallow and karewa lands.

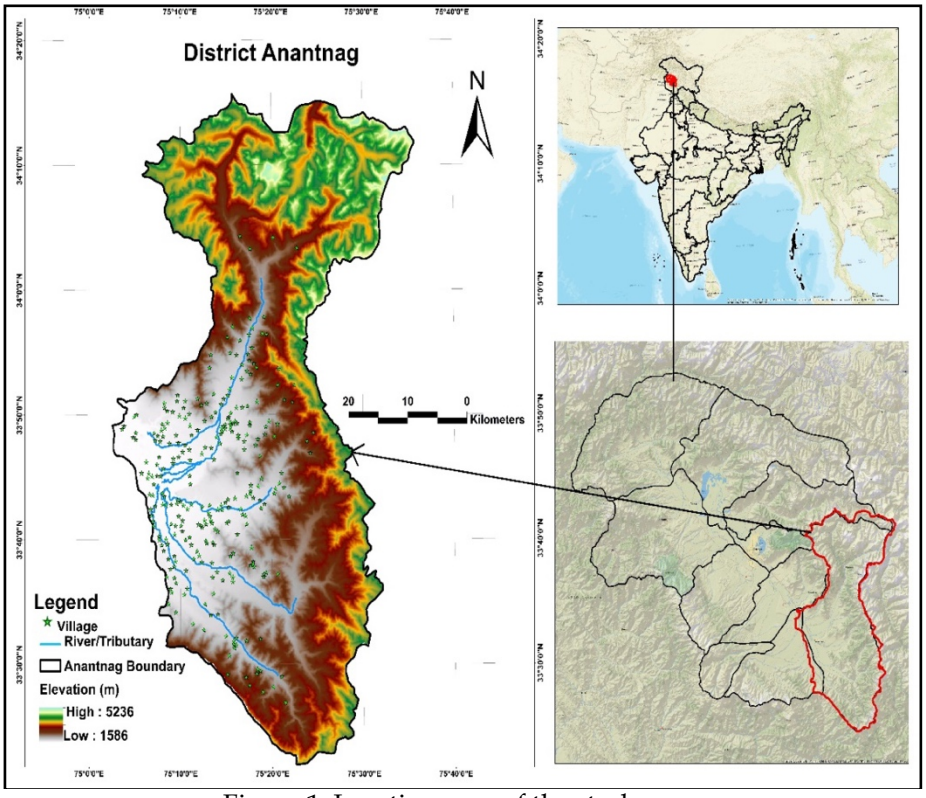

Figure 1. Location map of the study area

2.2 Data Base and Methodology

For achieving the said objectives the present study consolidates information from different sources ranging from primary to secondary data. Primary Data is the data has been collected through field survey by means of Schedule, in which face-to-face interaction was made with farmers. Whereas, Secondary Data is the data that has been collected from various departments such as District Statistical Hand Book of Anantnag district; Report of Chief Agricultural office Anantnag district; Report of Chief Horticulture office Anantnag district of the year 2000-2001 to 2014-2015.

2.3 Universe of Study, Sample Unit Sample Size

The universe of the study is at Anantnag district. The primary data has been collected from farmers through the schedule, so the unit of study is a farmer. The sample of 30 farmers from 5 villages of Anantnag district has been taken through the Convenience sampling technique. The location of sample sites, taken during the survey from five villages is reflected in Figure 2.

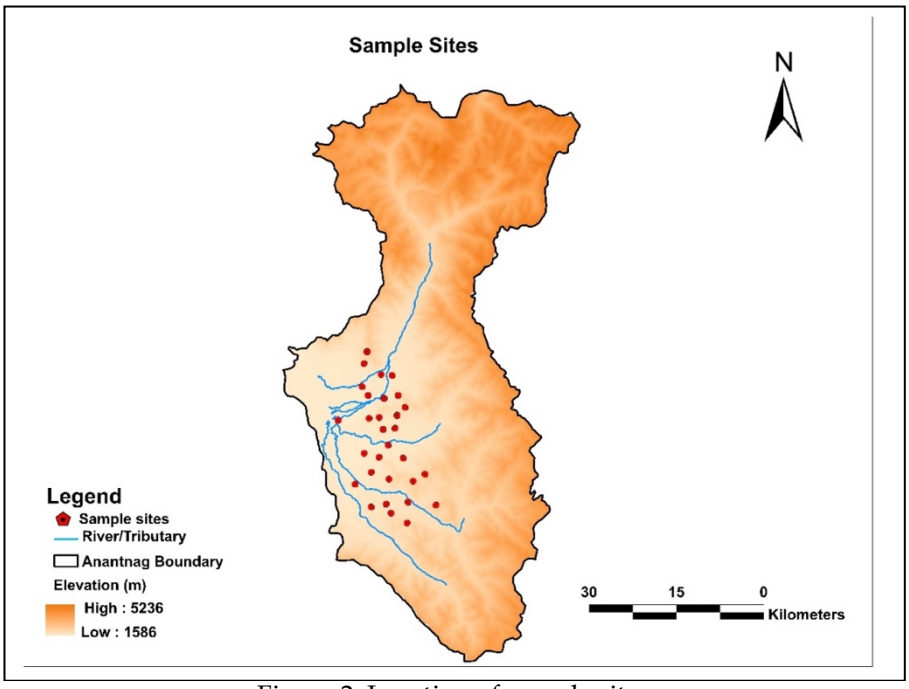

Figure 2. Location of sample sites

2.4 Relevance of Study

The development of a nation largely depends on the development of agriculture, as more than 60% of the population is largely dependent on agriculture in some way or another way. The relevance of the research paper aims to analyze the shift from paddy to apple cultivation. By this shift, not only the district but the whole of Kashmir valley faces a deficiency of food crops and will depend on other states for food crops. The deficiency of food crops is due to shift by farmers towards apple cultivation. This diversifying of crops leads to high price of food crops, which is a concern for the government as well as for poor people in the district. This research study will be very fruitful for district-level administration for regional planning and needs to put forward proper steps that should control the conversion of paddy land for non-agricultural purposes, especially for apple cultivation.

3. Results and Discussion

3.1 Analysis of shifting Agriculture to Horticulture in the Anantnag district

Agriculture being an essential occupation of the Kashmir valley contributes 20 % of the states GDP. Paddy is an important agricultural crop of the valley. The Paddy crop is a stable food crop of Kashmir but is not self-sufficient in its production. Thus, the state has to import a large quantity of paddy (rice) from other states for domestic consumption. The vast area of paddy fields in the Anantnag district has been converted for horticultural and commercial purposes. There is a need to take in humanistic approach towards farmers engaged in paddy cultivation, who labor hard in their fields but gains less profit. Table 1 gives the details of the shrinking paddy fields of the Anantnag district.

Table 1. Shift between Agricultural and Horticultural crops (2008-2009 to 2012-2013)

Name of Extension	Deviation
Agricultural crops	-6908.0
Horticultural crops	+6194.7

Source: Compiled from district Hand Book of Anantnag

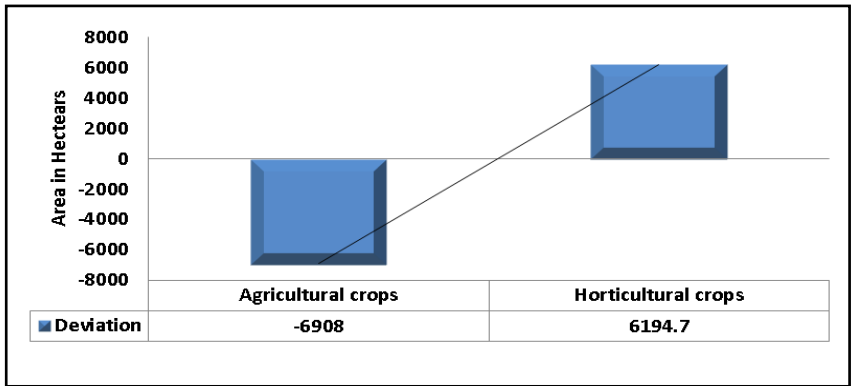

Figure 3. Shift between Agricultural and Horticultural crops

The total deviation in area among agricultural crops was -6,908 ha, while as the deviation in area among horticultural fruits was 6,194.7 hectares. Thus, it is examined those 6,908 hectares of agricultural cropped area was shifted towards the horticultural cropped area from 2008-2009 to 2012-2013 (Figure 3). One of the major reasons behind this is that a local farmer said "Amiseth Chuni Aasi Sirf Yeed Hund Guzari Gachan" which means that by the cultivation of paddy we just fetch our bellies only. The comparative advantage of paddy is low as compared to horticulture crops.

3.2 Size of Land Holdings of Surveyed Farmers

Table 2 describes size of holdings, the area operated, and number of respondents among surveyed farmers from 2000-2001 to 2014-2015.

Table 2. Size of land holdings among surveyed farmers

Size of Holdings (acres)	No. of Respondents	Percentage	Area Operated (acres)	Percentage
0-2	23	76.66	26.0	53.06
2-4	06	20.00	18.5	37.75
4-6	01	03.34	04.5	9.18
Above 6	0	0	0	0

Source: Compiled from Field Survey

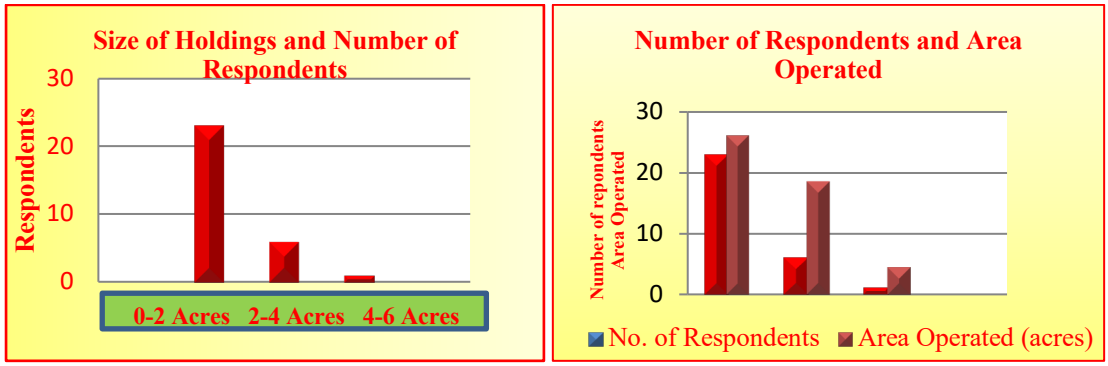

Figure 4. Size of holdings and number of respondents (a) and number of respondents and area operated (b).

It is observed from the study that 23 respondents have 0-2 acres of land holdings, followed by 06 respondents have 2-4 acres of land holdings, 01 respondents have 4-6 acres of land holdings, while as none of the respondents have more than 6 acres of land. It is observed that 2/3rd of the respondents belong to a marginal category, 1/5th belong to the small category, 1/20th of respondents belong to the medium category and none of the respondents belong to a large category. It is also observed that 23 (76.66%) of respondents operated 26 acres (53.06%) of land holdings, followed by 06 respondents (20%) operated 18.5 acres (37.75%) of land holdings, 01 respondent operated 4.5 acres (9.18%) of land holdings (Figure 4a, b).

3.3 Area under Paddy and Apple of Surveyed Farmers

The total area, area under paddy and area under apple cultivation of surveyed farmers (respondents) in the year 2000-2001 and 2014-2015 is given below in Table 3.

Table 3. Total area under paddy and area under apple cultivation in surveyed farmers

Year	Total Area (Canals)	Area under Paddy	Percentage	Area under Apple	Percentage
2000-2001	394	330	83.75	64	16.25
2014-2015	394	158	40.11	236	59.89

Source: Compiled from Primary Data

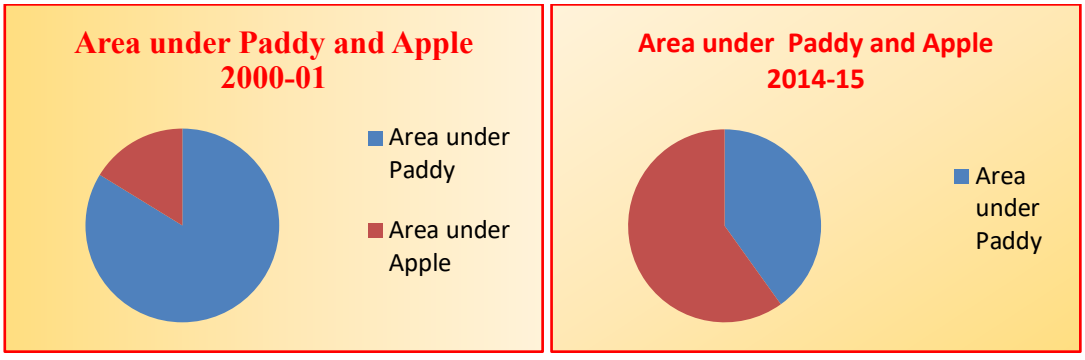

Figure 5. Area under Paddy and Apple in 2000-2001 (a) and Area under Paddy and Apple in 2014-2015 (b).

It is revealed that the total area under surveyed farmers was 394 Canals, out of total area 330 (83.75%) Canals were under Paddy and area under Apple was 64 Canals (16.25%) in the year 2001-01. While as the scenario has changed as paddy area is shrinking day by day in Anantnag district. The area under Paddy is 158 Canals (40.11%) and the area under apple is 236 Canals (59.89%) of surveyed farmers in the year 2014-15 (Figure 5a, b). Thus, paddy fields are shrinking for the last decade due to less interest from farmers, less profit and other reasons leading to a shift in paddy towards apple cultivation. The farmers of Anantnag district should practice horticulture on other uncultivable land and fallow lands, as Anantnag district already facing a shortage of food grains. Thus, districts import large quantities of food grains (rice) from other states to feed a growing population.

3.4 Change in the area under Paddy and Apple of Surveyed Farmers

The change in area under Paddy and Apple of surveyed farmers from 2000-2001 to 2014-2015 is given below in Table 4 as:

Table 4. The change in area under Paddy and Apple of surveyed farmers from 2000-2001 to 2014-2015

Area under crops	2000-2001		2014-2015		2000-2001 to 2014-2015 Change in Area		
	Area (Canals)	%	Area (Canals)	%	Absolute change (Canals)	% Change	Growth percentage
Paddy	330	83.75	158	40.11	-172	-43.64	-52.13
Apple	64	16.25	236	59.89	172	43.64	37.21
Total	394	100	394	100			

Source: Compiled from Primary Data

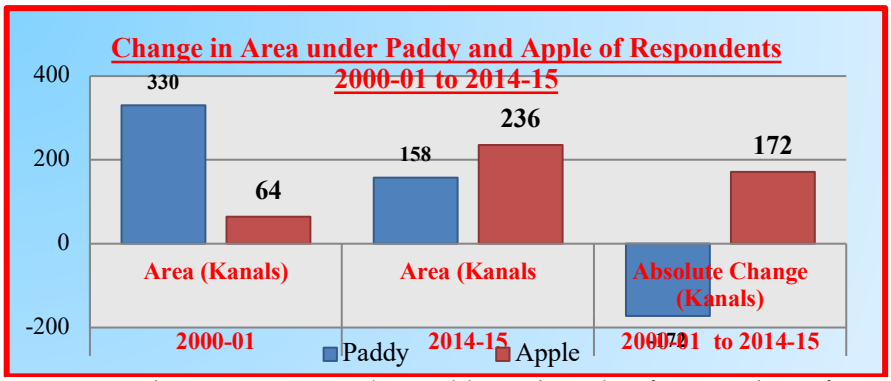

Figure 6. Change in area under paddy and apple of respondents from 2000-01 to 2014-2015

The study reveals that the paddy has registered a significant decrease from 330 canals (83.75%) in 2000-2001 to 158 canals (40.11%) in 2014-2015, therefore showing an absolute change of -172 canals. On the other hand, area under apple registered a significant increase from 64 canals (16.25%) in 2000-2001 to 236 canals (59.89%) in 2014-2015, thus registering an absolute change of 172 canals (Table 4, Figure 6). Anantnag district is well known in the Horticulture sector in south Kashmir. The horticulture sector is growing rapidly from last two decades replacing traditional field crops (paddy). One of the major benefits of horticulture is that providing employment

not only to the growers but also to wooden and cardboard boxes manufacturer, transporters, fertilizers and pesticides supplier, crop harvester (apple picking expert), commission agents, grader, pruner, porter and many other experts. Instead of the various benefits to other people, still farmers in Anantnag district practise horticulture due to its profitability than agriculture (paddy). Thus, orchards are being grown on the prime paddy land in addition to fallow, current fallow and karewa lands (Figure 7).

Figure 7. Photographs taken during the field survey showing paddy fields converted into apple-cultivated land

3.5 Reasons behind Shift

The reasons behind shift of paddy towards apple cultivation among surveyed farmers from 2000-2001 to 2014-2015 as follows.

Table 5. The reasons behind shift of paddy towards apple cultivation among surveyed farmers from 2000-2001 to 2014-2015

Reason Behind Shift	No. of Respondents	Percentage
Less profit	09	30.00%
Irrigation problem	07	23.34%
Both	14	46.66%
Total	30	100%

Source: Compiled from Primary data

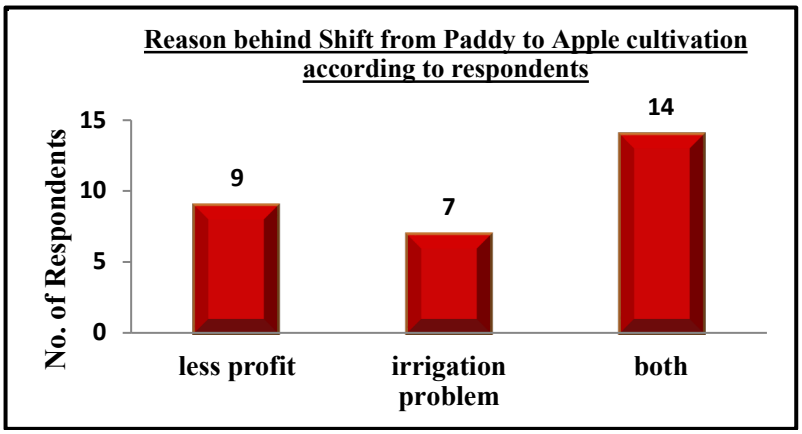

Figure 8. Reasons of a shift from paddy to apple cultivation

It is revealed from the primary survey that 09 (30%) respondents say less profit is the main reason behind shift, followed by 07 (23.34%) say irrigation (drought) problems and 14 (46.66%) respondents say both reasons are behind shift. (Table 5, Figure 8).
The cultivation of apples in district Anantnag has shown a discernible increase both in terms of areal expansion and production from the past few decades. However, the findings from the present study reveal that the conversion of agricultural land into horticulture (Apple) has taken a great pace, especially during the period from 2010-2020. The people in the region have shifted from agriculture to horticulture mainly because of the good economic returns. Besides economic compulsions, climate change and population growth are the other major reasons of the shift from agriculture to horticulture in the valley of Kashmir including Anantnag district as confirmed by (Fayaz et al., 2021; Ahmed et al., 2021).

4. Conclusion

The major findings drawn from this study was that there was major Agricultural cropped area (6,908 ha) have shifted towards the horticultural crops since agricultural crops (paddy) have a low comparative advantage over horticultural (Apple). Paddy area is shrinking day by day in Anantnag district from 83.75% to 40.11% and the area under apple is increasing from 16.25% to 59.89%of surveyed farmers in the year 2014-2015. Primary survey showed about 30%respondents said less profit is the main reason behind the shift, followed by 23.34% assumed irrigation (drought) problems and 46.66% respondents thought both reasons are behind shift.

The district administration in the field of agriculture shoot control shift of paddy fields towards non-agricultural purposes especially horticulture such as, the Government should provide high quality varieties of paddy like Muskibudji, as it has high market value; Formulate and implement agricultural acts to control various agricultural problems like land conversion, housing on paddy fields etc.; Formulate plans, policies and schemes for housing that will restrict the residents to construct houses on agricultural land.

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