



## SOWING THE SEEDS OF CHANGE: SHIFTING FROM TRADITIONAL CROPPING TO CASH CROPPING-SOME ILLUSTRATIONS FROM WESTERN HIMALAYAS

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### Abstract

Around 10,000 years ago human being had started domestication of plants and animals, even before this period, people had been altering plants and animal for their own benefit by using other means such as fire-stick farming. Moving from this time, agriculture has undergone drastic change because of technological development. With the changes in almost every sphere of life, agriculture has also undergone change particularly in developed and developing world, and has been characterized by enhanced productivity, the replacement of human labour to mechanization and the introduction of synthetic fertilizers and pesticides, selective breeding has changed the fate of agriculture round the globe and Himalayan states are not exception. Present paper is based on primary study conducted in Chamba and Kangra districts of Himachal Pradesh. In the state agriculture contributes nearly 45% to the net state domestic product and about 93% of the state population depends directly or indirectly upon agriculture, moreover it is main source of income as well as employment. Two districts have been selected for the study because of the fact that all these districts have four agro-climatic zones and it makes 'mini Himachal'. In these zones both types of cropping patterns i.e. rabi and kharif are being used since ages. But in present time, the seeds of change has sown and now the change is visible and people of the hilly region are changing traditional crops and shifting to cash crops. The paper is an attempt to analyse the shift from traditional crops to cash crops which is based on primary data based research collected from two study districts from the state of Himachal Pradesh in India dividing two districts in four sub-districts and further in 30 panchayats (lowest administrative unit) and 73 villages and atleast selecting three respondents from each village, 200 respondents have been interviewed to arrive at desirable results. The study has been conducted by using exploratory, descriptive and observation methods of research. The results from the study reveals that agriculturalists having more than 5 acres of land have changed land-use pattern while farmers having less than 5 acres land are compelled to do traditional cropping as it is compulsory to meet out their family needs. People have shifted from traditional crops to vegetables, sericulture and horticulture and earning very good income and experienced change in the amenities available in the household as well as they are capable to provide better living conditions.

**Keywords:** Traditional Agricultural Practices, Mobility, Agro-climatic Zones, Himachal Pradesh



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Agriculture refers to farming or husbandry in form of the cultivation of animals, plants, fungi and other forms of food, fibre and biofuel and other products used to sustain human life. Agriculture was the key development in the rise of sedentary human civilization,

whereby farming of domesticated species created food surpluses that nurtured the development of civilization. B. Holldobler & E.O. Wilson (1990<sup>1</sup>) in their analysis explained that agriculture generally refers to human activities, although it is also observed in certain species of ant and termite. The word *agriculture* is the English adaptation of Latin *agricultūra*, from *ager*, "a field",<sup>2</sup> and *cultūra*, "cultivation" in the strict sense of "tillage of the soil"<sup>3</sup> literally means "tillage of fields".

Agricultural development is being driven and defined by different climates, cultures, and technologies. However, all farming generally relies on techniques to expand and maintain the lands that are suitable for raising domesticated species. For plants, this usually requires some form of irrigation. In the developed world, industrial agriculture based on large-scale monoculture has become the dominant system of modern farming, although there is growing support for sustainable agriculture.

Until the *Industrial Revolution*, the vast majority of the human population laboured in agriculture. Pre-industrial agriculture was typically subsistence agriculture in which farmers raised most of their crops for their own consumption instead of for trade. A remarkable shift in agricultural practices has occurred over the past century in response to new technologies, and the development of world markets. This also led to technological improvements in agricultural techniques, such as the Haber-Bosch method for synthesizing ammonium nitrate which made the traditional practice of recycling nutrients with crop rotation and animal manure less necessary.

Modern agronomy, plant breeding, and agro-chemicals such as pesticides and fertilizers, and technological improvements have sharply increased the yield, but at the same time have caused widespread ecological damage and negative human health effects.<sup>4</sup> The major agricultural products can be broadly grouped into foods, fibres, fuels, and raw materials. In the 21st century, plants have been used to grow bio-fuels, bio-pharmaceuticals, bio-plastics, and pharmaceuticals.<sup>5</sup> Specific *foods* include cereals, vegetables, fruits, and meat. *Fibers* include cotton, wool, hemp, silk and flax. *Raw materials* include lumber and bamboo. *Biofuels* include methane from biomass, ethanol, and biodiesel. Cut flowers, nursery plants, tropical fish and birds for the pet trade are some of the ornamental products. Regarding food production, the World Bank targets agricultural food production and water management as an increasingly global issue that is fostering an important and growing debate.<sup>6</sup>

In 2007, one third of the world's workers were employed in agriculture. The services sector has overtaken agriculture as the economic sector employing the most people worldwide<sup>7</sup>.

Despite the size of its workforce, agricultural production accounts for less than five percent of the gross world product. All civilizations have depended on agriculture for subsistence. Growing food

On farms results in a surplus of food, particularly when people use intensive agricultural techniques such as irrigation and crop rotation.

**Agriculture: A Historical Perspective:** Scholars have proposed a number of theories to explain the historical development of farming. Early forms of farming are called *proto-farming*. The transition from hunter-gatherer to agricultural societies, based on evidence from South West Asia and China indicates an antecedent period of intensification and increasing sedentism (*transition from nomadic lifestyle to a society which remains in one place permanently*), known as the Natufian in south West Asia and the Early Chinese Neolithic in China. Evidence is also now emerging that the crops grown initially were wild and not domesticated.<sup>8</sup> Crops such as *emmer* and *einkorn* wheat do not appear to have become domesticated until well into the Neolithic and '*ancient cultivated rice*' (*Oryzasativa*) took 3000 years to become domesticated. Localised climate change is the favoured explanation for the origins of agriculture in the Levant *crossroads of western Asia, the eastern Mediterranean and northeast Africa" and consisting of countries like; today's Lebanon, Syria, Jordan, Israel, Palestine, Cyprus and parts of southern Turkey, Iraq and the Sinai Peninsula.*<sup>9</sup>), the fact that farming was 'invented'<sup>9</sup> at least three times elsewhere, suggests that social reasons may have been instrumental. When major climate change took place after the last ice age (c. 11,000 BC), much of the earth became subject to long dry seasons. These conditions favoured annual plants which die off in the long dry season, leaving a dormant seed or tuber.

The **Oasis Theory** was proposed by Raphael Pumpelly in 1908, and popularized by Vere Gordon Childe who summarized the theory in his book *Man Makes Himself*<sup>10</sup> stressed that as the climate got drier, communities contracted to oases where they were forced into close association with animals which were then domesticated together with planting of seeds.

The **Hilly Flanks** hypothesis, proposed by Robert Braidwood in 1948, suggests that agriculture began in the hilly flanks of the Taurus and Zagros Mountains, and that it developed from intensive focused grain gathering in the region.<sup>11</sup> The **Feasting** model by Brian Hayden<sup>12</sup> suggests that agriculture was driven by ostentatious displays of power, such as throwing feasts to exert dominance which required assembling large quantities of food which drove agricultural technology. The **Demographic theories** were proposed by Carl  
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Sauer<sup>13</sup> and adapted by Lewis Binford<sup>14</sup> and Kent Flannery. They describe an increasingly sedentary population, expanding up to the carrying capacity of the local environment, and requiring more food than can be gathered. Various social and economic factors help drive the need for food. The **evolutionary/intentionality theory**, advanced by scholars including David Rindos<sup>15</sup> is the idea that agriculture is a co-evolutionary adaptation of plants and humans. Starting with domestication by protection of wild plants, followed specialization of location and then domestication. Speaking specifically, the **Innovation and Specialisation Model** was put forward recently by Rupert Gerritsen, in *Australia and the Origins of Agriculture* (2008). This theory considers the question in terms of economic development and treats agriculture as a form of specialisation arising from two factors, higher population densities and innovation in areas of higher net natural productivity, and long-term advantageous information acquisition at nodal points in communication in long range scale-free networks.

As a whole it can be stated that many theorists tried their best to explain the origin of agriculture, but it is not easy task to trace its' historical aspect as it has developed with the development of early civilization and evolutionary in nature. As far as the agriculture in hills are concerned, it has been pivotal to the hilly people as it has been only source of livelihood. Though it is difficult to trace when agriculture has started in hills and when it transform to modern shape.

#### **Status of Agricultural Practices in Western Himalayan state of Himachal Pradesh:**

Agriculture plays a vital role in the Indian economy. Over 70 per cent of the rural households depend on agriculture as their principal means of livelihood. Agriculture along with fisheries and forestry accounts for one-third of the nation's Gross Domestic Product (GDP) and is single largest contributor. Agricultural exports constitute a 5<sup>th</sup> of the total exports of the country. In view of the predominant position of the Agricultural Sector, collection and maintenance of agricultural statistics assume great importance. ([www.http://mospi.nic.in](http://mospi.nic.in))

Himachal Pradesh is predominately an agricultural state and it provides direct employment to about 71 percent of the total population. The Agriculture sector contributes nearly 30 percent of the total state domestic product. The Department of Agriculture is dedicated to serve the farming community by implementing various developmental programmes and disseminating the relevant technology to increase productivity, production and profitability of field crops.

Agriculture contributes nearly 45% to the net state domestic product. It is the main source of income as well as employment in Himachal. About 93% of the state population depends

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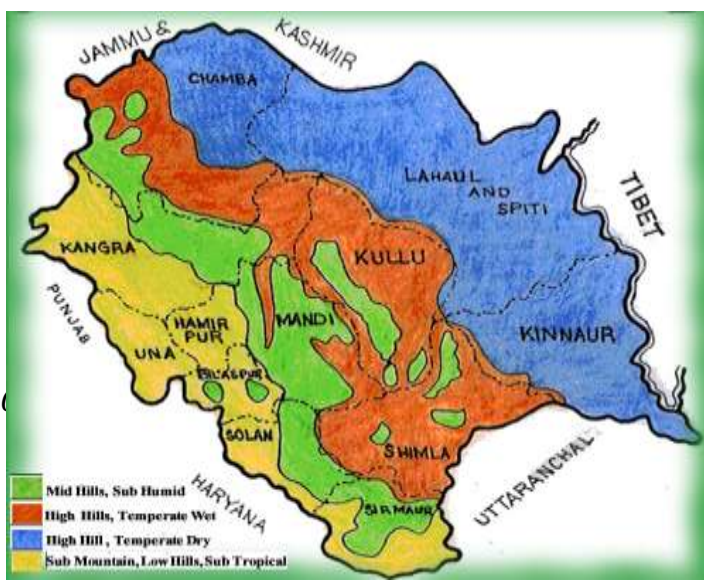
directly or indirectly upon agriculture. About 18-20% area is irrigated and rest is rain fed. However, agriculture in the state suffers from certain limitations, especially in the production of food grains. One of these reasons is that the area under cultivation can't be extended to an appreciable extent. Also, reclamation of land on slopes is not economical and increases environmental degradation. The state can profit more by cultivating cash crops as per the agro-climatic conditions.

The main cereals grown in the state are wheat, maize, rice and barley. Though the state is deficient in food grains, it has gained a lot in other spheres of agricultural production such as seed potato, ginger, vegetables, vegetable seeds, mushrooms, chicory seeds, hops, olives and fig. Special efforts are being made to promote cultivation of crops like olives, figs, hops, mushrooms, flowers, pistachio nuts, sarda melon and saffron.

Fruit cultivation has also proved to be an economic boon. There are huge tracts of land suitable only for growing fruits. Fruit of all cultivation does not add to the problem of soil erosion and its employment potential is more than conventional farming. The yield per acre in terms of income is also much higher. Apple farming produces the maximum income. Fruit growing in the state is fetching over Rs.300 crore annually. The state has also earned the name of the *Apple State of India*.<sup>16</sup> Land husbandry initiatives such as the Mid-Himalayan Watershed Development Project, which includes the Himachal Pradesh Reforestation Project (HPRP), the world's largest clean development mechanism (CDM) undertaking, have improved agricultural yields and productivity, and raised rural household incomes<sup>17</sup>. The natural endowments like soil, land, water etc. are being harnessed in such a way that cherished goals of ecological sustainability, economic upliftment of farming community are achieved.

**Objective:** Prime objective of this paper is to highlight the role of compelling forces which are sowing the seeds to shift from traditional agricultural practices and adopting cash crops.

To meet out the need of the paper, two study districts from Himalayan state Himachal Pradesh has been taken as shown in the figure:2 and out of four agro-climatic zone as shown follows:



Pradesh has been taken as shown in the figure:2 and out of four agro-climatic zone as shown follows:

Figure 1: Showing Agro-climatic Zones of Himachal Pradesh



Source: Agriculture Department, Govt. of Himachal Pradesh

**Methodology:**

By keeping in view the objective of this paper, Kangra and Chamba districts of Indian state of Himachal Pradesh have been selected. The rationale behind selecting these two districts is availability of all four agro-climatic zone (as depicted in the figure:1). In this area all types of agricultural practices are being used by the people. This heterogeneity was the requirement of the present project. Out of these two study districts, Churah, Bhatiyat from Chamba and Jawali and Dharamshala from Kangra districts have been selected (figure: 2&3) and respondents from these areas have been selected randomly and studied minutely and see the responsibility of compelling forces which are responsible for shifting agricultural practices which further are responsible for change in livelihood options.

To observe change in agricultural practices and land use pattern, index number of production and yield which has been divided in different groups and developed by the DESMOAGovernment of India has been used. The crops are classified into two main groups and eight sub-groups as listed below:

**Table 3: Showing Index number of Production in Land Use Pattern**

Category of Food	Type of Food	Name of Food	Available in Himachal Pradesh/ Study Area*
Food grains	Cereals	Rice, Wheat, <i>Jowar</i> , <i>Bajra</i> , Maize, <i>Ragi</i> , Barley and Small Millets. (Crops except Rice and Wheat constitute the sub-group coarse cereals.)	Rice, Wheat, Jowar, Bajara, Maize, Barley and small millets
	Pulses	Gram, Tur and other pulses.	Green/black gram
Non-food grains	Oilseeds	Groundnut, Sesamum, Rapeseed and Mustard, Linseed, Castorseed, Safflower, Nigerseed, Soyabean, Sunflower, Coconut and Cottonseed. (The oilseed crops except Coconut and Cottonseed constitute 9 oilseeds.)	Mustard, sunflower
	Fibres	Cotton, Jute, Mesta and Sannhemp (Jute and Mesta constitute a sub-group.)	NA

Plantation crops	Tea, Coffee and Rubber.	NA
Condiments and Spices	Pepper, Ginger, Garlic, Chillies, Turmeric, Arecanut, Coriander, and Cardamom.	Ginger, Garlic, Chillies, Turmeric
Fruits and Vegetables	Potato, Onion, Banana, Cashewnut, Tapioca and Sweet Potato.	Potato, onion
Other Crops	Sugarcane, Tobacco and Guarseed	Sugarcane

\* Crops being cropped by the farmer in four agro-climatic zones of study areas and undertaken for research

To see the impact of compelling forces on the existing land use pattern the standardised index developed by MoA, Govt. of India has been used. From the existing index at first phase some crops which are used to be cropped by the people of study have been taken and included in the interview schedule for minute observation and data collection. In whole study area different sort of land use pattern is being used and different type of responses have been recorded during primary data collection. In Churah which is mountainous area, people use to grow maize mostly while in Bhatiyaat study area which is comparatively situated in low lying area (in foothills) is having a mix of wheat, maize and paddy in chamba research district. In Kangra study district, Dharamshala is comparatively situated at high elevation and wheat, maize, sugarcane, peddy, ginger, chilles, turmeric, potatoes, onion etc. is being grown while in Jawali, which is situated at low lying area on the bed of Beas river people use to grow mostly wheat, maize, sugarcane, peddy, ginger, chilles, turmeric, potatoes, onion etc. Therefore it can be stated emphatically that study areas have been chosen with varieties of

cropping options. Traditional they are using such land use pattern since their forefathers but now it has been observed during data collection, a shift have been observed, people are shifting from traditional cropping pattern to cash crops because of multiple reasons is the main thrust of the paper.

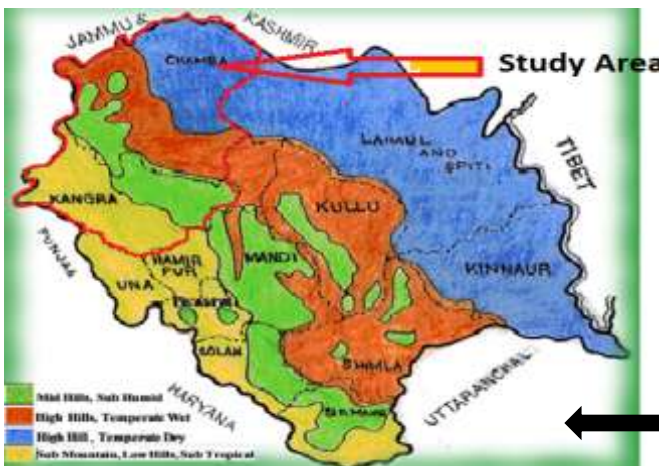


Figure 2: Showing Study Area in Agro-climatic Zone

**Study Area:**

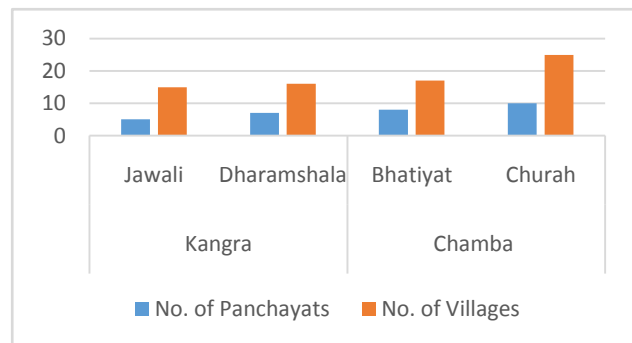
The paper is based on the primary research conducted in two study districts of Himachal Pradesh, India; i.e. Chamba and Kangra. From chamba district two tehsils i.e. Churah and

Bhatiyat; Dharamshala and Jawali Tehsils of Kangra districts (figure:2&3). The study area is known as *Mini Himachal* because of the availability of all four agro-climatic zones and representing whole agricultural conditions and land use pattern being used by the farmers of whole state. The respondents have been selected for primary research as per the following scheme:

Table 1: Showing Panchayat and village wise Distribution of Respondents

Study District	Research Segment	No. of Panchayat (s)*	No of Villages	Number of Respondents
Kangra	Jawali	05	15	50
	Dharamshala	07	16	50
Chamba	Bhatiyat	08	17	50
	Churah	10	25	50
Total		30	73	200

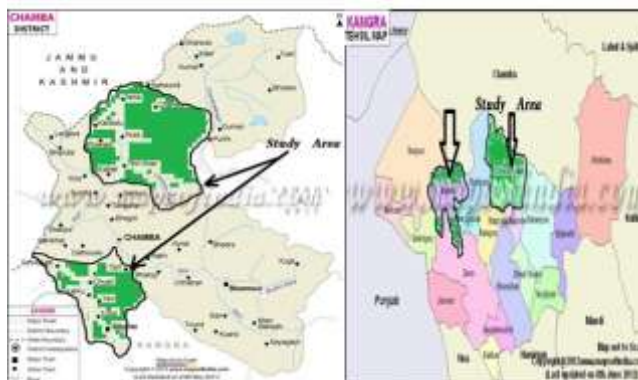
Figure 4: Showing Panchayat and Village wise Distribution of Respondents



Study State and District:



Study Tehsils (Sub-districts):



\*panchayat is the smallest revenue and administrative unit and one panchayat comprises of more than one villages, in some cases it extend to more than 15-20 small villages

As depicted in table and in figure, number of panchayats as well as villages varies from research segment to segment. Reason for this is, in plain area, (Jawali and Dharamshala) the number of villages is more in comparison to the villages situated in the hills (Churah and some parts of Bhatiyat). Population density is also varies in research segments because of

socio-geographical reasons. Total 30 panchayats (*the smallest revenue and administrative unit*), and 73 villages have been sampled for 200 respondents (selecting minimum 3 respondents from 1 village) to arrive at desired conclusion. This methodology has been proved beneficial for wide access to the respondent and to record their perception on different



pre-decided questions in form of questionnaire/interview schedule. Mostly, the index prepared by Directorate of Economics and Statistics, Ministry of Agriculture (DESMOA) Government of India has been used and out of the index of crops, crops available in different research segments have been chosen for primary research to observe the change in land-use pattern and compelling forces which are responsible for such changes.

**Shifting from Traditional cropping to Cash Cropping:** Society has never been static in history, it has always been dynamic and changes have been observed by the people working in different disciplines. As far as agricultural practices are concerned, these have been experiencing evolutionary shift since ages, but with the introduction of scientific innovations in 19<sup>th</sup> century like other segments of society agriculture also experienced numerous changes and today passing through critical stage. On the one hand people (farmer) are leaving agricultural practices (agriculture has become secondary occupation) and on the other new generation is no more interested in agriculture and they are preferring some new alternatives and leaving their traditional agricultural practices.

To see the shift from traditional to cash cropping Indian Himalayan State i.e. Himachal Pradesh has been chosen. Kangra and Chamba districts and Churah, Bhatiyat sub-districts of Chamba district and Dharamshala and Jawali sub-districts of Kangra district has been selected randomly. To see the impact 50 respondents from each research segment (50x4=200) have been taken from 73 villages from 30 panchayats (as depicted in table: 1).

Interview schedule with open and close ended questions have been prepared for 20 respondents at first phase after variable identification by using secondary data available on the topic under study. The prepared interview schedule has been executed over 20 respondents in all four research sub-districts (as shown in table: 2) and after getting desirable responses, the interview schedule has been finalised and finally prepare for final interview. The collected data has been compiled and discussed with experts in the field and finally it was assumed that questionnaire prepared is validated and result oriented.

**Table: 6 Showing Occupational Profile of the Respondents**

Sr.	Type of	Responses from Research Segment				
		Churah	Bhatiyaat	Dharamshala	Jawali	Total

No.	Occupation	P*	S**	P*	S**	P*	S**	P*	S**	P*	S**	
1.	Labourer	02	18	01	15	04	13	03	05	010	51	
2.	Agriculture	34	12	36	08	21	15	25	16	116	51	
3.	Trading/business	07	07	01	10	04	08	03	05	015	30	
4.	Govt. job	07	07	04	05	04	08	06	09	021	29	
5.	Private job	---	---	05	02	12	02	03	02	020	06	
6.	Milling	Water	--	08	--	02	01	--	--	05	015	15
		Electric	--	02	--	01	01	02	--	01	006	06
7.	Fishing	--	10	03	07	02	01	10	06	015	24	
8.	No occupation	--	--	--	--	01	01	--	--	001	01	
	<b>Total</b>	<b>50</b>	<b>64</b>	<b>50</b>	<b>52</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>219</b>	<b>207***</b>	

**\*Primary occupation, \*\* Secondary occupation, \*\*\* N is more than 200 because of the fact that one respondent is having more than one secondary occupation**

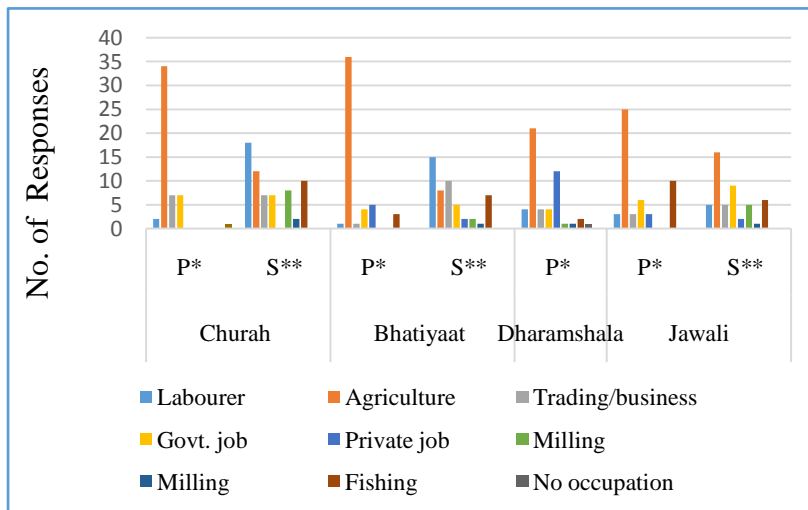


Figure 7:  
Showing Occupational Profile of the Respondents  
P\*= Primary occupation;  
S\*\*= Secondary occupation

Occupation means the ways through which one can earn their living to meet out family need. During variable identification stage only one variable i.e. occupation has been taken, but during the data collection it was observed that people are having more than one occupation at a time. Therefore the occupation has been divided in two parts i.e. primary occupation and secondary occupation. Though more than two occupation have been identified but here only occupations in two categories have been taken. To decide one primary and one secondary occupation, it was decided after the discussion with experts in this field (*Prof HR Sharma, Dean of Social Sciences, Department of Agricultural Economics and Prof.YoginderVerma, Dean of Management Sciences Himachal Pradesh Central University, Dharmashala and Prof. Satish Sharma, Chairman Department of Sociology, Himachal Pradesh University, Shimla, Dr. PK Gupta, Associate Professor of Agricultural Economics, Govt. PG College, Chamba HP*) to consider primary occupation, which is being carried out by the maximum number of family members and involves maximum days during the cropping year and head

of the household as well as family members should involve for maximum days. For secondary occupation, it was decided after the discussion that it is the occupation which is being adopted by the respondents for comparatively less time, and earn less as compare to primary occupation. For example one person can be govt. employee and at a same time he/she could be agriculturalist having margin land holding. Meaning thereby he/she is not in position to meet out their family requirement with marginal land holding (<5ha) so they adopted secondary occupation.

The respondents, as shown in table and figure:7, is the description of study area, what types of occupations (primary as well as secondary) they are having. Maximum number of respondents (116) are having agriculture as their primary occupation and 51 respondents as secondary occupation, which indicates that even today agriculture is most preferable choice of the respondents. Followed by this service sector (govt. as well as private) is the primary occupation of respondents (21 govt. jobs & 20 private jobs), while govt. job become the second preference of the respondents (29) as their secondary occupation. Along with these, labour (10) as primary occupation and maximum (51) as secondary occupation, emphasised the fact that respondents who are having agriculture as their primary occupation are mostly doing labour as secondary occupation in their free time. Some agriculturists have also opened some shops in their respective villages and they use to sell some commodities which are being required by the people of area and earn more money as their secondary occupation. Water-milling and fishing also a preferable occupation adopted by the respondents as primary as well as secondary occupation. On the basis of response received from study area, it is clear that respondents are having more than one primary as well as secondary occupation. Traditionally they are using agriculture as main primary occupation, but with the changing time some more small occupations like labour, trading, tuck shops, milling, fishing have been added and this shift/addition is increasing their income (individual as well as family) and providing more access to amenities in life, they are sending their children to good schools, colleges, professional courses with a hope of better future.

**Table: 8 Showing Income Profile of the Respondents**

Sr	Level	of	Responses from Research Segment
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. N o.	Income	Churah		Bhatiyaat		Dharamshala		Jawali		Total	
		Ind	Fam	Ind	Fam	Ind	Fam	Ind	Fam	Ind	Fam
1.	Up to 50,000	27	15	37	07	34	12	39	09	137	53
2.	50,001-100,000	10	16	05	31	04	20	03	13	022	80
3.	100,001-150,000	05	05	02	03	06	07	03	20	016	35
4.	150,001-200,000	05	05	01	04	01	05	--	03	007	17
5.	200,001-250,000	02	03	--	--	01	--	01	02	004	05
6.	250,001-300,000	--	02	02	--	02	01	02	--	006	03
7.	300,001-350,000	01	02	01	01	--	02	02	--	004	05
8.	350,001 and above	--	02	02	04	02	05	--	03	004	14
9.	No Income	--	--	--	--	--	--	--	--		
	<b>Total</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>199*</b>	<b>212*</b>

Ind= individual; Fam=family

\*N is more/less than 200 because of multiple reasons

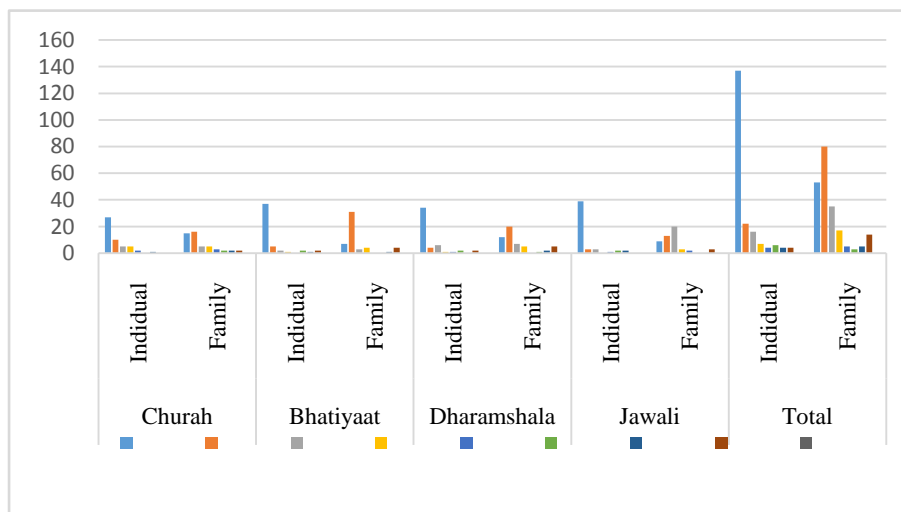


Figure 8: Showing Individual and Family Income of the Respondents

Income level is the detriment of wellbeing of any household as well as of

availability of amenities for the family members. It is also a deciding factor for life opportunities and detrimental for access to other deciding important factors for many opportunities for family members and also fundamental in deciding the overall status of whole village/area. Same is the case with study area undertaken.

As it is clear table and figure: 8 that maximum number of respondents i.e. 137 are earning up to 50,000 rupees in category of individual income while 53 respondents have responded that their family income is Rs. 50,000 per annum. Followed by this 22 respondents are earning between 50,000-100,000 rupees individually per annum and 80 respondents have responded that their family in this category. The availability of income in these two categories are clear

indications that maximum respondents in the study area are relatively poor to very poor and earning round 85 USD per annum as individual income and round 1700 USD annually as family income. It is because of fact all these respondents are having agriculture as their primary occupation (as shown in table: 7). It has been observed during data collection that amenities they are having in the household are not up-to the mark and they are compelled to live in inhuman conditions, their children are malnutrition, children are compelled to stay back at home in Churah research segment and some progressive farmers have changed their land-using pattern with a hope of new life. They are trying their level best to come out of available conditions. In next category 16 respondents have responded that they are earning between 1 lakh to 1.5 lakh per annum as an individual and 35 respondents as family income. Followed by this category 1.5 lakh to 2 lakh, only 7 respondents' falls in this category (individual income) and 17 respondents are having family income of this category. 4 respondents in individual and 5 respondents in family income categories have responded that they earn between 2-2.5 lakh of rupees annually. The upper income category i.e. between 2-2.5 lakh is almost missed in respondents of almost all research segment; families of 2 respondents from Churah research segment fall in this income category while in Bhatiyat there is no respondent who fall in this category and in Dharamshala there are only 02 respondents in individual income and 1 in family income and in Jawali research segment only 2 respondents have responded in category of individual income; totalling thereby 6 respondents in individual family income category and 3 in family income category. The next category of income is ranging between 3-3.5 lakhs has got small representation, only 4 respondents in individual income category and 5 in family income category have responded. In the last category 3.5 lakh and above 4 respondents have responded in individual income category and 5 respondents in family income category.

It is clear from the above data that respondents in various categories have responded invariably and data emphatically suggested that the respondents in minimum income groups are having mostly agriculture as their primary occupation. Agriculture being an insecure occupation and largely depends on rain/monsoon is not a sure/fixed income of source and along with this it is also a fact that whatever respondents are producing they are retaining maximum for their own use because maximum farmers are marginal in the study area having less than 5 hectare of cultivable land. More-over they are using traditional way of farming because of which the outcome from agriculture is very low and they compelled to shift from

traditional cropping to cash cropping and now expected to have a better income and better way of living.

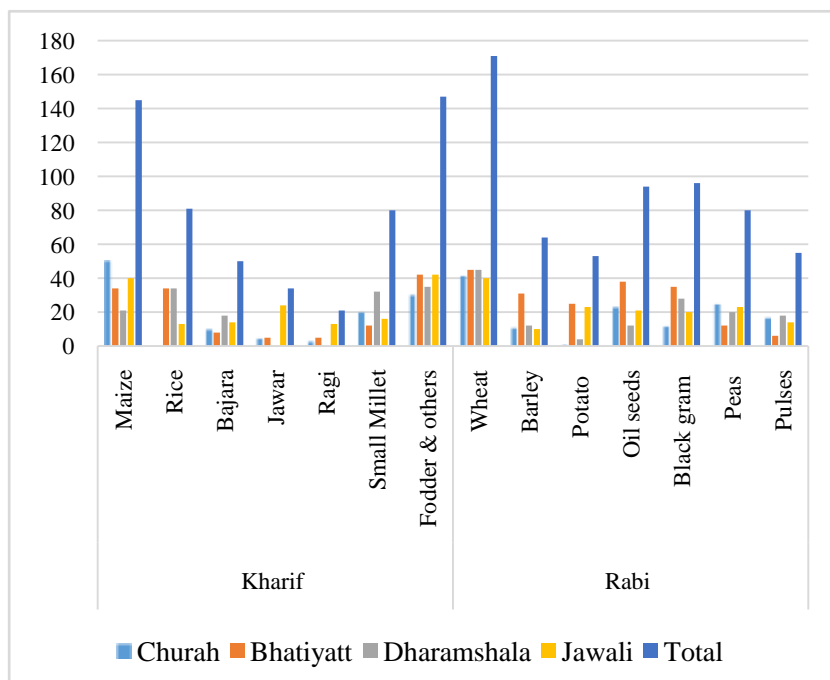
Cropping Pattern	Name of Crop	Responses from Respondents				
		Churah	Bhatiyatt	Dharamshala	Jawali	Total
Kharif	Maize	50	34	21	40	145
	Rice	--	34	34	13	81
	Bajara	10	08	18	14	50
	Jawar	05	05	--	24	34
	Ragi	03	05	--	13	21
	Small Millet	20	12	32	16	80
	Fodder & others	30	42	35	42	147
	<b>Total</b>	<b>118*</b>	<b>140*</b>	<b>140*</b>	<b>162*</b>	<b>560*</b>
Rabi	Wheat	41	45	45	40	171
	Barley	11	31	12	10	064
	Potato	01	25	04	23	053
	Oil seeds	23	38	12	21	094
	Black gram	12	35	28	20	096
	Peas	25	12	20	23	080
	Pulses	17	06	18	14	055
	<b>Total</b>	<b>130*</b>	<b>192*</b>	<b>139*</b>	<b>151*</b>	<b>613</b>

Table 9: Showing Traditional Crops Produced by the Respondents

\*N is more than more than usual sample because respondents crop more than one crop in one cropping session

Figure: 9 Showing Traditional Crops Produced by the Respondents

Traditional cropping pattern and land use of any area indicates the traditional set-up of society and their traditional standing in society. It is also indicative that what types of crops they are cropping



to rare their life as well as family. To see agricultural practices and land use pattern, index number of production and yield standardized index developed by the DESMOAGovernment

of India has been used. On the basis of this index some commonly used crops in study area have been taken into account. On the basis of goal/objectives whole cropping patterns have been divided in two broad patterns i.e. *Kharif* and *Rabi* which further divided in maize, rice, bajara, ragi, small millets and fodder in *Kharif* and wheat, barley, potato, oil seeds, black gram, peas and pulses in *rabi*.

As it is evident from table and figure; 9 that maximum respondents are producing maize (145) in kharif and wheat (171) in rabi traditional because of the fact these two crops are being used traditionally and largely by the respondents in research segments. Maize is being cropped in churah research segment by all respondents because of geographical reasons. The area falls in relative cold zone and it is being used by people/respondent whole year, while in other research segments this crop is being cropped relatively less. Rice is being cropped by 81 respondents in three research segments i.e. Bhatiyat, Dharamshala and Jawali and bajara has also got considerable response (50), ragi and small millet are being cropped by 21 and 80 respondents respectively and fodder is being cropped by the maximum number of respondents (147) which shows the scarcity of fodder in this cattle rearing zones of Himachal Pradesh. All respondents are cropping more than one crop at a time in all research segments. In *rabi* cropping pattern, along with traditionally mostly grown crop i.e. wheat, respondents in specific and people in general are cropping barley, potatoes, oil seeds, black grams, peas and pulses. Barely which is useful coarser food is being cropped by 64 respondents and potato by 53 respondents. Oil seeds in form of mustard, *soya beans* (*Glycine max*) etc. are being cropped by 94 respondents while peas is coming as new emerging crop and mostly being cropped in the high reaches of the study area. Pulses has also got considerable representation in the sample and being cropped by 55 respondents.

#### **Change in Traditional Cropping Pattern:**

To see change in the traditional cropping pattern, two cropping patterns i.e. kharif and rabi have been taken. Kharif means *autumn* in Arabic and kharif land use pattern refer to the planting, cultivation and harvesting of any domesticated plant sown in the rainy (monsoon) season in the Asian subcontinent, usually start in June and ends in October during the south-west monsoon season. Main crops of this season are Maize, Rice, Bajara, Jawar, Ragi, Small millets and fodder. Other cropping season i.e. Rabi means "*spring*" in Arabic, and the Rabi crops are grown between the months of sown in November and harvest in April. Major Rabi crop is wheat in India followed by barley, mustard, sesame and peas. (*Balfour, Edward (1885)*). For this research wheat, barley, pulses, oil seeds, black gram crops have been taken.  
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It is noteworthy that crops of both patterns are being cropped by the people in four agro-climatic zones in study districts (as depicted in table/figure: 9). Following table:10 is the detailed description of change in land use pattern along with the duration of land use pattern being used by the respondents.

**Table10:Showing Duration of Kharif Cropping Pattern being Used/Shift by the Respondents**

Crop (s)	Research Segments	Since How many Years					Change Presently	
		10	20	30	40	50	Yes	No
	Churah	--	--	--	10	40	18	32
	Bhatiyat	05	06	--	09	28	30	18
	Dharamshala	04	02	06	16	22	21	29
	Jawali	12	02	03	06	25	29	20
Rice	Churah	--	--	--	--	11	05	06
	Bhatiyat	08	06	05	11	20	23	17
	Dharamshala	06	07	09	25	03	18	32
	Jawali	15	06	--	07	17	27	23
Bajra	Churah	24	05	--	--	--	18	11
	Bhatiyat	25	21	--	--	--	11	35
	Dharamshala	21	13	04	02	--	04	36
	Jawali	10	03	06	08	05	12	20
Jawar	Churah	--	--	07	06	--	04	09
	Bhatiyat	12	04	03	06	--	02	23
	Dharamshala	07	04	06	10	05	08	24
	Jawali	21	05	07	02	--	06	29
Ragi	Churah	--	12	05	09	--	16	10
	Bhatiyat	05	02	06	12	18	25	18
	Dharamshala	13	03	05	09	20	36	14
	Jawali	18	13	07	06	--	05	39
Small millets	Churah	03	11	07	04	22	23	24
	Bhatiyat	10	02	04	03	--	08	11
	Dharamshala	05	07	10	04	--	08	18
	Jawali	11	05	08	04	06	07	27
Fodder	Churah	25	20	02	--	--	05	42
	Bhatiyat	30	12	08	--	--	06	44
	Dharamshala	20	15	07	--	--	05	37
	Jawali	13	03	05	09	20	36	14



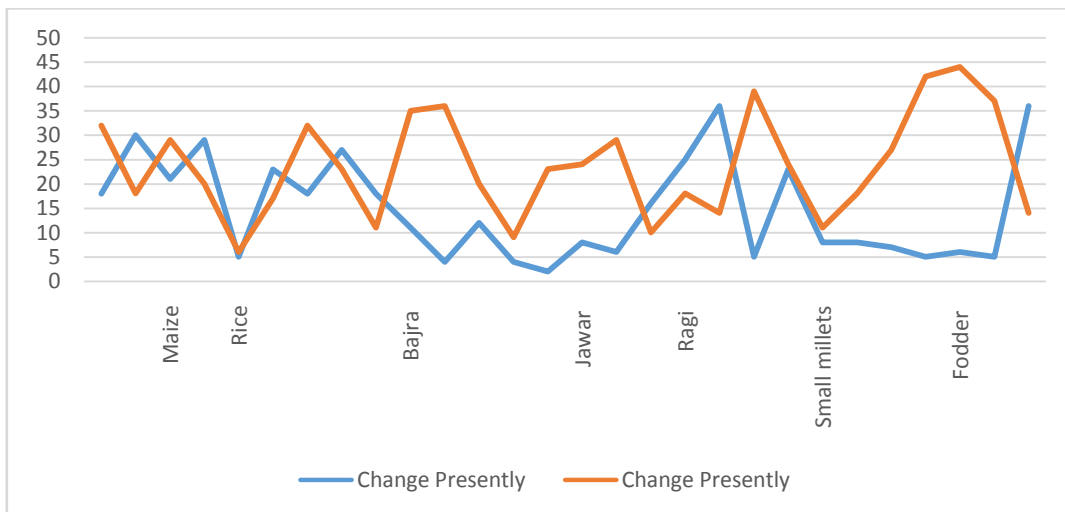
To get the responses, as depicted in table: 10, on Kharif cropping pattern, main crops of this pattern i.e. Maize, Rice, Bajara, Jawar, Ragi, Small millets and fodder have been chosen. Further, to acquaint with the responses minutely data on one crop from all four research segments have been codified. To observe change in existing crops of land use pattern, close ended response i.e. yes and no has been used. Mostly maize is being cultivated by the respondents in all research segments maximum for the last 50 years. In some areas in research segments like Bhatiyat, Dharamshala and Jawali some respondents have started maize cultivation 10 years ago and some respondents have started it 20 -40 years ago but mostly respondents in three segments are cultivating maize for the last 50 years. However, change in



maize cultivation has also been observed and respondents in all segments have responded that they have shifted from traditional maize cropping (as depicted in table: 10). It is mention worthy here that only those farmers have shifted who have more/excess land and margin farmers are compelled to go with traditional cropping patterns.

Second main crop of this pattern is being cultivated mostly in three research segments expect Churah, because of the fact that rice cultivation needs irrigational facilities which is available very less in Churah, therefore only 11 respondents in lower Churah are cultivating rice. In other segments some respondents 8,6 and 15 respectively have started rice cultivation in Bhatiyat, Dharamshala and Jawali research segments while 6,7 and 6 respondents are cultivating rice for the last 20 years. This crop has also experienced change in all four segments. 5, 23, 18 and 27 respondents in Churah, Bhatiyat, Dharamshala and Jawali respectively has shifted from this traditional cropping which they have cultivating for the last maximum 10-50 years. Bajara has been newly introduced in all research segments with the effort of govt. as well as to meet out the growing need of fodder and seed. Under barren area development plan, Bajara is being cropped in arid areas and people are getting benefits. Jawar is the next crop in study area which is being cropped almost in all research segments for the last 20-30 years, but in Bhatiyat and Dharamshala it is being cropped by 18 and 20 respondents respectively for the last 50 years. Jawar is being cropped in Churah and Jawali is recent phenomena and people have started its' cultivation recently, however it is not being cropped for commercial use and commercialization and vital use of this crop is still awaited, hopefully in the coming time it could be one of the best options available to the people of the area.

**Figure: 10 Showing Duration of Kharif Cropping Pattern being Used/Shift by the Respondents**



Ragi (scientific name: *Eleusinecoracana*) is known as *Kodra* in local dialect, is an annual cereal is being cropped in all research segments. Speaking specifically, ragi is being grown for the last 20-50 years in Churah research segment, for the last 10-50 years in remaining three segments. It is being grown in research area for the last 50 years, whereas in some cases it is being grown recently for the

last 10 years. Shift in cropping of this 50 years old crop has been observed as more than 50 percent respondents have shifted to other crops useful to them also capable to meet out their daily needs. Small millets locally known as *Suilis* a cereal which is grown along with maize in the field or in some cases it is also being cultivated separately. It is being cultivated in four research segments for the last 10-40 years and in Jawali segment it is being cropped for the last 50 years. At present it has been changed mostly in Churah research segment and in remaining other research segments shift is less in comparison to Churah. Fodder is growing as emerging crop these days, however it was unknown to study area in last 40-50 years, but in 10-30 years it has been increased and at present in Jawali research segment it has shifted as more than 36 respondents have been reported who had changed the existing fodder cultivation.

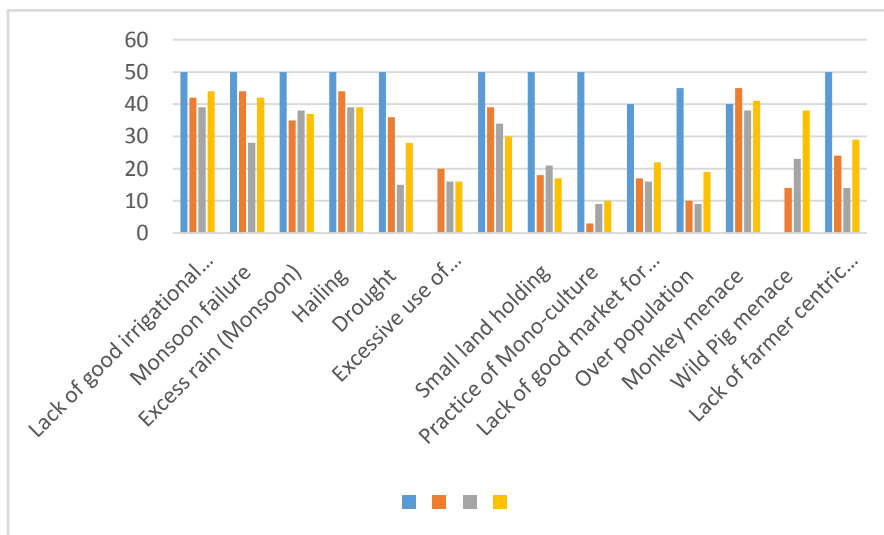
**Table 11: Showing Compelling Forces Threatening to Agricultural Practices and Responsible for Shift from Traditional Agricultural Practices**

S N	Compelling Force (s)	Churah	Bhatiyat	Dharamshala	Jawali	Total	
1.	Lack of good irrigational facilities	50	42	39	44	175	
2.	Natural Factors	Monsoon failure	50	44	28	42	
		Excess rain (Monsoon)	50	35	38	37	160
		Hailing	50	44	39	39	172
		Drought	50	36	15	28	129
3.	Excessive use of fertilizers and pesticide	---	20	16	16	52	
4.	Lack of good water management	50	39	34	30	153	
5.	Small land holding	50	18	21	17	106	
6.	Practice of Mono-culture	50	03	09	10	072	
7.	Lack of good market for produce	40	17	16	22	095	
8.	Over population	45	10	09	19	083	
9.	Monkey menace	40	45	38	41	164	
10.	Wild Pig menace	---	14	23	38	075	
11.	Lack of farmer centric policies of the govt.	50	24	14	29	117	

Table: 10 suggested changes in land-use pattern and respondents have shifted from traditional cropping pattern to cash cropping and responsible for change in the lives of people and changed life style with newly added amenities in the household is making their lives more comfortable. It is indicating a positive trend at present. To put on record the responses of respondents on compelling forces 19 variables have been identified in first phase of research and standardized latter on after doing pilot and confined up to 11 sub-variables. Almost all sub-variables of table: 11 got response. As indicated in table 11 and figure: 12 lack of irrigational facilities got maximum score (175) in all four research segment and natural factors like; hailing got the second highest response (172), excess rain

(160) monsoon failure (144) and drought (129). Money menace plays an important role and compelled respondents in particular and native of areas in general to change land use pattern as asserted by 164 respondents. *It has been observed during interview and discussion with the respondents that people had left their land and stopped cultivation because of monkeys.* 153 respondents have responded that there is no good water management marginal farmer and poor people are not getting as it is being controlled as distributed by influential people. Small land holding is one of major reasons which compelled the respondent to change their land use pattern as emphasized by more than 50 percent respondents i.e. 106. Land-holding wise more than 85 percent respondents falls in the category of marginal farmers. Lack of good market place for the produce has been merged as major factor

responsible for change as people got frosted when they remained unable to get the due price for their produce. Wild pig and un-manned cows has also been proved one of the compelling force and 75 respondents, responded to this sub-variable. Over population and mono-culture have got 83 and 72 responses respectively.



*Fugure 12: Showing Compelling Forces Threatening to Agricultural Practices and Responsible for Shift from Traditional Agricultural Practices*



As a whole it can be stated that however almost all variables got mixed response, but lack of irrigational facilities, natural reasons, lack of water management and monkey menace got maximum score and required special attention of policy makers, planners and executor. It is necessary to save the traditional cropping in hills, though it has also been observed that the shift is good and have a capacity to change the lives as well as life style of the people in general and respondent in particular.

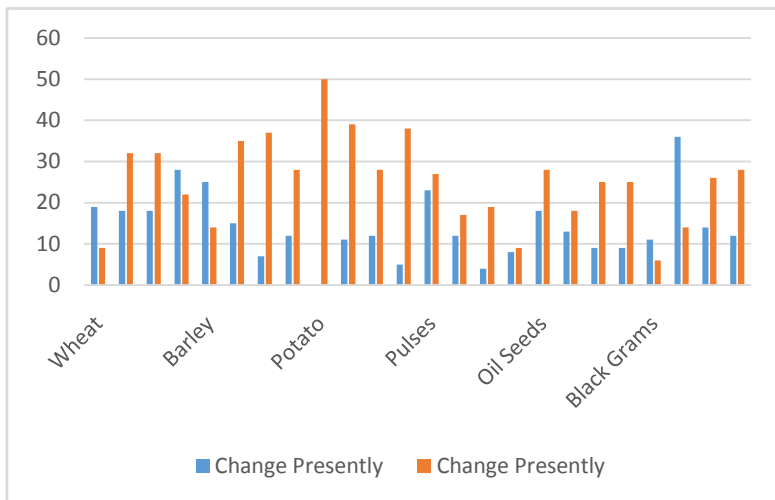


Figure 11: Showing Change in Land-use patter in Rabi crops

On the basis of above description, it can be stated that respondents use to cultivate traditional crops for the last 50 years and some respondents had introduced crops 10 years earlier, meaning thereby the slot of 50 years has been taken to see the change in traditional cropping pattern which are being used by respondents in specific and people of the research area/Himachal Pradesh/India in general. In this table question at present has also been addressed. Maximum respondents in this segments have responded that the cropping patterns being used them have undergone change over the period of 50 years and at present there are certain compelling forces which compelled them to change the existing land-use pattern. It is also noteworthy here that only those respondents have changed land-use who were having more than 5 hectare land (agricultural and horticultural). First priority of the land-users is to ensure enough food for their families and then they shifted from traditional cropping patterns to cash cropping. They are experimenting change in empty land available with them. The yield is more than the traditional cropping; particularly in case of potatoes, peas, beans, fruits like apples and apricots they are doing very good and this sort of shift has changed their lives and open new horizons and they are sending to children out of village/area for higher education (in some cases for professional education). It has also been observed by the researcher that in coming time, this shift will help the people to remove the tag of backward area and backwardness which at present attached to them and to the area.

Figure12: Showing Kharif and Rabi Land Use/change Pattern

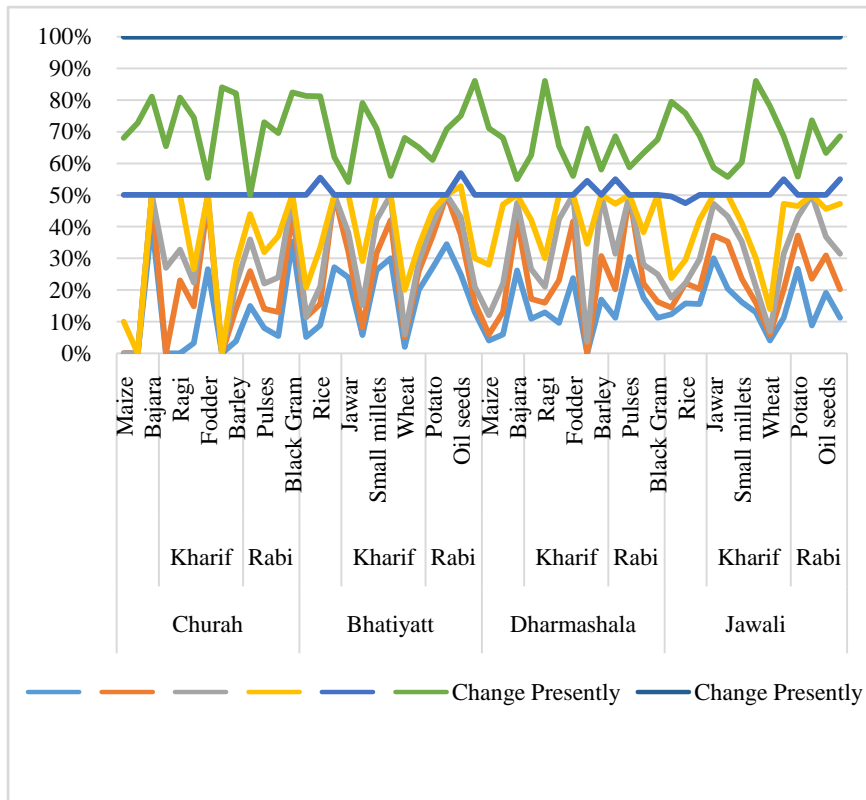


Figure:12 is collectively graphical presentation of the change in both land-use pattern being experienced by the respondents specifically and of whole study area in general. It is evident from the figure that traditional cropping pattern has undergone change (between 50 to 90 percent) and it is traditional set-up of society in study area which is shifting and changing the economy of the areas.

**Illustrations of Shift in Agricultural Practices:**

Most important fact observed during data collection is only those people/farmers are changing their land use pattern who are having more than 2 acre land and the marginal farmers having less than 1 acre land for agricultural activities are not in position to change their land use patter. They are of the view, wheat and maize (traditional crops) are fundamental to fulfil the needs of their families, so it can be stated emphatically that change in land use pattern is being adopted by the big farmer and the conditions of small farmers is same as it was before 2001.

View of change in Land Use pattern in Sanuh Village situated at outer Churah research segment, photograph taken by the researcher on 1<sup>st</sup> of June, 2013





Date: 1<sup>st</sup> June, 2013  
Name: Sh. Jagdish Chand  
Village (Research Segment): Thasund (outer Churah)  
Geographical coordinates: 31° 7' N; 75° 9' E  
Age: 56

---

Primarily serving as government employee and secondarily agriculture, horticulturist, vegetable growers and on and average earning more than 2 Lakhs per harvest. He is having 4 acre agriculture land, 3 acre horticultural Land and use to grow vegetables in 1 acre. He has been growing traditional is crops for the last more than 45 years but he has changed the land use pattern 12 years ago (2001) and start growing vegetables and apple in the field where he use to grown traditional wheat and maize. He stopped even cultivating rice. Prior to 2001, he earned more than 25,000 rupees per harvest from traditional cropping. After the change in land use pattern, he use to grow beans, peas, potatoes, nuts, palm, apricots, apple and earning more than 2 lakh rupees per harvest. The buyers come to their native place, which save their time, money as well as energy. He has been motivated by the local inhabitants to change the land use pattern. The main reason for the shift is the money, the amount of money is high as compared to traditional crops.

### **Case Study-I:**

It has been observed during research visit of study that almost all farmers are having minimum one acre land, in other words average farmers are marginal. Big farmers having more than 5 acre land are shifting/changing their land use pattern because they are having extra land and for marginal farmer it is possible to change their land use pattern.

### **Case Study-II**

It has been observed during research visit of study that almost all farmers are having minimum one acre land, in other words average farmers are marginal. Big farmers having more than 5 acre land are shifting/changing their land use pattern because they are having extra land and for marginal farmer it is possible to change their land use pattern.



Date: 2<sup>nd</sup> June, 2013  
Name: Sh. Baldev Singh  
Village (Research Segment): Khalus/Diur  
Geographical coordinates: 32° 7' N 70° 1' E  
Age: 60

---

60 years old agriculturalist by primary occupation and shop keeper by secondary, is having a family of 21 members. He is having more than 4 acres of land. He use to cultivate traditional crops since his forefathers. But the pressure of increase in the size of family compelled him to think differently.

At present he stopped traditional crops and shifted toward cash crops. He own apple orchard with more than 100 plants and earning more than 50 thousand out of the sale of his organic apple. 3 years earlier he completely stopped the sowing of wheat. 12 years earlier, he has shifted traditional crops in more than 1 acre land and use to grow potatoes, cauliflower, cabbage, tomatoes, French beans and peas.

He is producing 75 quintal (1 quintal=100 kg) potato in 5 acre, nuts round one quintal, 15 quintal beans in one Bigha (1 bigha=809.288m<sup>2</sup>), 60 quintal tomato in one bigha and 25 quintal cauliflower and cabbage in one bigha, which is an evidence of huge change in traditional land use pattern. Earlier he used to produce maximum 3-4 quintal maize and wheat in one bigha which is comparatively very less in terms of earning.

He is being motivated by the agricultural department at latter stage, but initially the increasing size of family and self-motivation to do something extraordinary compelled him to change land use pattern.

## Conclusion

On the basis of above description, citations, tabulation, pictorial and graphic presentation it can be stated emphatically that there is a shift in the land-use pattern over the period of time. To see this shift respondents have been asked to respond in the span of 10-50 years. As per the requirement of this chapter, data from four research segments have been collected by interviewing 200 respondents spreading in four agro-climatic zones by using interview schedule equipped with close-ended and open-ended questions and with the vital use of exploratory and descriptive method of research in the state of Himachal Pradesh, India during 2012-13.

On the basis of data it can concluded that all important social segments of Indian social system has been sampled for data collection, dividing broadly in three categories i.e. non-scheduled; scheduled; minorities. The occupational and income profile of the respondents have also been prepared which suggested that respondents are earning average very less income at individual level as well as at family level in both the cases i.e. monthly and annually. There are very few respondents who are having two occupation (primary and secondary); in primary occupation they are doing some work in govt. or semi-govt. sector and as a secondary occupation they are practicing agricultural practices. By adopting both they are having good income and this case is not applicable in case of respondents are doing some labour work. This reflection is a main determinant of household amenities and with the increasing pressure of size of family and growing children and their increasing needs compelled the respondents to shift from traditional cropping pattern to cash crops. For food stuffs, respondents are of the view that they purchased it from the *ration depots* (fair price shops) available in the village and they have also status of BPL (below poverty line) and can have food stuffs for whole month by paying mere 500 rupees. Therefore, if they shifted from traditional cropping pattern then there is no harm and their food security is not being threaten. What the question remain what if the fair price shops or govt. policy for BPL stops?



Showing Step-Terrace agricultural fields in Bhatiyat  
Research Sub-district of Chamba district



Maximum respondents are marginal farmers having less than 5 hectares land and they are cropping traditional crops since ages (from their forefathers).

Only respondents having more land, have shifted from traditional cropping as they have



separate land for cropping and separate land for horticulture and sericulture. Agriculture in research area largely depends on the nature, as in step agricultural fields (in Churah, some parts of Bhatiyat and Dharamshala) is a real threat because of the such area have not irrigational facilities on the one hand and have to face the wrath of nature on the other. One strong blow of air ruined whole crop within no time (particular the maize), which is also one of the reason responsible for change in land use and respondent shifted to horticulture which is less risky as compared to maize. Though hailing can ruin fruits within no time, but in spite of this fact people are shifting which is also threatening the availability of food in the study area.

The compelling forces responsible for the change in the study area have been recorded through interview schedules. Responses received on schedules suggested that there are certain compelling forces which compelled the respondents in specific and people in general to change their land-use pattern which they use to practices since ages from their forefathers. At present most prominent factors responsible for changes are natural factors like failure of monsoon, hailing, money menace, wild-pig, stayed cows, lack of irrigational facilities, excessive use of fertilizers/pesticides, small land holding, mono culture, increasing population, lack of market facilities at local level, lack of implementation of farmer centric govt. policies are some reasons which compelled the farmers to shift from tradition cultivation to cash cropping or to other options by using which they can earn money.



*Idol of deity is believed to safeguard the crops of farmer, situated at top of the fields in outer churah, a village situated at far-away from the cities, even today people use to be associated with the local deity and leading a happy life.*



It is also noteworthy here that during data collection and interaction with the respondents and other people of study areas, once agriculture was very pious and accountable way of life, earlier it meant “agri” and “culture” which means farm and way of life respectively, meaning thereby “way of life revolving the farms” which was pan-indian in character. Now there is a value shift, earlier it was spiritual based and now it is utility based. Earlier whenever any farmer start sowing first of all he worship his deity and devote his expected crop to Him and pray Him to take care of all

concerns related to fields/farming, now it is not like this now agriculture is being practice by using mechanical devices where such faith or believes have no place. People are of the view that whatever we are facing these days it is because of the ignorance of earlier values which we had and which we use to practice before cultivation, during and after cultivation and even after the harvest some amount of produce was devoted to the deity as a gratitude to take care of their crops, first farmer use to offer it by visiting temple and then they use it for their home use or sell in the market, now trend it is reverse.

It is strong belief of the researcher, *which could be unscientific*, that advocacy should be done at local level in whole study area specifically and in other parts of country in general that farmers should promoted to retrieve the age-old believes, whatever they were practising in form of traditional/indigenous knowledge related to agricultural practices. We should accept that even technology has some limits and we cannot rely on technology fully, the strong beliefs of people have also a great concern which must be addressed and we should see this shifting in traditional cropping pattern from this angle also so that the problem of food security can be solved. In study area, however, the evidence of food insecurity has not been found overtly because of govt. policies of public distribution system (PDS), but if see from data perspective it is being threaten as there is a detrimental decrease in the yield over the years and farmers/govt. are not capable to cope it. The government must act according to the needs and aspiration of the farmers at local level and policies must be framed after visiting farms of the farmers in local areas and it should *local specific* not *country specific* because every area has specific geo-morphological characteristics and same plan cannot be applied to all.

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