

Crop and Livestock Diversification Uttar Pradesh

Amita Maurya^{1*}, V. Kamalvanshi², C. Sen³ and P. S. Badal³

Research scholar¹, Asstt Prof.², Professor³

Department of Agricultural Economics, Institute of Agricultural Science, Banaras Hindu University,
Varanasi-221 005, Uttar Pradesh

*Corresponding Author E-mail: amitamaurya28@gmail.com

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ABSTRACT

Crop Diversification is very important aspect to ensure food security as it increases food availability due to cultivation of different crops in the same area.. Diversification of livestock is also an important component for achieving sustainable livelihood security. Shift in livestock pattern from low productive breeds to high productive breeds is necessary, especially in Uttar Pradesh, which is severely affected by inadequate rainfall, extreme temperature etc. In such situation, livestock contribute a significant source of supplementary income and family nutrition to poor rural people. In present study crop and livestock diversification has been calculated for all the district of Uttar Pradesh by using simpson index. For the study secondary and cross sectional data has been used. Overall diversification crop index was very high in 15 districts and 60 districts were under high crop diversification index. It has been observed that proportionate area was high majorly in wheat and rice crop. In case of livestock 70 districts have been observed under high level of livestock diversification ,only one district i.e. Chitrakoot was found under moderate level of diversification index and no one district had low level of livestock diversification index. The main livestock breed were cow, buffalo, sheep, goat, pig and poultry which were reared by farmers. The creation of basic technological and infrastructural facilities like sustained supply of irrigation water, fertilizer availability, proper roads and transportation is an essential prerequisite for creating enabling conditions for fostering the process of agricultural development and crop diversification as most of these parameters are found to influence the nature and extent of crop, so appropriate policies should be focussed more on technological and infrastructural facilities.

Key words: Crop diversification, Livestock diversification Uttar Pradesh

INTRODUCTION

Agricultural diversification has become a significant component for realizing higher output growth, higher farm income, employment generation, sustainability of natural resources and poverty alleviation

Diversification of crop has immense potential as an economic driver within the agricultural sector which may prove to be of paramount consequence in meeting the challenges which ensued in the post-green revolution scenario.

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In view of shrinking agricultural land and operational holdings which are attributable to the expansion of urban areas and, high growth rate of population, along with changes in consumer food habits, the farmers are straining to include or substitute additional high value crops in to the cropping system. Crop diversification is a strategy to maximize the use of land, water and other resources and for the overall agricultural development of the farm households. It provides the farmers with viable options to grow different crops on their land. Crop Diversification is very important aspect to ensure food security as it increases food availability due to cultivation of different crops in the same area. Diversification of livestock is also an important component for achieving sustainable livelihood security. Shift in livestock pattern from low productive breeds to high productive breeds is necessary, especially in Uttar Pradesh, which is severely affected by inadequate rainfall, extreme temperature etc. In such situation, livestock contribute a significant source of supplementary income and family nutrition to poor rural people. For the developing countries like India, where a majority of families, in both the farm and non-farm sectors, derive their livelihoods from agriculture, sustainability of agriculture cannot be discussed or even defined in isolation of the issue of livelihoods. Uttar Pradesh is the most populous state of India. It is situated in northern part of India and shares the boundary with Uttarakhand, Bihar Madhya Pradesh, Rajasthan, Haryana, Delhi Himanchal Pradesh and an international boundary with Nepal. Uttar Pradesh is currently the fifth largest state of India covering nearly 7.32% of total geographical area of the country (www.indiastat.com). The state is presently divided into 75 administrative districts and has 9 agro-climatic zones. There are 27 districts comes under eastern Uttar Pradesh. Agriculture in Uttar Pradesh is covering country's 11.44% of available land. There is vast variation in rainfall ranging from 600mm to 1200 mm in different districts of the state. Keeping this view in mind this paper presents

the crop and livestock diversification in all the districts of Uttar Pradesh.

MATERIAL AND METHODS

Crop diversification means shift from a regional dominance of one crop to regional production of number of crops, to meet ever increasing demand of cereals, pulses, vegetables, fruits, oilseeds ,fibre, fodder, grasses etc. It aims to improve soil health and maintain dynamic equilibrium of the agro-ecosystem. Crop diversification is intended to promote technological innovations for sustainable agriculture and enable farmers to choose crop alternatives for increased productivity and income. Diversification of livestock is also an important component for achieving sustainable livelihood security. Shift in livestock pattern from low productive breeds to high productive breeds is necessary, especially in Uttar Pradesh, which is severely affected by inadequate rainfall, extreme temperature etc. In such situation, livestock contribute a significant source of supplementary income and family nutrition to poor rural people. Secondary data was collected for all the districts of the state from various published sources of government authorities and other related sources. Cross sectional data pertaining to area, production, productivity of different crops or crop groups and number of different livestock for the districts were collected.

Simpson Diversity Index was constructed for districts using following formula-

$$DI_j = 1 - \left(\sum_{i=1}^N P_i^2 \right)$$

Where, DI_j = diversification index of j th component { j = crop (area) and livestock (in no.)}

P_i = proportion of the i th variable (crop/crop group/livestock) in their respective total.

RESULT AND DISCUSSION

Extent of crop and livestock diversification

Keeping in view the changing social, economic and climatic environment, the issue of sustainable livelihood security becomes even more important for farm sector, diversification of crop and livestock is viewed

as a potential tool for sustainable livelihood security. Diversification could be adopted as a risk management strategy to reduce vulnerability of poor households and to support them in managing risks by diversifying their farming activities.

This section deals with diversification analysis of crops and livestock rearing. As mentioned earlier, the analysis has been carried out at district level. The value of index ranges from 0 to 1. Diversification indices have been classified into four categories viz. low level (index value less than 0.25), moderate level (index value from 0.25 to 0.5),

high level (index value more than 0.5 to 0.75) and very high level (index value more than 0.75). This section is again divided into two parts i.e. first measurement of crop diversification and second measurement of livestock diversification.

Crop diversification Index

Crop diversification indices have been constructed for districts. There are four crop groups viz; cereals, pulses, oilseeds and vegetable crops group. The diversification indices have been constructed for each crop group as well as all the crops taken together.

Table 3: Crop and Livestock diversification index

S. No.	Districts	Cereals Crop diversification index	Pulses Crop diversification index	Oilseeds Crop diversification index	Vegetable Crop diversification index	Overall Crop diversification index	Livestock diversification index
1	Bijnor	0.91	0.99	0.99	0.01	0.64	0.69
2	Moradabad	0.72	0.99	0.99	0.05	0.69	0.69
3	Rampur	0.65	0.99	0.99	0.04	0.64	0.72
4	Saharanpur	0.86	0.99	0.99	0.04	0.74	0.69
5	Muzaffar Nagar	0.93	0.99	0.99	0.01	0.63	0.66
6	Meerut	0.92	0.99	0.99	0.00	0.71	0.63
7	Ghaziabad	0.86	0.99	0.99	0.05	0.74	0.59
8	Buland Shahar	0.80	0.99	0.99	0.04	0.78	0.60
9	Aligarh	0.78	0.99	0.99	0.01	0.77	0.60
10	Mathura	0.76	0.99	0.99	0.01	0.73	0.65
11	Agra	0.86	0.99	0.99	0.05	0.80	0.68
12	Firozabad	0.86	0.99	0.99	0.04	0.82	0.65
13	Etah	0.75	0.99	0.99	0.05	0.75	0.67
14	Mainpuri	0.75	0.99	0.99	0.01	0.74	0.69
15	Buduan	0.74	0.99	0.99	0.01	0.74	0.68
16	Bareilly	0.73	0.99	0.99	0.00	0.70	0.71
17	Pilibhit	0.70	0.99	0.99	0.03	0.67	0.70
18	Shahjhanpur	0.69	0.99	0.99	0.05	0.68	0.68
19	Lakhimpur Kheri	0.87	0.99	0.99	0.01	0.71	0.68
20	Sitapur	0.81	0.99	0.99	0.05	0.74	0.71
21	Hardoi	0.71	0.99	0.99	0.01	0.70	0.69
22	Unnao	0.69	0.99	0.99	0.02	0.68	0.72
23	Lucknow	0.68	0.99	0.99	0.05	0.67	0.72
24	Raebareli	0.66	0.99	0.99	0.01	0.65	0.68
25	Farrukhabad	0.88	0.99	0.99	0.05	0.83	0.70
26	Etawah	0.79	0.99	0.99	0.01	0.78	0.72
27	Kanpur Dehat	0.79	0.98	0.99	0.00	0.77	0.75
28	Kanpur Shahar	0.83	0.98	0.99	0.01	0.80	0.72
29	Jalaun	0.86	0.87	0.96	0.02	0.70	0.74
30	Jhansi	0.91	0.81	0.95	0.01	0.68	0.67
31	Lalitpur	0.87	0.79	0.98	0.05	0.65	0.52
32	Hamirpur	0.91	0.81	0.96	0.02	0.68	0.67
33	Banda	0.85	0.87	0.99	0.05	0.71	0.65
34	Fatehpur	0.77	0.97	0.99	0.02	0.74	0.75
35	Pratapgarh	0.63	0.99	0.99	0.01	0.63	0.70
36	Allahabad	0.67	0.99	0.99	0.02	0.66	0.70
37	Behraich	0.75	0.99	0.99	0.01	0.74	0.70
38	Gonda	0.76	0.99	0.99	0.05	0.73	0.66
39	Barabanki	0.69	0.99	0.99	0.04	0.68	0.72
40	Faizabad	0.70	0.99	0.99	0.01	0.69	0.68
41	Sultanpur	0.72	0.99	0.99	0.02	0.70	0.67
42	Siddarth Nagar	0.54	0.99	0.99	0.02	0.54	0.70
43	Maharajganj	0.59	0.99	0.99	0.03	0.59	0.69
44	Basti	0.69	0.99	0.99	0.04	0.67	0.73
45	Gorakhpur	0.57	0.99	0.99	0.02	0.57	0.70
46	Deoria	0.58	0.99	0.99	0.01	0.57	0.74
47	Mau	0.59	0.99	0.99	0.04	0.59	0.73
48	Azamgarh	0.61	0.99	0.99	0.05	0.61	0.70
49	Jaunpur	0.70	0.99	0.99	0.02	0.69	0.71
50	Ballia	0.70	0.99	0.99	0.03	0.69	0.70
51	Ghazipur	0.66	0.99	0.99	0.04	0.66	0.73
52	Varanasi	0.71	0.99	0.99	0.05	0.71	0.72
53	Mirzapur	0.70	0.98	0.99	0.02	0.69	0.69
54	Sonebhadra	0.82	0.96	0.99	0.03	0.79	0.67

55	Bhadohi	0.67	0.99	0.99	0.04	0.66	0.65
56	Kushinagar	0.75	0.99	0.99	0.03	0.70	0.74
57	Mahoba	0.95	0.68	0.96	0.02	0.60	0.65
58	Ambedkarnagar	0.63	0.99	0.99	0.05	0.63	0.72
59	Kaushambi	0.74	0.98	0.99	0.03	0.72	0.75
60	Jyotiba Phule Nagar	0.85	0.99	0.99	0.04	0.74	0.60
61	Gautam Budh Nagar	0.70	0.99	0.99	0.02	0.67	0.52
62	Maha Maya Nagar	0.88	0.99	0.99	0.06	0.81	0.58
63	Chitrakoot	0.84	0.89	0.99	0.03	0.73	0.48
64	Chandauli	0.60	0.99	0.99	0.04	0.60	0.71
65	Shravasti	0.67	0.98	0.99	0.05	0.66	0.65
66	Balrampur	0.79	0.98	0.99	0.02	0.75	0.69
67	Sant Kabir Nagar	0.60	0.99	0.99	0.03	0.59	0.74
68	Baghpat	0.90	0.99	0.99	0.03	0.67	0.58
69	Kannauj	0.86	0.99	0.99	0.05	0.80	0.75
70	Auraiya	0.73	0.99	0.99	0.03	0.73	0.74
71	Kanshiram Nagar	0.79	0.99	0.99	0.04	0.78	0.56
72	Amethi	0.66	0.99	0.99	0.05	0.65	0.70
73	Shamli	0.87	0.99	0.99	0.03	0.70	0.68
74	Hapur	0.88	0.99	0.99	0.02	0.78	0.59
75	Sambhal	0.79	0.99	0.99	0.03	0.78	0.66

On analyzing the Table 3.1.1, it is clear that in pulse and oilseed groups, diversification index is very high in all the districts which means more than one pulse crops like urad, moong, masoor, gram, and arhar were grown in all the districts, same scenario has been observed in case of oilseed crops like, mustard, til, groundnut, sunflower and soybean. While in case of cereals, in 39 districts out of 75, diversification index was very high consisting crops as rice, wheat, jowar, Bajra and maize however, 36 districts were under high diversification index, and wheat was on top of the list area wise in these districts. In case of vegetables, diversification index was near to zero which means vegetable production was specialized to a particular vegetable (seasonal vegetables). Overall diversification crop index was very high in 15 districts and 60 districts were under high crop diversification index. It has been observed that proportionate area was high majorly in wheat and rice crop.

Livestock diversification Index

Diversification of livestock is also an important component for achieving sustainable livelihood security. Shift in livestock pattern from low productive breeds to high productive breeds is necessary, especially in Uttar Pradesh, which is severely affected by frequent droughts (eastern Uttar Pradesh), inadequate rainfall, extreme temperature and poor quality of land and groundwater. In such situation, livestock contribute a significant source of supplementary income and family nutrition to poor rural people. The presentation and discussion on this account is given in this

section. The table reveals that the value of livestock diversification ranged from 0.48 to 0.75. In concern with district level comparison, four districts i.e. Kanpur Dehat, Fatehpur, Kaushambi and Kannauj were under very high livestock diversification index, 70 districts have been observed under high level of livestock diversification, only one district i.e. Chitrakoot was found under moderate level of diversification index and no one district had low level of livestock diversification index. The main livestock breed were cow, buffalo, sheep, goat, pig and poultry which were reared by farmers.

Policy Implications

1. Agriculture appeared to be the main source of income in plain region, so more attention towards its improvements in the plain, should be given.
2. The creation of basic technological and infrastructural facilities like sustained supply of irrigation water, fertilizer availability, proper roads and transportation is an essential prerequisite for creating enabling conditions for fostering the process of agricultural development and crop diversification as most of these parameters are found to influence the nature and extent of crop, so appropriate policies should be focussed more on technological and infrastructural facilities.
3. In Chitrakoot district livestock diversification is moderate, so to avoid risk in income of the farmers, more breeds of cow, buffalos should be rear for more milk yield and poultry farm should be introduced for livestock diversification.

REFERENCES

1. Acharya, S. P. and Basavaraja, H., Crop Diversification in Karnataka: An Economic Analysis, *Agricultural Economics Research Review*, **24**: 351-357 (2011).
2. Acharya, S. S., Crop diversification in Indian agriculture. *Agricultural Situation in India*, **60(5)**: 239- 250 (2003).
3. Bhatia, J. and Tewari, S. K., Diversification, Growth and Stability of Agricultural Economy in U.P. *Agricultural Situation in India*, **45(7)**: 397-403 (1990).
4. Bhatia, J. and Tewari, S. K., Diversification, Growth and Stability of Agricultural Economy in U.P. *Agricultural Situation in India*, **45(7)**: 397-403 (1990).
5. Joshi, P. K. and Singh, D. K., Agricultural Diversification in Northeastern Region of India: Implications for Growth and Equity. *Indian Journal of Agricultural Economics*, **61(3)**: 328-340 (2006).
6. Dandekar, V. M., Introduction to seminar: Data base and methodology for the study of growth rate in agriculture. *Indian Journal of Agricultural Economics* **35(2)**: 1-12 (1980).
7. FAO, Crop Diversification in Asia- Pacific region. Available at www.fao.org/dorep/003/x690e/x6906e06.htm. Accessed on Jan, 2013 (2001).
8. Ghosh, K. B., Factors Affecting Farmers' Decision to Cultivate High-valued Crops: A Case Study of Burdwan District of West Bengal, *IASSI Quarterly*, **28(1)**: 148- 159 (2009).
9. Gupta, R. P. and Tewari, S. K., Factors Affecting Crop Diversification: An Empirical Analysis. *Indian Journal of Agricultural Economics*, **40(2)**: 304-309 (1985).
10. Haque, T., Regional Trends and Patterns of Diversification of the rural economy in India. *Indian Journal of Agricultural Economics*. **40(2)**: 291-297 (1985).
11. Lathika, M. and Ajith Kumar, C. E., Growth trends in area, production and productivity of coconut in India. *Indian Journal of Agricultural Economics*, **60(4)**: 686-697 (2005).
12. Maheshwari, A., Agricultural growth in a semi-arid area-The case of Karnataka. *Indian Journal of Agricultural Economics*. **51(3)**: 315-327 (1996).
13. Marothia, D. K., Singh, R. K. and Koshta, A. K., Crop diversification: Post reform lessons from Chhattisgarh. *Agric. Situation in India*, **64(3)**: 215-225 (2007).
14. Mohanty, B. C. and Naik, D., Trends in area, production and productivity of Groundnut in Orissa in comparison with national and global level. *Agricultural Situation in India*, **46(3)**: 437-441 (1991).
15. Pal, S. and Kar, S., Implication of the methods of Agricultural Diversification in reference with Malda district: Drawback and Rationale. *International Journal of Food, Agriculture and Veterinary Sciences*, **2(2)**: 97-105 (2010).