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## Structural shift in the consumption pattern of agricultural commodities in Himachal Pradesh

**Jyoti Chaudhary and HP Singh**

**Abstract**

The present study analysed the change in the consumption pattern of agricultural commodities in Himachal Pradesh using the consumption expenditure survey of the National Sample Survey Organization (NSSO) for 43<sup>rd</sup>, 50<sup>th</sup>, 61<sup>st</sup>, and 68<sup>th</sup> rounds across income groups and for rural and urban sectors. The results showed that the marked difference in the food expenditure pattern of rural and urban households, as they spend around 42 per cent and 36 per cent of their income on food respectively during 2011-12. The share of the foodgrains in total food expenditure has declined from 41% to 27% in rural areas and 29% to 25% in the urban areas during 43<sup>rd</sup> to 68<sup>th</sup> round. The cereals dominated the food expenditure followed by milk and milk products. The structural shift in the consumption pattern from the foodgrains to high-value commodities (HVC) like milk and milk products, fruits, vegetables, and non-vegetarian food (egg, fish, meat), etc. across income groups and in rural and urban sectors has been observed. Further, the increased in the diversification index of dietary intake from 0.777 (43<sup>rd</sup>) to 0.821 (68<sup>th</sup>) revealed the shift in dietary diversity in the state in both sectors. The boom in the consumption pattern in rural and urban Himachal Pradesh towards HVC was due to increased per capita income, agricultural diversification, urbanization, change in taste and preferences, economic growth, etc. The shift in consumption pattern towards the HVC led to the decline in the consumption of the foodgrains which is a concern for the food security of the state.

**Keywords:** Structural shift, high-value commodities, diversification, food expenditure

**Introduction**

Over the past few decades, the Indian economy has made impressive progress. With the growth in the economy, rapid urbanization, rising per capita income, changing lifestyles, availability of variety in the food basket, and change in taste and preferences have shifted the consumption of the food commodities from traditional food towards the high-value commodities like milk, milk products, fruits, vegetables and non-vegetarian food (egg, fish, meat). Several studies revealed the increased diversification and changing consumption pattern towards high-value commodities across India (Kumar and Mathur, 1996; Mittal, 2006; Srivastava *et al.*, 2013; Arun *et al.* 2017) [10, 11, 12, 18, 2]. The change in the dietary pattern is mainly due to the shift from traditional cereal based consumption towards high-value crops. This shift has been made both in demand and supply of these commodities.

The share of the agricultural and allied sector has gradually declined from 51.81 percent (1950-51) to 16.5 percent (2019-20) reflecting the development process and structural shift in the economy (Economic Survey, 2019-20). Despite the sluggish growth of the agricultural sectors, its importance in the Indian economy remains important however, it has created a disparity in the income distribution which led to the variations in the consumption pattern of rural and urban households in the country as well as the states.

Among all the hill states and regions of India, Himachal Pradesh is observed to be the most progressive state over the years which has made remarkable achievements in the socio-economic development of its households and transformation of hill economy through the development of agriculture, horticulture including animal husbandry. The net per capita income of the state was Rs. 1,83,108 during 2018-19, percent higher than the Indian average. Two-third of the population in the state depends mainly on agriculture for their livelihood and employ 62 percent population indicating a massive dependence on this sector. The structural composition of the state economy witnesses significant transformation over the decade. The economy has shifted from agriculture to the industrial and service sector. The change in the cropping pattern of the agricultural commodities from cereal-based subsistence farming to high-value crops (Thakur *et al.*, 2014) [19] has resulted in the shift of the consumption pattern of the households of the state. The cultivation of the high-value crops in some of the niches of the state led to an increase in the income of the rural sector in the specific areas which led to the improved standard of living of the people.

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Also, the urban population of the state has increased by 347 percent from 1951 to 2011 which is one of the factors considered for the shift in the dietary pattern of the population in Himachal Pradesh. With this background, the present study is conducted to study the shift in the consumption pattern of this hilly state and disparity among rural and urban sectors and across the different income groups.

### Data and Methodology

In this study, the changes in the food consumption were analyzed using secondary data on monthly per capita consumption (MPCE) of different food commodity collected from the consumer expenditure survey reports of the National Sample Survey Organisation (NSSO) relating to 43<sup>rd</sup>, 50<sup>th</sup>, 61<sup>th</sup> and 68<sup>th</sup> round for Himachal Pradesh. This state is purposively selected to study the changing consumption pattern of the households due to the diversification of agriculture towards high-value crops. The data pertain to the mean per-capita consumption of all food commodities in the sample household. The quantity consumed and expenditure on individual commodities were aggregated into food groups (cereals, pulses, edible oils, milk and milk products (MMP), egg, fish, meat (EFM), vegetables, fruits) and consumption pattern in terms of per capita consumption and budget share were analyzed. The study was carried out for households belonging to the different income groups and rural and urban sectors. The per-capita expenditure (MPCE) was used as the proxy for per-capita income, as the data on the per capita income is rarely available. For the analysis the four income groups were formed for both rural and urban households based on the poverty line adopted by the Planning Commission, Government of India (Kumar, 1998; Kumar *et al.*, 2009; Mittal, 2010) [8, 9, 13]. The households were categorized into the four income groups, very poor with the consumption expenditure of less than 75 percent of the poverty line, poor with consumption expenditure below poverty line up to 75 percent of the poverty line, middle class with consumption expenditure ranging between poverty line up to 150 percent of the poverty line, while the rich with the consumption expenditure of more than 150 percent of the poverty line

### Measure of Dietary diversity

The Simpson Index of Diversity (SID) was used to measure the diversity in food consumption of the households. The index took into consideration all food commodities except beverages and processed food. The index was put forward by Edward Simpson in 1949 [17] for the measurement of species diversity (Simpson, 1949) [17]. Further, for use in economic studies, it was modified by Orris C. Herfindahl in 1950 [5]. The studies on dietary diversity were conducted by Katanoda *et al.* 2006; Thiele and Weiss, 2003; Shinoj *et al.* 2015; Joshi *et al.* 2016 [7, 6]. Thus, dietary diversity is computed as:

$$SID = 1 - \sum_{i=1}^n P_i^2$$

Where, SID= Simpson Index of diversity,  $P_i$ = proportion of the  $i^{\text{th}}$  food item in total monthly consumption food items by members of the household.

### Results and Discussion

#### Income group-wise consumption expenditure in Himachal Pradesh

The analysis of the consumption pattern of the food products across income levels in rural and urban sectors in Himachal Pradesh showed that monthly per capita expenditure and food expenditure varied between sectors and across income groups as depicted in Table 1. The average monthly per capita total expenditure (income) was Rs. 1858 for the rural households and Rs. 3135 for urban households. The food expenditure was found inversely related to the income of the households. The very poor spend nearly 62 percent of their income on food as compared to the rich household who spends only 41 percent of their income on food commodities. This trend was prevalent both in rural and urban sectors of Himachal Pradesh during 2011-12. As the rural poor spent 63 percent of their income on food and the urban poor spent 54 percent, and food expenditure declined to 38 percent for rural rich and 35 percent for urban rich households. In food expenditure with improvement in Income, a decline is expected and it is consistent with Engle's Law. Further, the share of food expenditure in rural Himachal Pradesh was comparatively higher which signifies the poverty in the region compared to the urban households.

**Table 1:** Income group-wise household expenditure in Himachal Pradesh during 2011-12

Income group	MPCE			Food Expenditure			RUD (%)	
	Rural	Urban	HP	Rural	Urban	HP	MPCE	Food Expenditure
V. Poor	632.82	710.06	639.97	395.92 (62.56)	383.15 (53.96)	394.74 (61.68)	12.21	-3.22
Poor	810.77	921.35	814.15	478.15 (58.98)	513.00 (55.68)	479.22 (58.86)	13.64	7.29
Middle	1142.43	1220.71	1145.41	631.15 (55.25)	582.20 (47.69)	629.29 (54.94)	6.85	-7.76
Rich	2542.16	3501.87	2694.07	955.25 (37.58)	1240.55 (35.43)	1000.41 (37.13)	37.75	29.87
All	1858.52	3134.90	1996.67	785.60 (42.27)	1134.11 (36.18)	823.32 (41.23)	68.68	44.36

**Note:** RUD (%): Rural-urban difference) (Urban-Rural)/Rural\*100)

The Figures in parenthesis are the share of food expenditure in total consumption expenditure

Source: Author's calculation from 68<sup>th</sup> round of NSSO

**Table 2:** Household Budget *al.* location to food across different expenditure classes and Years (per cent)

Income group	1987-88	1993-94	2004-05	2011-12	% change (1987-88 to 2011-12)
V. Poor	69.24	71.11	65.04	61.68	-10.92
Poor	65.49	70.22	64.25	58.86	-10.12
Middle	60.27	68.20	61.99	54.94	-8.84
Rich	47.75	49.22	44.74	37.13	-22.24
All	59.70	57.13	48.66	41.23	-30.94

**Source:** Author's calculation from various rounds of NSSO

The share of food in the total monthly expenditure of a household in Himachal Pradesh has declined over the years as presented in Table 2. The share of the food has declined from 60 percent during 1987-88 to 41 percent during 2011-12. Across the income groups with increased income, the expenditure share on food was reduced (Engel's law). During 1987-88 very poor households spent 69 percent of their income and rich household spends only 48 percent of income on food, which declined to 62 percent for very poor and 37 percent for rich households (2011-12). The major decline in

the food expenditure among expenditure groups has been observed for the rich households since improved income had shifted the expenditure pattern from food to non-food commodities. During 1987-88 to 2011-12, the food budget had marked decline by more than 31 percent, points to the increase in the income of the households.

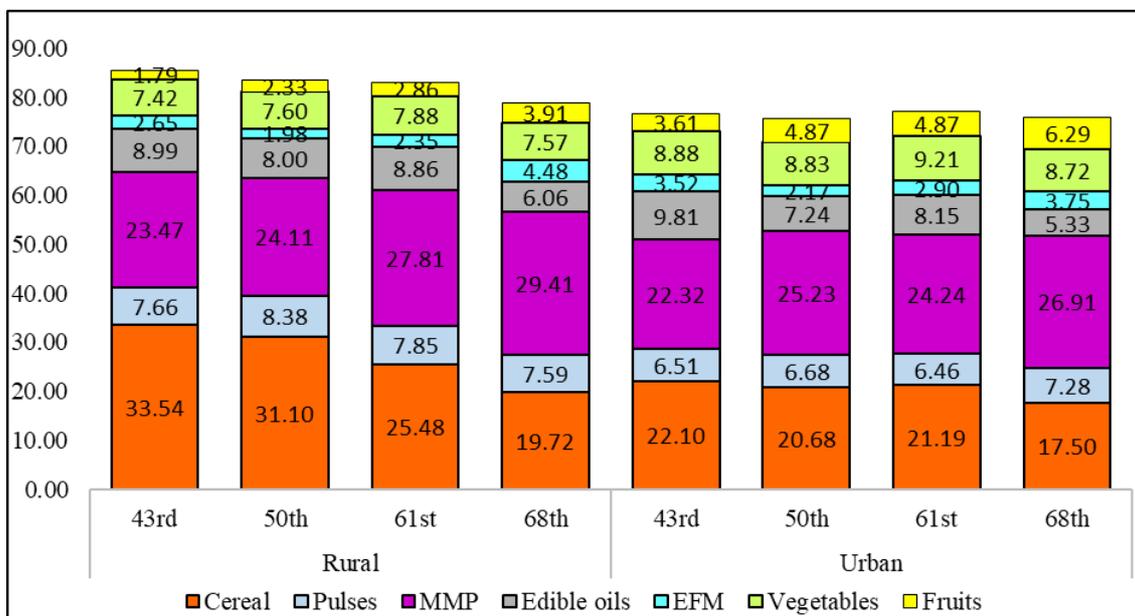
**Table 3:** Income group and sector-wise share of food commodities in the consumption pattern of Himachal Pradesh in 2011-12 (share in percent)

Income Group	Cereals	Pulses	MMP	Edible oils	EFM	Vegetables	Fruits
<b>Rural</b>							
V. Poor	29.99	9.85	17.94	7.53	0.13	6.50	0.68
Poor	28.29	8.36	20.43	7.52	2.64	7.23	2.02
Middle	22.07	7.98	27.12	6.69	4.47	7.62	2.81
Rich	17.75	7.32	31.42	5.64	4.75	7.61	4.58
Total	19.72	7.59	29.41	6.06	4.48	7.57	3.91
<b>Urban</b>							
V. Poor	34.98	11.64	14.13	7.92	2.93	9.70	1.34
Poor	22.95	9.97	24.07	7.11	2.05	10.10	2.89
Middle	21.75	8.57	29.18	6.74	1.98	9.22	3.15
Rich	17.05	7.14	26.92	5.21	3.88	8.67	6.55
Total	17.50	7.28	26.91	5.33	3.75	8.72	6.29
<b>HP</b>							
V. Poor	30.44	10.01	17.60	7.57	0.38	6.79	0.74
Poor	28.11	8.41	20.55	7.50	2.62	7.32	2.05
Middle	22.06	8.00	27.19	6.69	4.38	7.67	2.82
Rich	17.61	7.28	30.54	5.55	4.58	7.82	4.96
Total	19.39	7.54	29.04	5.95	4.37	7.75	4.26

Source: Author's calculation from 68<sup>th</sup> round of NSSO

Note: MMP- Milk and milk products, EFM- Egg, Fish, Meat  
Income is a vital factor that influences the consumption behaviour of households. With the improved income, the household expenditure on food commodities has decreased but it has diversified the food basket and this led to variation in the food basket of the low income and high-income households. Table 3 revealed lower-income rural households

spend around 40 percent on foodgrains and rich rural households only about 25 percent. The expenditure on milk, milk products, edible oils, non-vegetarian food (egg, fish, meat), vegetables, and fruits was increased across the income groups, which shows the shift in the consumption pattern from foodgrains to high-value commodities across the income groups. In urban sectors, the very poor households spent 47 percent on foodgrains and rich households comparatively less i.e., around 25 percent on foodgrains. The share of expenditure on the livestock products (milk, egg, fish, meat, etc.) was higher in the rural areas compared to the urban areas of the state as more than two-thirds of the population of the state resides in the rural areas and the availability of the livestock products is more in the rural areas. With the growth in the state economy, improved per capita income, urbanization, and variety in food commodities the variation exists in the consumption pattern of households across the expenditure classes. Table 3 further showed mixed trends of the share of the food groups in the total food commodities. The expenditure share on cereals and pulses was declined with the rise in income for both the rural and urban sectors. The high-value commodities like MMP, EFM, vegetables, and fruits the expenditure shares had increased with the increase in income. This shift in the expenditure share from essential food like cereal, pulses, edible oils towards HVC with an increased income validated Bennett's law of consumption (the consumption switches towards a more expensive diet with a rise in income) (Srivastava *et al.* 2013)<sup>[18]</sup>. Further in Himachal Pradesh, the food expenditure share on MMP was higher for high-income households in urban areas, and for EFM, vegetables, and fruits it was higher for the rural households. This is because state agriculture has diversified towards high-value commodities and the major portion of the state population resides in rural areas and had access to these food commodities easily.



**Fig 1:** Share of food expenditure on different food commodities in Himachal Pradesh.

Fig 1 in the state although the cereals continue to constitute the major part of households' food basket a notable decline in the proportion of its expenditure was witnessed in the past few decades, the decline was more in the rural areas compared to the urban areas i.e., from 33.54 percent to 19.72 percent from 1987-88 to 2011-12 in rural areas and 22.10 percent to 17.50 percent in urban areas. This might be due to

the availability of cereals at lower prices through PDS. Further, the share of expenditure on pulses showed a mixed trend in both sectors, i.e., declined in the rural sector (7.66% to 7.59%) and increased in the urban sector (6.51% to 7.28%). The composition of food basket has changed as the share of food grains declined and that of MMP, EFM, vegetables, and fruits have increased (Arun *et al.*, 2017)<sup>[2]</sup>. The increase in the

share of expenditure on MMP in total food expenditure is more in the rural area (23.47% to 29.41%) and comparatively lesser in urban areas (22.32% to 26.91%). In percent composition, only a marginal increase was found in vegetables from 43<sup>rd</sup> to 61<sup>st</sup> round in both rural and urban sectors which decline by a small percent during the 68<sup>th</sup> round. But the share of fruits in total food expenditure was increased by many folds. These products (HVC) provide nutritional security as they are rich in protein, vitamins, minerals, and other required micronutrients. Although the share of expenditure on cereals has declined their importance has been the same in the food remain basket the same. Trends in the quantity of food commodities consumption Table 4 and Fig 2 to Fig 10 presents the trends in the per capita consumption of food commodities and revealed that over more than two decades, there was a marginal increase in the monthly per capita consumption of rice from 4.07 kg to 4.48 kg for rural households and from 4.15 kg to 4.19 kg in urban households. Fig 2 depicts the increase in per capita rice consumption across income groups. The per capita consumption of wheat in rural areas has declined from 7.10 kg to 6.66 kg and 7.57

kg to 6.25 kg in urban areas. The per capita consumption of wheat was increased with an increase in income from low to high income during the study period (Fig 3). There has been a significant decline in per capita consumption of cereals, i.e., 15.54 kg in 1987-88 to 12.02 kg in 2011-12 in rural areas and 12.31 kg to 10.91 kg in urban areas (Fig 4). The reduction in the relative quantity of cereal consumption might be because of the change in the taste and preference of households from food to non-food items (Radhakrishna and Murthy, 1999, Radhakrishna 2005) [15]. The monthly per capita consumption of the pulses declined from 1.39 kg (1987-88) to 1.17 Kg (1993-94) and later increased to 1.20 Kg (2004-05) to 1.28 Kg (2011-12) in rural areas of the state. Similar trends were observed in the urban sector as the consumption declined from 1.60 Kg (1987-88) to 1.34 Kg (2004-05) but increased to 1.54 Kg (2011-12) but not more than 1987-88. Thus, the decline in the consumption of the foodgrains was more in the rural Himachal Pradesh compared to the urban due to the improvement of the rural infrastructure which made other food commodities available to the rural households.

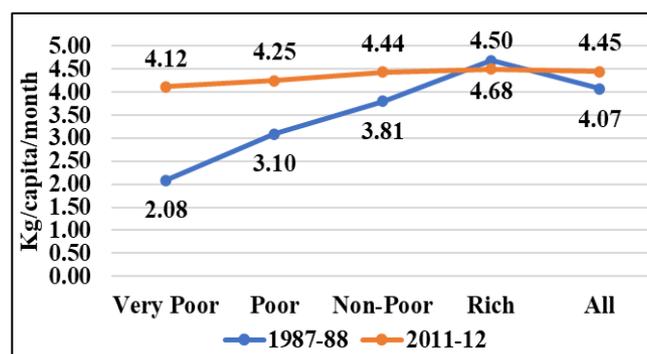
**Table 4:** Over the year's changes in the consumption of food commodities (kg/capita/month)

Year	Rural								
	Rice	Wheat	Cereal	Pulses	MMP	Edible oils	EFM	Vegetables	Fruits
1987-88	4.07	7.1	15.84	1.39	7.59	0.47	0.14	3.55	0.5
1993-94	3.64	6.27	13.37	1.17	7.8	0.45	0.11	3.57	0.5
2004-05	4.09	6.09	12.06	1.2	9.06	0.6	0.11	3.77	0.66
2011-12	4.48	6.66	12.02	1.28	9.88	0.72	0.22	3.67	0.61
%Change	10.07	-6.20	-24.12	-7.91	30.17	53.19	57.14	3.38	22.00
Urban									
1987-88	4.15	7.57	12.31	1.6	8.51	0.66	0.3	5.33	1.13
1993-94	3.77	6.85	11.01	1.34	9.41	0.6	0.19	5.21	1.24
2004-05	4.12	6.43	10.84	1.34	8.65	0.78	0.22	5.44	1.11
2011-12	4.19	6.25	10.91	1.54	9.45	0.82	0.31	5.17	1.19
%Change	0.96	-17.44	-11.37	-3.75	11.05	24.24	3.33	-3.00	5.31
Combine									
1987-88	4.07	7.13	15.61	1.4	7.65	0.48	0.15	3.67	0.54
1993-94	3.65	6.32	13.17	1.18	7.94	0.47	0.11	3.71	0.56
2004-05	4.09	6.12	11.94	1.21	9.02	0.62	0.12	3.92	0.7
2011-12	4.45	6.62	11.91	1.31	9.83	0.73	0.23	3.83	0.67
%Change	9.34	-7.15	-23.70	-6.43	28.50	52.08	53.33	4.36	24.07

Source: Author's calculation from various rounds of NSSO

The consumption of the milk and its products was increased considerably from 7.59 Kg per capita per month (pcpm) to 9.88 Kg pcpm from 1987-88 to 2011-12 in the rural area and from 8.51 Kg pcpm to 9.45 Kg pcpm in the urban area of the state. The increase in the consumption of these products was more in rural areas compared to the urban, because in rural areas of Himachal Pradesh almost every household possess cow/buffalo thus milk supply is sufficient. The consumption of non-vegetarian food (egg, fish, meat) has shown a rise in the per capita consumption from 0.14 Kg to 0.22 Kg during the study period in rural Himachal Pradesh. While the consumption of EFM in the urban area increased marginally by around 2 percent over the years. The per capita consumption of vegetables was more in the urban areas over the years compared to the rural areas, but a significant increase in the consumption was seen only in the rural areas i.e., from 3.55 Kg to 3.67 Kg. Fruits consumption was also high in the urban areas compared to the rural and the consumption has increased considerably from 0.50 Kg pcpm in 1987-88 to 0.61 Kg pcpm in 2011-12 in rural areas and it increased 6 percent by from 1.13 Kg pcpm to 1.19 Kg pcpm in 1987-88 to 2011-12 in urban areas. The decreased consumption of foodgrains and increased consumption of agricultural commodities was changing consumption pattern

both in rural and urban areas because of the rising incomes of households and increased preferences towards more nutritious foods. The difference in the consumption pattern of food commodities in rural and urban areas can be explained by the income and price effect. The more consumption of the cereal and less consumption of other food in rural areas was due to lower food prices in these areas. Hence, urban diets were relatively more diverse than rural due to higher non-farm incomes (Chopra 2015) [3].



**Fig 2:** Income group-wise monthly per capita consumption of rice (1987-88 to 2011-12)

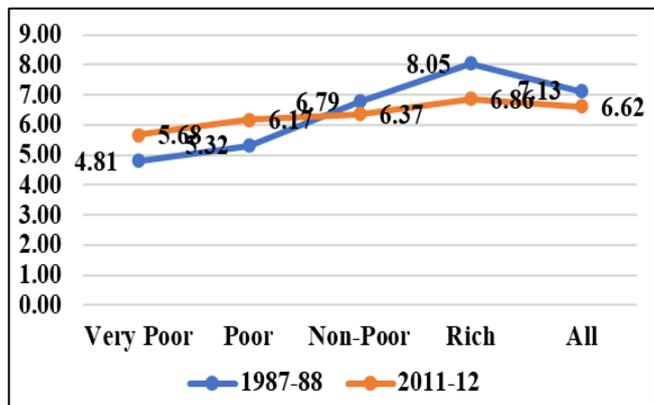


Fig 3: Income group-wise monthly per capita consumption of wheat (1987-88 to 2011-12)

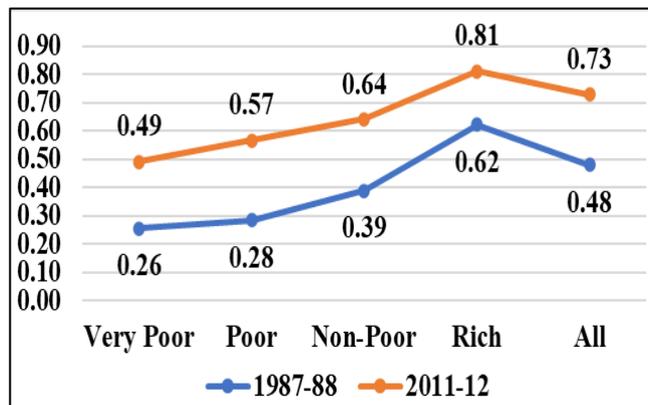


Fig 7: Income group-wise monthly per capita consumption of edible oils (1987-88 to 2011-12)

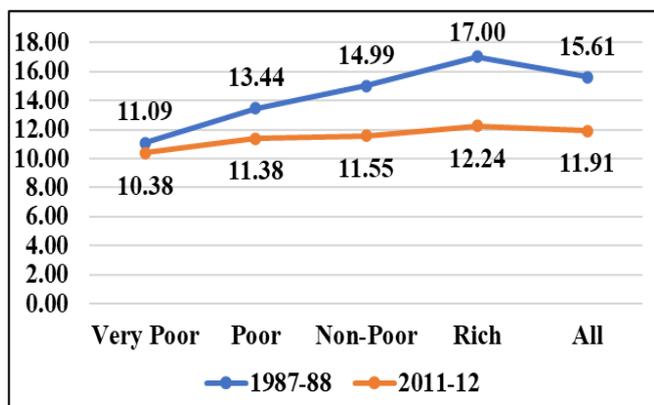


Fig 4: Income group-wise monthly per capita consumption of cereals (1987-88 to 2011-12)

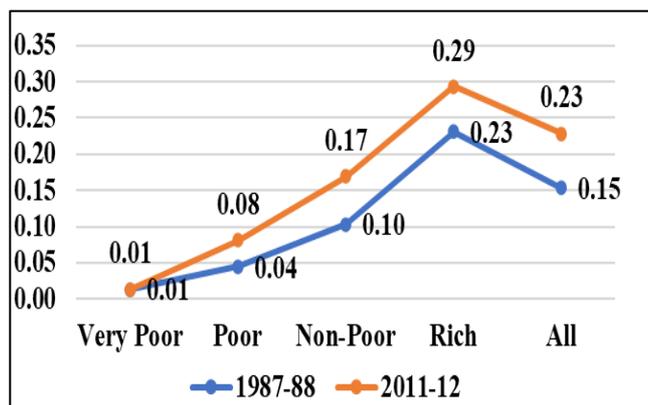


Fig 8: Income group-wise monthly per capita consumption of egg, fish & meat (1987-88 to 2011-12)

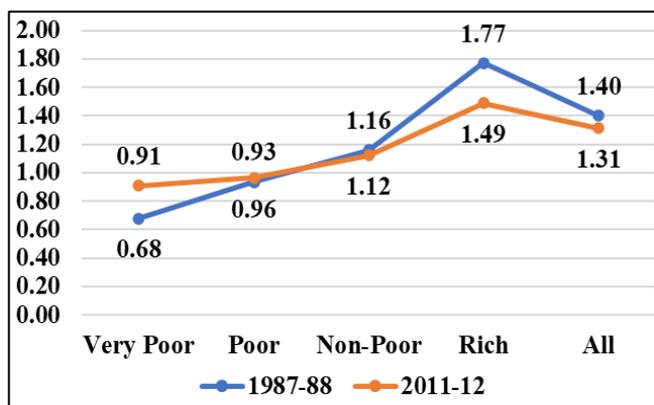


Fig 5: Income group-wise monthly per capita consumption of pulses (1987-88 to 2011-12)

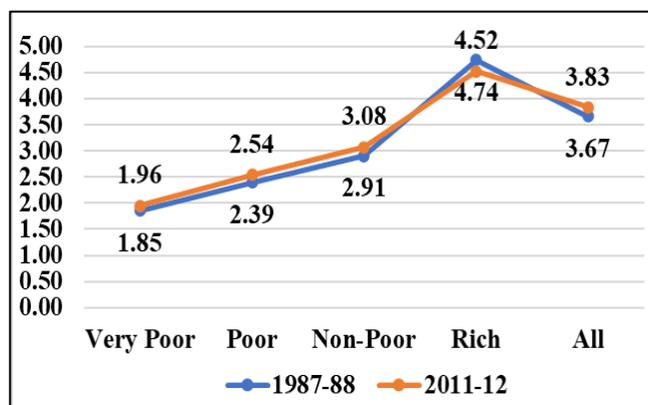


Fig 9: Income group-wise monthly per capita consumption of vegetables (1987-88 to 2011-12)

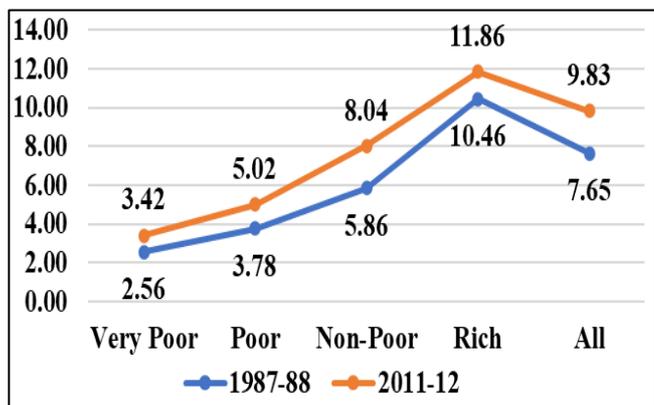


Fig 6: Income group-wise monthly per capita consumption of milk and milk products (1987-88 to 2011-12)

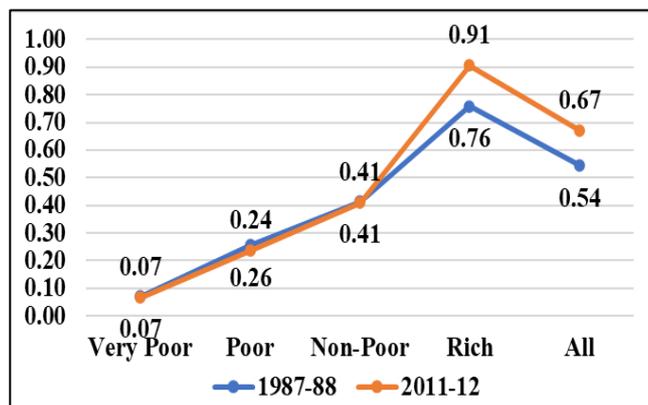


Fig 10: Income group-wise monthly per capita consumption of fruits (1987-88 to 2011-12)

### Measure of Dietary Diversity

The food preferences of the households have diversified over time towards high-value commodities like fruits, vegetables, non-vegetarian food (egg, fish, meat), etc. Table 5 shows the diversity estimates (SID) for the years 1987-88, 1993-94, 2004-05, and 2011-12 along with the percent change during the period. The food diversity index of consumption has increased from 0.780 to 0.822 for the rural sector from 1987-88 to 2011-12 and similar was observed for the urban sector as the index has shown an increase of 9.33 percent from 1987-88 to 2011-12 from SID 0.752 to 0.818. Across the income

groups, the diversity in food consumption increased with the rise in the income of households except for 2011-12, where SID for very poor households was slightly higher than rich households. The level of diversity varied with time, as the SID estimates for 2011-12 was higher than 1987-88 for all the income groups. This shows that the basket of food commodities has widened with time due to changing consumption habits, availability of new food commodities, urbanization, diversification of the agriculture, increased non-farm income, etc in the state.

**Table 5:** Dietary diversity index across income classes and sector in Himachal Pradesh, 1987-2011

Income group	Rural				
	1987-88	1993-94	2004-05	2011-12	% change from 1987-88 & 2011-12
V. Poor	0.705	0.717	0.771	0.817	15.5
Poor	0.759	0.775	0.805	0.850	11.8
Middle	0.776	0.790	0.803	0.831	6.41
Rich	0.789	0.784	0.793	0.814	2.53
All	0.780	0.780	0.796	0.822	5.13
<b>Urban</b>					
V. Poor	0.735	0.770	0.872	0.843	13.5
Poor	0.753	0.788	0.808	0.857	14.67
Middle	0.646	0.811	0.833	0.846	30.77
Rich	0.800	0.740	0.824	0.815	1.25
All	0.752	0.755	0.825	0.818	9.33
<b>HP</b>					
V. Poor	0.706	0.717	0.777	0.819	15.49
Poor	0.758	0.776	0.805	0.850	11.84
Middle	0.765	0.792	0.805	0.832	7.79
Rich	0.790	0.775	0.798	0.814	2.53
All	0.777	0.777	0.800	0.821	5.13

**Source:** Author's calculation from various rounds of NSSO

### Conclusion

The paper has examined the trends and pattern of food consumption in rural and urban Himachal Pradesh across different income groups using NSSO data. The analysis showed that the monthly per capita expenditure (income) of the urban households was higher than the rural households. Over the years the expenditure on food commodities has declined both in rural and urban households, which confirms the Engel's law. The rural households spent more of their income in the food commodities compared to the urban households. Further, a shift has been observed in the budget share of household income over the years from food to non-food commodities. Within the food basket, the share of expenditure has reduced for foodgrains and shifted towards the high-value commodities *viz.* milk, milk products, egg, fish, meat, vegetables, and fruits. The cereals dominated the expenditure share on food commodities followed by milk and milk products during 43<sup>rd</sup>, 50<sup>th</sup> and 61<sup>st</sup> round and reverse was observed during 68<sup>th</sup> round. Also, the per capita consumption of foodgrains has declined over the years and across income groups revealing less consumption of foodgrains by the poor households compared to high-income households. This reduction in the consumption of the foodgrains needs due consideration by the policymakers from the food and nutritional security point of view.

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