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An Interplay of Agriculture and Urbanisation in Himachal Pradesh

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Abstract

The scenario of urbanisation and agriculture in hilly areas is different from the plain regions. Of late, the sustainability issues in agriculture have come to fore, and there is a paradigm shift to 'green methods'. Himachal Pradesh has experienced substantial agricultural transformation over time. This article seeks to examine the trends in agriculture and urbanisation in the state, along with the implications of this interaction. The results revealed a noticeable decrease in ploughable land along with an increase in land put to non-agricultural uses. This calls for a cautionary approach concerning land use policy in hills so that the food and livelihood security of the peasantry is not affected, along with concomitant ecological repercussions of development. Simultaneously, positive externalities of urbanisation need to be harnessed to the maximum extent for the benefit of hill people with limited livelihood options.

Keywords: Agriculture, Built-Up Area, Land Use Policy, Himachal Pradesh, Urbanisation

India is now the most populated nation in the world, having outpaced China. According to the 'State of World Population Report' of the United Nations Population Fund, India's population was estimated at 1.428 billion in 2023, as against 1.425 billion for China. The population of India stood at 1.210 billion in 2011, of which 31.1per cent lived in urban areas (Anonymous 2011). India is the second largest urban system in the world, with almost 11per cent of the total global urban population living in cities. Urban growth is expected to contribute to 73 per cent of the total population increase by 2036 (Anonymous 2019a). On the other side, Indian cities with just 3 per cent of the country's land, contribute over 60 per cent to the country's GDP. As such, it would bring a plethora of opportunities for economic growth and development with all its attendant pros and cons. As such, the growing urbanisation has several concomitant implications for Indian agriculture.

India became a food-surplus nation about four decades ago, shedding its label of food-deficient state on account of the country-wide adoption of green revolution technologies, duly supported by a proactive policy regime of the government ensuring massive investments in infrastructure such as irrigation, power, credit, research and extension, *etc*. Indian agriculture, of late, has started confronting many challenges that are manifesting into sustainability issues. The challenges encountered relate to agro-climatic, environmental, and socio-economic dimensions. This has led to a fresh narrative of "evergreen revolution based on sustainable thinking" to feed the ever-growing numbers (Anonymous 2017). The four-pronged strategy to double the farmers' income was suggested to encompass development initiatives, technology and innovations, an appropriate mix of policies and

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viable institutions, keeping in sight the sustainability concerns (Chand 2017). This brought in twin policy paradigm shifts in Indian agriculture: first, from 'production to income-oriented' approach for the welfare of the farming community and secondly from the philosophy of 'green revolution-led' productivity to 'green methods' led sustainability in the agricultural landscape (Anonymous 2019b).

The small Western-Himalayan state of Himachal Pradesh has been the epitome of successful development planning, especially for hilly states. Agriculture and allied activities are the main occupation of the people in the state and, as such, have an important place in the state economy. These provided direct employment to about 58.71 per cent of total workers in the state. These activities are an important source of state income as they contribute about 13.70 per cent of the total Gross State Value Added (Anonymous 2024). A preponderant majority of the farmers are small and marginal. Only around 12.0 per cent of the geographical area is under plough. Agriculture in this state has undergone a massive transformation from subsistence agriculture to high-value commercial agriculture, producing. Many seasonal vegetables, fruits, and flowers, besides such crops as maize, paddy, wheat, barley, *etc*.

The land use pattern of a region is an outcome of physiographical, environmental, demographic, socio-economic, technological and institutional factors. The information on land use changes is necessary for understanding the relationships between human beings and the natural environment, both over space and time. Such an understanding helps monitor these changes to better plan the use of the most important scarce resource by government agencies and environmental managers. Though Himachal Pradesh is the least urbanised state in the country, having only one-tenth of its total population living in urban areas, rapid population increase has given rise to a growth of peri-town sprawls throughout the state. As such, many fertile crop fields and sparsely tree-growing/barren/grass lands and hill slopes have been replaced by the built-up area in and around the vicinity of these small towns. With this background in view, the present paper seeks to capture the extent of such land use changes and examine the interplay of urban sprawl for agriculture in the state.

MATERIALS AND METHODS

To capture the extent of land use changes, cropping pattern, area and yield levels and urbanisation trends in the state, secondary data were used. Simple tabular analysis using moving averages, ratios and percentages was done to interpret the results. Also, for the three selected towns, namely, Solan, Kullu and Hamirpur, which are district headquarters also, and have seen heavy expansion of urban sprawling, the GIS data relating to the land use changes were extracted and used for the period 2018-2023. After comparing the features of different imageries for the suitability of data, the Satellite imagery Sentinel-2 was used for capturing the extent of change in land use data. This imagery provided higher spatial resolution, more frequent revisits, broader spectral coverage, improved cloud penetration, and accessible data that contributed to its effectiveness *vis-à-vis* other imageries in monitoring urban sprawl.

RESULTS AND DISCUSSION

An Overview of Agriculture

Land Use Changes

The trends in different land use categories in the state have been presented in Table 1. The total reporting area in the state increased by 1643.848 thousand hectares from 2933.600 thousand hectares in Triennium Ending (TE) 1974-75 to 4576.678 thousand hectares in Triennium Ending (TE) 2019-20. It is revealed that the proportion of net sown area to the total area has declined from 18.85 per cent in 1974-75 to 11.77 per cent in 2019-20. Here, it is also important to note that in absolute terms, the net sown area in the state decreased by 41.604 thousand hectares between 1989-90 and 2019-20. The area under non-agricultural uses increased by about 156.0 thousand hectares during this period. Current fallows also showed a marginal increase of about 27.0 thousand hectares, and 'other fallows' increased by 5.0 thousand hectares during the same period. In absolute terms, the area under culturable waste also declined by about 7.0 thousand hectares between 1989-90 and 2019-20. Thus, it is amply clear that the area in Himachal Pradesh has been witnessing a squeeze on all land use categories amenable to cultivation. Similar results have been reported by

Table 1. Trends in land use categories in Himachal Pradesh, 1974-75 to 2019-20 ('000 ha)

Triennium Ending (TE)	Reporting Area	Forests	Barren	Non-agril. Uses	Culturable Wastes	Permanent Pastures	Misc. Tree Crops	Current Fallows	Other Fallows	Net Sown Area
1974-75	2933.600 (100.00)	638.033 (21.75)	130.233 (4.44)	195.600 (6.67)	129.500 (4.41)	1187.167 (40.47)	43.000 (1.47)	53.533 (1.82)	3.600 (0.12)	552.933 (18.85)
1989-90	3344.100 (100.00)	926.333 (28.75)	191.267 (5.56)	204.733 (6.01)	126.533 (3.76)	1213.933 (35.41)	42.500 (1.32)	42.633 (1.32)	16.067 (0.59)	580.133 (17.29)
2004-05	4544.054 (100.00)	1099.838 (24.20)	716.92 (15.78)	410.293 (9.03)	126.019 (2.77)	1511.184 (33.26)	63.037 (1.39)	58.957 (1.30)	15.257 (0.34)	542.548 (11.94)
2019-20	4576.678 (100.00)	1124.025 (24.56)	772.725 (16.88)	361.229 (7.89)	119.245 (2.61)	1500.161 (32.80)	69.552 (1.52)	69.776 (1.52)	20.675 (0.45)	538.529 (11.77)

Note: Figures in parentheses are per cent of the total reporting area.

earlier studies also (Kumar and Najibullah 2013; Sood 2022). Here, it must be noted that the land amenable to changes in hilly areas is very little, and any effort to do so comes at a huge financial cost with concomitant environmental implications.

The land scarcity problem is further compounded by the declining size of the land holdings due to fragmentation of these holdings as a consequence of ever ever-burgeoning population. A cursory look at the temporal composition of operational holdings in Himachal Pradesh during 1970-71 and 2015-16 shows that in 1970-71, 6.09 lakh farmers were cultivating 9.31 lakh hectares of land with an average size of holding at 1.53 hectares (Table 2). The number of total holdings in the state increased to 9.97 lakh with an average landholding size of 0.95 hectare by 2015-16. It can be observed from this table that the average size of holdings witnessed a decline of 35.3 per cent in the state during the past five decades. The extent of growing marginalisation of the holdings can be seen from the fact that 69.78 per cent of the farmers in the state are marginal, having less than 1.0 hectare of land, but cultivating only 28.63 per cent of the total land with a meagre average holding size of 0.41 hectare. The next largest category (18.17%) was small farmers having land ranging from 1.0 to 2.0 hectares but cultivating about one fourth (25.52%) of the cultivable land. This implied that about 87.95 per cent of the farmers (marginal and small) own just about 54.15 per cent of the land. Thus, the remaining 12 per cent of farmers account for 46 per cent of the total cultivable land. It could thus be construed that wide inequalities exist in the land distribution in the state, which have serious implications for the profitability of smallholder agriculture. And during the past five decades, about 3.88 lakh farmers have joined the ranks of the marginal class. Besides, due to a lack of land consolidation, the holdings are scattered, and many small-sized parcels are difficult to manage. Thus, these paltry holdings are rendered unviable for traditional crop farming. However, the more lucrative option of growing cash crops such as off-season vegetables, flowers and fruits has provided an edge to many farmers, especially in mid-hills, by augmenting their incomes in the state (Sharma and Kumar 2012; Kumar *et al.* 2017).

Shifts in Cropping Pattern

The cropping pattern in any region refers to the proportion of area under various crops at a particular point in time. It is influenced by agro-climatic, socio-economic, institutional, and political factors. As such, it is a dynamic concept because the cropping pattern evolves temporally and spatially and is an integral part of the agricultural development of the region. The shifts in area under major crops have witnessed tremendous change in Himachal Pradesh during the last five decades (Table 3). It can be seen from the table that the percentage share of rice, 'other cereals', pulses and foodgrains in total cropped area came down by 3.19, 5.43, 5,53 and 13.85 percentage points, respectively. Similarly, the area under oilseeds also declined from 2.58 per cent to 1.49 per cent. An increase of 2.70 percentage points in vegetables and 10.46 percentage points in fruits has been the hallmark of crop diversification in the state. As regards maize, its share increased by 1.12 percentage points to 29.28

Table 2. Marginalisation of operational holdings in Himachal Pradesh, 1970-71 to 2015-16

Size Category	1970-71			1990-91			2015-16		
	Number ('000)	Area ('000 ha)	Holding size (ha)	Number ('000)	Area ('000 ha)	Holding size (ha)	Number ('000)	Area ('000 ha)	Holding size (ha)
Marginal Farmers (Below 1.0 ha)	355.6 (58.21)	135.5 (14.56)	0.38	532.1 (63.80)	214.7 (21.30)	0.40	712.2 (71.45)	285.4 (30.23)	0.40
Small Farmers (1.0-2.0 ha)	123.4 (20.25)	176.5 (18.96)	1.43	166.4 (20.00)	235.1 (23.30)	1.41	173.5 (17.40)	242.3 (25.96)	1.40
Semi-Medium Farmers (2.0-4.0 ha)	86.3 (14.17)	238.9 25.66	2.77	93.9 (11.30)	257.6 (25.50)	2.74	82.3 (8.25)	223.3 (23.65)	2.71
Medium Farmers (4.0-10.0 ha)	38.2 (6.27)	220.7 23.71	5.78	35.8 (4.30)	205.2 (20.30)	5.73	25.9 (2.60)	141.2 (15.48)	5.45
Large Farmers (10.0 ha and above)	6.7 (1.10)	159.3 (17.11)	23.67	5.5 (0.60)	97.1 (9.60)	17.58	3.0 (0.30)	47.0 (4.97)	15.67
Total	609.1 (100.0)	930.9 (100.0)	1.53	833.8 (100.0)	1009.8 (100.0)	1.21	996.8 (100.0)	944.2 (100.0)	0.95

Note: Figures in parentheses are percentages of respective column totals.
Source: Statistical Outline of Himachal Pradesh (various issues), Department of Economics & Statistics, Shimla-9, Government of Himachal Pradesh.

Table 3. Changes in cropping pattern in HP, 1972-73 to 2019-20 (% of total cropped area)

Crops/Crop Groups	1972-73	1992-93	2010-11	2019-20
Rice	10.54	8.42	7.16	7.35
Maize	28.16	31.90	31.63	29.28
Wheat	34.27	38.90	38.11	36.02
Barley	4.55	2.79	2.39	1.98
Other cereals	5.91	2.08	1.94	0.48
Pulses	7.76	4.22	3.65	2.23
Total foodgrains	91.19	88.32	84.88	77.34
Fruits	1.79	4.78	8.03	12.25
Vegetables	2.11	2.61	3.20	4.81
Oilseeds	2.58	2.35	1.68	1.49
Others	2.34	1.94	2.52	3.05

Source: Computed from the data from the Annual Season and Crop Report (Various Issues), Directorate of Land Records, Government of Himachal Pradesh, Shimla.

per cent in 2019-20, while that of wheat increased by 1.75 percentage points to 36.02 per cent. Thus, it could be concluded that the cropping pattern has shifted in favour of horticultural crops (apple, other fruits and other vegetables) and major cereals (maize and wheat) in the state during the study period. Here, it is important to note that in addition to markets outside the state, the growing population in urban areas such as Shimla, Solan, Kullu, *etc*., have provided local markets for these perishable commodities. It is a positive externality of growing urbanisation for the farmers, as has been indicated by many studies (Rao *et al.* 2006, Rao and Joshi 2009, Kumar 2024).

Trends in Area, Production and Yields

Agricultural production can be increased either by bringing more area under cultivation or by enhancing productivity. The expansion of area through land improvements is generally a very costly proposition in the mountains. Also, with the growing population, the preference of the people to settle near the roads or near/around the towns has resulted in diverting the best crop fields into concrete structures (Kumar 2011). Hence, more pressure is on increasing production through the agricultural productivity route. The trends in area, production, and yields for various crops for the period TE 1974-75 to 2019-20 are given in Table 4. As is evident from the table, there has been a decline in the area of rice, wheat, barley, pulses and oilseeds of the order of 25.03, 2.46, 51.98, 67.48 and 55.95 per

Table 4. Per cent change in area ('000 ha), production ('000 tonnes) and yield (tonnes/ha) of crops in HP, TE 1974-75 to TE 2019-20

Crop	Area, production and yield	1974-75	1989-90	2004-05	2019-20	Per cent change in 2019-20 over 1974-75 (%)
Rice	A	96.06	91.21	81.38	72.01	-25.03
	P	101.68	86.83	105.14	124.49	22.44
	Y	1.06	0.95	1.29	1.73	63.32
Maize	A	261.98	309.58	296.37	285.01	8.79
	P	452.26	522.42	616.40	722.26	59.70
	Y	1.73	1.69	2.08	2.53	46.79
Wheat	A	315.74	373.04	363.43	307.96	-2.46
	P	330.23	469.62	559.98	564.60	70.97
	Y	1.05	1.26	1.54	1.83	75.29
Barley	A	41.59	35.01	24.04	19.97	-51.98
	P	48.78	35.01	30.82	33.57	-31.18
	Y	1.17	1.00	1.28	1.68	43.32
Pulses	A	69.88	42.78	26.69	22.72	-67.48
	P	27.78	8.09	9.14	38.35	38.06
	Y	0.40	0.19	0.34	1.69	324.56
Potato	A	14.92	15.70	14.82	15.13	1.42
	P	57.91	115.96	154.76	194.06	235.13
	Y	3.88	7.38	10.44	12.83	230.43
Oilseeds	A	23.10	21.60	17.57	10.17	-55.95
	P	9.70	5.26	8.60	6.10	-37.07
	Y	0.42	0.24	0.49	0.60	42.88

Source: Computed from the data from the Annual Season and Crop Report (Various Issues), Directorate of Land Records, Government of Himachal Pradesh, Shimla.

cent, respectively. During this period, the area under maize and potato increased by 8.97 and 1.42 per cent, respectively. The yield of crops like rice, maize and wheat in 2019-20 increased to 1.73, 2.53 and 1.83 tonnes per hectare compared to 1.06, 1.73 and 1.05 tonnes per hectare during 1974-75. From these statistics, it is amply evident that despite area decline in rice, oilseeds and barley, the production of these crops increased owing to an increase in yields. It is the cumulative result of the pro-active policy initiatives of the government, both state and the centre, hard-working peasantry, duly supported by advancements in technology.

Cropping Intensity

In a scenario of dwindling land resources, crop intensification is one of the tools to augment this scarce resource so as to produce more output per unit of area and time. The cropping intensity in Himachal Pradesh during 1972-73 to 2019-20 has been portrayed in Table 5. It can be seen that cropping intensity in the state increased from 166.36 per cent in 1972-73 to 176.69 per cent in 2007-08, which showed an increase of about 10 percentage points during this period. But cropping intensity declined to 168.15 per cent in 2019-20. Not much change in cropping intensity is indicative of a two-crop season prevailing in the state, but a decline in the same during the recent past decade is a cause of concern for the agriculture sector.

Urbanisation Trends

Himachal Pradesh has the highest percentage of rural population to total population among all the states and union territories of the country. Total population increased from 34.60 lakh in 1971 to 68.65 lakh in 2011

Table 5. Cropping intensity in Himachal Pradesh, 1972-73 to 2019-20

Year	Cropping intensity (%)
1972-73	166.36
1990-91	168.77
2007-08	176.69
2019-20	168.15

Source: Statistical Outline of Himachal Pradesh (various issues), Department of Economics and Statistics, Shimla-9, Government of Himachal Pradesh.

Table 6. Rural-urban population of Himachal Pradesh, 1971-2011

Year	Total population in lakh			Per cent of total population		Urban-rural ratio
	Total	Rural	Urban	Rural	Urban	
1971	34.60	32.18	2.42	93.01	6.99	7.52
1981	42.38	39.1	3.27	92.39	7.61	8.24
1991	51.71	47.22	4.49	91.32	8.68	9.51
2001	60.78	54.82	5.95	90.19	9.81	10.88
2011	68.65	61.76	6.89	89.96	10.04	11.16

Source: Statistical Outline of Himachal Pradesh (different issues).

(Table 6). The urban population has increased from 6.99 per cent in 1971 to 10.04 per cent in 2011 in the state. The basic cause for this shift from rural to urban areas is not the common concept of urbanisation, but the declaration of earlier rural areas as urban areas. This, however, is depicted as a small contribution to the rural-urban migration in this increase (Sharma *et al.* 2018). Slow urban growth of Himachal Pradesh is mainly because of its agricultural economy, inaccessibility, presence of a large number of small villages, sparse population distribution, tough terrain, lack of industrialisation, *etc*. (Chand 2013).

Pace of Urbanisation

Urbanisation in Himachal Pradesh has been relatively slow compared to other states. It can be inferred from Table 7 that the decadal growth in urbanisation declined from 34.76 per cent during 1971-81 to 15.61 per cent in 2001-11. During 2001-2011, Kullu district registered the highest growth of urban population of 37.54 per cent, followed by Shimla (20.40%) and Sirmaur (19.92%). Mandi district registered a low

Table 7. District-wise decadal growth rate of urban population (per cent)

Districts/State	1971-1981	1981-1991	1991-2001	2001-2011
Bilaspur	21.96	44.47	31.17	14.48
Chamba	13.00	40.36	15.57	4.53
Hamirpur	331.38	43.26	33.15	4.05
Kangra	41.27	21.27	21.80	19.36
Kinnaur	-	-	-	-
Kullu	57.32	24.15	43.22	37.54
Lahaul and Spiti	-	-	-	-
Mandi	-1.97	18.01	9.35	2.71
Shimla	30.85	57.32	32.59	20.40
Sirmaur	29.53	41.89	25.20	19.92
Solan	36.24	44.93	92.89	12.01
Una	137.05	31.69	22.16	13.92
H.P.	34.76	37.80	32.59	15.61

Source: Statistical Outline of Himachal Pradesh (different issues).

growth of 2.71 per cent during 2001-2011. Here, it is important to note that this pace of urbanisation, mostly in these district (headquarters) towns, normally overlooks the growth of population around these towns or urban sprawls.

Class-Wise Distribution of Urban Population

The urban population of the state was 7.88 lakh according to the 2011 census, but it is fast increasing. The Class-wise distribution of the urban population has been presented in Table 8. Out of the total 59 towns, 29 were Class VI towns, and 15 were Class V towns. It can be seen from the table that there was a complete absence of Class-II towns in Himachal Pradesh during the 2011 census. In 2011, there was only one Class I town (Shimla) comprising 24.63 per cent of the total urban population of the state, which was the result of administrative exigencies and industrial settlement. Since there was no Class II town in 2011, the city of Shimla, along with Class III towns, had been accommodating more than 50 per cent of the urban population of the state. And during the last couple of years, the state government has redefined many urban local bodies. The state currently has 74 Municipalities (Urban Local Bodies), including 8 Municipal Corporations, 29 Municipal Councils and 37 Nagar Panchayats, which cover 9.16 lakh urban

Table 8. Class-wise distribution of urban population in HP, 2011

Size class	Population range	No. of towns	Total population	% to total population
All Classes	-	59	688552	100
Class I	Above 100000	1	169578	24.63
Class II	50000-99999	-	-	-
Class III	20000-49999	7	204779	29.74
Class IV	10000-19999	7	111185	16.15
Class V	5000-9999	15	115659	16.80
Class VI	Below 5000	29	87351	12.69

Source: Statistical Outline of Himachal Pradesh, 2016-17.

population (as per 2011 census report), and it is about 13.34 per cent of the total population of the State.

In November 2024, the state government approved the formation of three new municipal corporations in Hamirpur, Una and Baddi, taking the total number in the state to eight. Up to 2015, Shimla was the only Municipal corporation in the state, and then Dharamshala was made the second Municipal corporation. Later on, in 2020, Palampur, Mandi and Solan were declared as Municipal corporations. This rapid redefining of seven Committees as Corporations in less than a decade reflects the growth of sprawls and hence the need for urbanisation. This certainly has associated implications for urban development in Himachal Pradesh as well as for the agriculture sector.

Extent of Land Use Changes

The extent of land use changes was captured within a radius of about 15 km for the three selected towns, namely, Solan, Kullu and Hamirpur, which are district headquarters also, and have seen heavy expansion of peri-urban area. These towns of Solan, Kullu and Hamirpur have their typical features such as agroclimatic conditions, topography, and infrastructure built up. Solan town is an important market gateway for many commercial crops that are produced not only in this district but also in adjoining districts. Also, it has evolved as an important educational hub over time as many Universities have been set up in its peripheral area. The growth of peri-urban areas in and around Kullu town is attributed to cash crop farming and tourism activities. The year-round connectivity to the Lahaul valley and beyond after the construction of the Rohtang Atal Tunnel in 2020 has further fuelled these activities. Contrarily, Hamirpur town, besides being a district headquarters, is home to many public and private institutions, such as NIT, and a medical college, which make it an educational centre for people from adjoining districts also.

The results have been depicted in Figures 1-3, and the following observations are in order. There has been a clear-cut indication that the built-up area has gone up from 13 per cent in 2018 to 20 per cent in 2023 in Solan town and its outskirts, registering a seven percentage points increase in the last five years. Most of this increase appears to have come from barren areas/grasslands/pastures. Also, the area under trees has gone up by 7 percentage points from 44 per cent to 51 per cent during the study period. The area under crops, mainly cash crops grown in the vicinity of the town, such as tomato, capsicum, beans, *etc*., appears to remain unchanged at around 2 per cent during this period.

In the case of Kullu and its suburbs, the built-up area has gone up from 7 per cent in 2018 to 9 per cent in 2023, registering a two percentage points increase in the last five years. Most of this increase appears to have come from barren areas/grasslands/pastures, the

Table 9. Salient demographic details of the selected towns, 2011

District town/ urban local body	Total geographical area (sq km)	Population (number)			Population density (per sq. km)	Decadal increase: 2001-2011 (%)
		Male	Female	Total		
Solan (MC)*	6.18	21182	18074	39256	6352	14.76
Kullu (MC)	6.68	9608	8928	18536	2775	1.26
Hamirpur (MC)*	5.24	9056	8548	17604	3360	2.04

Note: * Both these towns have now been upgraded as Municipal Corporations in 2020 and 2024, respectively.
Source: Urban Statistics (2015), Directorate of Economics and Statistics, Government of Himachal Pradesh, Shimla.

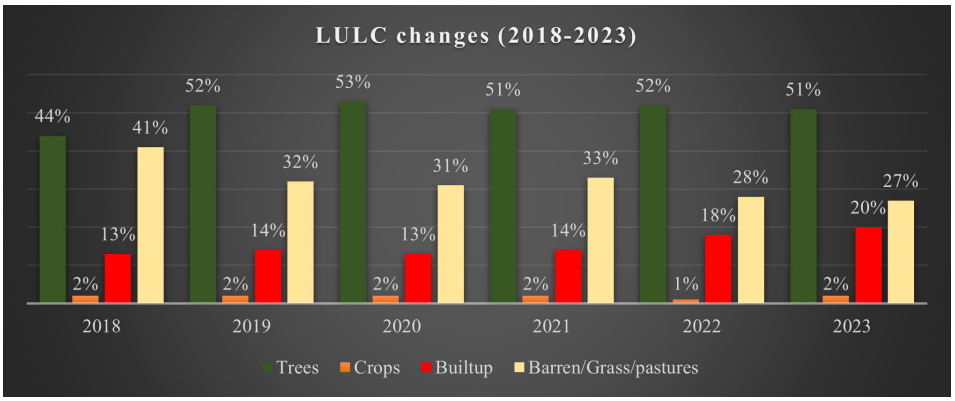


Figure 1. Land use changes in Solan town, 2018-2023.

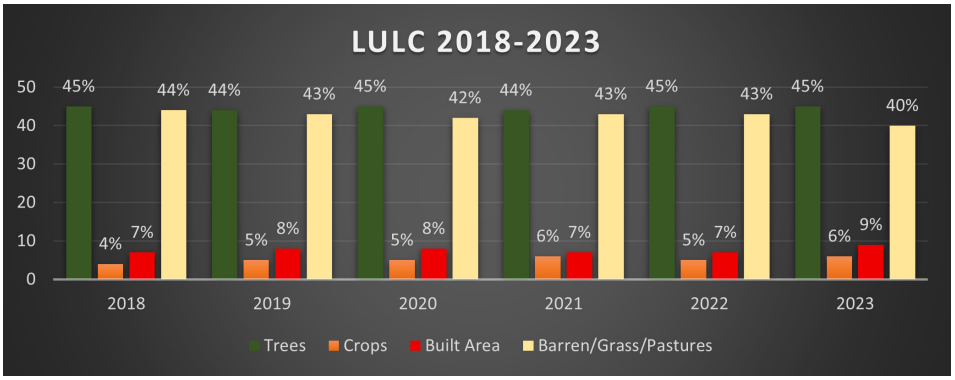


Figure 2. Land use changes in Kullu town, 2018-2023.

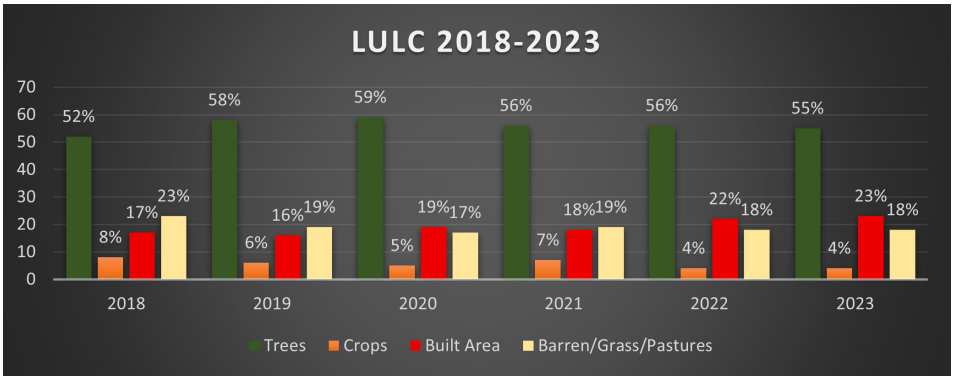


Figure 3. Land use changes in Hamirpur town, 2018-2023.

area under which has come down by 4 percentage points from 44 per cent to 40 per cent during the study period. The area under crops, mainly cash crops grown in the vicinity of the town, such as cauliflower, cabbage, beans, *etc,* have gone up by 2 percentage points in the last five years.

In the case of Hamirpur and its peri-urban areas, the built-up area has gone up from 17.2 per cent in 2018 to 23.42 per cent in 2023, registering a huge 6.0 percentage points increase in the last five years. Most of this increase appears to have come from barren areas/ grasslands/pastures, which witnessed a fall of area from 23 per cent in 2018 to 17.73 per cent in 2023. Partially, it might have come from the area under crops, which has come down from 7.68 per cent to 4.16 per cent during the study period. On the other hand, the area under

miscellaneous trees has gone up by 2.5 percentage points from 52.11 per cent to 54.69 per cent during the study period.

Evidently, these findings clearly bring out that the built-up area in these towns and their sprawls increased from 2.0 per cent in Kullu to 7.0 per cent in Solan, and most of it came from barren land /pastures, *etc*. The area under crops (which also includes intercropping with horticultural crops, especially in Kullu and Solan areas) has remained more or less unchanged in these two areas. However, in the case of Hamirpur and its subburbs, which have a relatively flat topography and people mainly grow foodgrains such as maize and wheat, in addition to some progressive farmers undertaking vegetable cultivation, there has been a decline of over 4.0 per cent in area under crops. The area under trees has also increased in Hamirpur town. The decline in crop land and the increase in area under tree crops, as revealed during the field survey, are attributed to twin factors of very high wild and stray animal menace in this area, along with the non-use of fuel wood (due to LPG availability).

Interplay of Agriculture and Urbanisation

The interplay of agriculture and urbanisation is different in mountainous areas *vis-à-vis* plain regions, mainly due to uneven topography and patterns of unplanned human settlements. Of late, it is common knowledge that there has been a lot of construction and infrastructure development both within (official) urban areas as well as peri-urban areas. It is more true for the hilly regions like Himachal Pradesh. There has been a decline in land under plough in the state, and the area put to non-agricultural uses has registered very high growth rates, post-1990s (Kumar 2011, Sood 2022 and Kumar 2024). Given that most of the towns/cities in the mountainous regions of India have evolved as centres and/or units of administration, defence, tourism and pilgrimage (Wanti 2023), the development of smart cities across the country and the recent efforts to generate revenue through tourism/eco-tourism by the resource-starved state governments, have put additional stress on urban-rural planning in these areas. It has both positive and negative externalities for the poor peasantry in these regions. The gentrification of these suburban inhabitants due to the growing population has implications for their socio-cultural and livelihood security.

Besides the impact on agriculture, unplanned urbanisation has influenced the land surface temperature, which led to the Urban Heat Island (UHI) phenomenon, thus negatively impacting the quality of life in and around that area (Mehta *et al.* 2023). Also, there is rapid environmental degradation due to uncontrolled urbanisation. Ecological Footprint (EF) analysis of built-up land footprint in Solan district of Himachal Pradesh revealed that the EF built-up exceeds its biocapacity, resulting in an ecological deficit, which in turn leads to an unsustainable system (Pandit *et al.* 2021). The land-slides and flood-caused devastation near river-bed settlements have become rampant in the last couple of years in the state during the rainy season, which has resulted in huge economic losses to the people in the state.

The land prices in these 'urban sprawls' decline as one moves away from urban centres (Chadha *et al.* 2004). There is huge underreporting of the actual land prices in these markets, for fear of taxing registration fees, and the gap between the price actually paid and the one registered in sale deeds also widens over time (Marothia *et al.* 1991). Highly distorted land prices are attributed, among other things, to regulatory constraints and the process of compulsory acquisition. This has necessitated the reforming of the land acquisition framework in India (Pandey and Morris 2007). At times, the small farmers sell land to meet their household and social needs in the urban fringes. Contrarily, the large farmers do so due to the shortage of labour and irrigation water (Bhandari 2007). Also, it has been found that large and medium farmers undertook the construction of shops/commercial units on the main road-head to make use of the impending opportunities due to urban sprawling (Kumar *et al.* 2009).

Urbanisation is a robust demand side determinant of diversification of agriculture towards high value commodities such as vegetables, fruits, milk and flowers, which, being perishable and at the same time more remunerative, suit better in areas closer to urban demand centres than hinterlands (Rao *et al.* 2006, Rao and Joshi 2009). In the context of Himachal Pradesh, high growth in urban and peri-urban areas of cities and towns like Shimla, Solan, Kullu, Dharamshala, Hamirpur, *etc*., has given a ready market for the cash crops, especially vegetables and fruits, and also milk

and milk products being produced in the surrounding areas. As regards the impact of urbanisation on costs of production, some studies suggest that urban proximity raises the cost of farm production and decreases the viability of traditional farms in urban-influenced areas. The farmers in urban-influenced locations were less technically efficient than farmers in rural locations in the region examined (Nehring *et al.* 2018). These urbanisation processes put pressure on farmers, making farming activities harder through reduced agricultural land, negative externalities and the competition for land (Veronique *et al.* 2020).

Of late, given that the scope of air travel and railways is highly limited in mountainous regions like Himachal Pradesh, the expansion of the national highway network through four-laning has its own ecological and economic costs for the people of these areas. While the ecological devastation witnessed year after year in the last couple of years in the state has attracted national attention, the field surveys indicate that the land market has become highly coercive and volatile in and around these infrastructure project areas, jeopardising the livelihood security of marginal land holders who have little say in these markets. The pressure on agricultural land is clearly visible, as the low profitability of small and marginal farms at times has been forcing people out of farming. The economic losses due to wild (monkeys, *etc*.) and stray animal menace in some areas have further fuelled this trend (Thakur *et al.* 2022).

CONCLUSIONS

Given the ever-growing population, it is amply evident that the urban population, both in officially defined as well as in peri-town areas, is likely to witness even higher growth in the coming times. The redefining/ reclassifying of urban local bodies, both due to urgency as well as due to politico-economic considerations, is going to change the adjoining rural landscape. Here, it is worth observing that the statistics on urban development, land use planning and agriculture are not being regularly updated. Besides, the barren/ unculturable land on hill slopes is amenable to easy transfer to a built-up area, notwithstanding the high costs involved. This is leading to an ecological catastrophe as well as economic and human misery, as is being witnessed over the past decade or so. It calls for prudent and sensible development planning of these urban and peri-urban areas. Both the positive and negative externalities of this development paradigm need to be weighed from the sustainability and long-run perspective. Given that agricultural land is already scarce in mountainous areas like Himachal Pradesh, and productivity hikes are not easily realisable in these regions as in plain topographies, it is going to put extra pressure on the cultivated area around towns. Hence, a proper land use planning and agriculture policy framework is needed to balance the rural-urban interaction for the overall development of the state.

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