DYNAMICS OF LIVESTOCK HUSBANDRY IN WESTERN TRANS-GHAGHARA (DEVI PATAN REGION), UTTAR PRADESH: A CASE STUDY

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Abstract

Livestock husbandry is one of the important primary economic activities in the world which is practiced by almost 3 billion people. Livestock husbandry in India is major occupation which is practiced by about 70 percent population. In the present study various factors which determine the level, intensity, growth and development of livestock husbandry have been highlighted in the Western Trans-Ghaghra Region. The study is entirely based on secondary sources of data. The data have acquired from livestock censuses and district statistical magazines. In the present study growth of major species of livestock husbandry have been analyzed during two livestock census period (2003-2012). Moreover, livestock area and livestock population indices have been devised to assess growth in level and intensity of livestock husbandry. The inaccessibility of market, lack of application of modern techniques, lack of veterinary services, shrinking of grazing lands, lack of information of latest schemes and low socio-economic standard are the major reasons which are hindering the growth of livestock husbandry in the region.

Keywords: Economic activities, occupation, intensity, livestock husbandry, modern techniques.

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Introduction

Livestock husbandry is one of the important primary economic activities in the world which is practiced by almost 3 billion people. It is mostly practiced by the rural people in the developing world but in the recent decades commercialization of this activity has developed this occupation as a major occupation even in the urban fringe areas(Khan, et.al 2014). Livestock husbandry in India is major occupation which is practiced by about 70 percent population. It is a major source of nutrients, meat and draught power in agriculture, manures, dung cakes and income generation in India. In India livestock sector contributes 4.5 percent to the total GDP and 26 percent to the agricultural GDP. The peculiar feature of Indian livestock sector is that it is mostly practiced in the rural areas by the small and marginal farmers. The major farming system of India is crop-livestock farming because in this system income for agricultural is provided by livestock and fodder for livestock comes from agriculture and livestock provides income for farmers in non-harvesting season. Livestock rearing is done in different ways following various forms of agricultural practices like traditional mixed farming, commercial dairy farming and nomadic herding in distinct agronomic and socio-economic conditions (Khan, Iqubal, Rehman, 2011). Moreover the size of herd ranges from 1 to 2 animals and these animals are mostly feed on agricultural residues while in some areas they are reared in common lands and pastures. Major species of livestock in India are buffalo, cow, goat and sheep while other animals are reared for draught power. Buffalo is a major livestock species in North and Central Indian states while in the dry regions of the country goat and sheep are major species of livestock. Over the last decade or so, the population of buffalo and goat in most states is increasing more rapidly than other species; they are considered as the blessing animals of the future for the country (Khan, Rehman, and Salman, 2012). The livestock censuses conducted by the government of India has indicated that highest growth is shown by buffalo while cow and other livestock species have shown lesser growth because the high productivity of buffalo and its use in meat industry has encouraged people to increase number of buffaloes. The abnormal growth of buffalo in comparison to other species is attributed to the scheme of 'Operation Flood' to enhance milk production, the increasing demand of meat in national and international markets due to increasing urbanization, the improvement in purchasing power among middle income households, the changing food habits from vegetarian to animal-derived foods and the liberalization of agricultural trade under the auspices of the WTO (Khan and Iqubal, 2010).

Livestock husbandry is a major source of income and employment generation particularly in the rural areas. The most valuable feature of this occupation is that it consumes the unemployed labor of the households. Livestock is an important source of income and employment in rural areas. It provides balanced nutrition in the form of milk, egg and meat besides farm power. Animal husbandry plays a major role in providing employment especially self-employment with high participation of women (Tabrez and Khan, 2014). Livestock husbandry has become a major instrument for the socio-economic development of rural people by providing employment, nutrition and livestock derived products for agriculture. It plays a catalytic role in modelling the socio-economic profile of the rural masses through the production of milk, meat and assisting the agricultural operations in many ways (Khan, Khan and Rehman, 2009). The milk production from livestock husbandry is an important operation which provides nutrients and employment to millions of dairy farmers. Increasing demand for milk and milk products has created huge market and employment opportunities for millions of dairy farmers to flourish in India (Khan and Parashari, 2014). Various environmental agencies and organizations have underlined the key role of animal husbandry in sustainable environmental development. Livestock husbandry would be very much effective and fruitful for increasing viability of marginal and small farmers and for improving the biological and chemical composition of soils through the use of biomass produced from combined crop-livestock farming system (Khan and Iqubal, 2009). In the agriculturally dependent regions the role of livestock becomes important for sustaining the crop productions. Although crops and livestock are interdependent to a large extent, the later constitute an important mechanism for cropping with risk of crop failure (Khan, Rehman and Salman, 2012).

The role of animal husbandry in the socio-economic development has been recognized by various government agencies policymakers in India. This occupation has been modelling the socio-economic attributes of rural people by providing employment and perennial source of capital building. Moreover, women have greater involvement in animal husbandry; consequently women empowerment is strengthened by it. They offer more contribution in dairy husbandry practices like care of new born calf, cleaning of animal shed, cleaning of utensils, storage of concentrates, feeding young calf, diagnosis of common disease and care at home level, care of sick animals, watering the livestock, offering the concentrate mixture, soaking the concentrate mixture, care during pregnancy, disposal of infected litter materials, grooming, cleaning and bathing buffaloes and cows, compost making, milking of animals (Lahoti, Chole and Rathi,

2012). Steady rise in in the demand for livestock derived products has urged people to expand their herd to maximize their profit. These activities have contributed to the food basket, nutrition security, and household income of the farmers and play a significant role in generating gainful employment in the rural areas, particularly among the landless, small and marginal farmers and women, besides providing cheap and nutritious food (Khan and Parashari, 2014). Indian economy is mainly rural and agricultural in nature and the fragmentation of landholdings have presented a bigger challenge to the sustainability and profitability of agriculture, so crop-livestock farming system is being adopted by the most of small and marginal farmers who constitute 80 percent of the rural population. Various government agencies have starts various programmes to increase the production of animal derived products which has resulted in the sharp increase of number pf animals in India. Currently India has the largest livestock base in the world. Population explosion, change in the food habits of people and rise of globally linked market have opened the new vistas of growth of this sector. Animal husbandry has become a blessing for poor especially small and marginal farmers by ensuring financial security and sustainable rural development. Moreover, livestock derived products have important share in country's export which bring foreign exchange, so it is also strengthening balance of payments.

Despite having huge importance in the socio-economic development of people and maintaining the environment sustainability livestock husbandry is not commercially developed in the country. The crop-livestock integration is the main farming system in India in which more importance is given to crops and livestock is always considered as the secondary source of livelihood generation. Moreover, the policies and programmes initiated by the government could not reach the livestock rearers at grass root level.

Aims of the Study:

1-   To highlight Spatial and temporal pattern of animal husbandry.

2-   To assess the share of various species in animal husbandry.

3-   To analyze the level and intensity of animal husbandry in the study area.

Database and Methodology:

Present study is entirely on secondary sources of data. The study has attempted to explain the district level dynamics of animal husbandry in the Devi Patan region. The data have been

obtained from district statistical magazines, livestock census reports and statistical divisions of district development offices. For the study only four species of livestock i.e. buffalo, cattle, goat and sheep has been taken into consideration. The percentage growth of livestock between livestock census of 2003 to livestock census of 2012 has been calculated. To measure the availability of livestock for people livestock-per 1000 population and livestock- per hectare indices has been devised. The percentage growth of various species at district level has been calculated. The processed data has been presented with suitable diagrams, maps and charts.

Study Area:

The Devi Patan region has been selected as the study area which is the most backward region of Uttar Pradesh which lies in western part of the Trans-Ghaghara plain to include four districts of Bahraich, Shrawasti, Balrampur and Gonda. Devi Patan plain is the most backward region of Uttar Pradesh, which lies at the foothills of the Shiwalik range. It is the western part of the Trans-Ghaghara plain. Fig. 1 shows that it is situated at the sub-Himalayan belt also known as sub-Himalayan west and the eastern part the sub-Himalayan east. The total geographical area of Devi Patan is 14,229 sq. km. Its international boundary touches with Nepal. Its latitudinal extent is 26⁰ 40′ 30″ to 28⁰ 24′ 30″ North and longitudinal extent is 81⁰ 03′ to 82⁰ 49′ East. It is bounded on the north and north-east by Nepal fringed by a belt of forest running at the foot hills of the outer ranges of the Himalayas, on the east and south-east by districts of Basti and Siddharthnagar. To its south and south-west it is bounded by Bara Banki and Faizabad and on the west by Kheri and Sitapur districts. The total population of the region is 10.18 million while it accounts for 199.81 million in Uttar Pradesh as a whole (2011 census). The distribution of population by districts in the Devi Patan is 3.48 million in Bahraich, 1.12 in Shrawasti, 2.15 in Balrampur and 3.43 million in Gonda. This region accounts for the population density of 716 persons/ km² which is far below the U.P. average of 828. The districts against their population density in descending order are Balrampur (642), Bahraich (664), Shrawasti (679) and Gonda (857). The sex-ratio according to 2011 census is 902 in Devi Patan. It varies among the districts of Devi Patan, it is 891 in Bahraich, 875 in Shrawasti, 922 in each Balrampur and Gonda whereas the U.P. average accounts for 908. The region has 3657050 heads of total livestock out which 1480603 are cattle, 1058143 buffalo, 1068932 goats and 49372 are sheep.
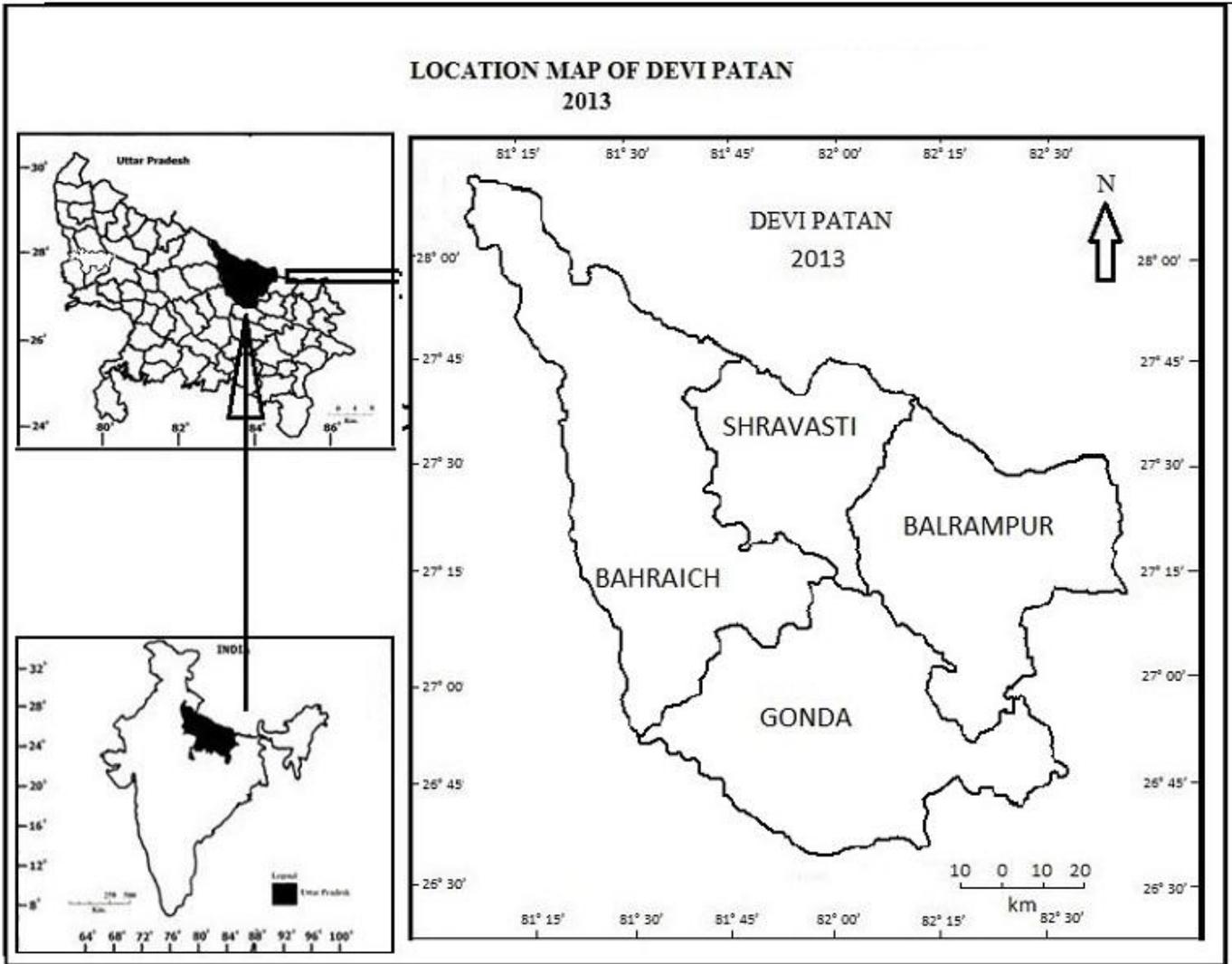
Fig. 1

Results and Discussion:

Animal husbandry is a major economic activity but it is only practiced on subsistence basis. Despite enormous importance in livelihood generation this activity has not acquired the status of main commercial activity. Livestock has equipped people with food, income, draught power, fertilizer and act as the major source of livelihood for millions of people in our country, where crop farming faces challenges of crop failure. India is one of the fastest growing economies of the world and it mainly depends on the agriculture sector as a tool for progress (Kumar. et. al. 2012). The growth of animal husbandry depends on various factors such as demand for animal product in the market, social and economic background of people, government policies,

availability of pastures, availability of market and technological adoption. The progress of this sector depends on the growth and distribution of animals in any region. The spatial and temporal pattern of animal husbandry in Devi Patan region has been reflected through the change in number of animals between two livestock census period (2003-2012). The region has 3657050 heads animals out of which 1058185 are buffaloes, 1480603 are cattle, 1068932 goats and 49372 sheep. The distribution of animals in the region at district level varies from 1424549 in Bahraich district to 475960 in Shrawasti district while Balrampur has 621667 animals and Gonda has 1134874 animals in 2012 (table 1). The number of buffaloes are highest in Gonda (395223) followed by Bahraich (365963) and Balrampur (165971) while Shrawasti (130956) has lowest population of buffaloes. The largest population of cattle is found in Bahraich (536178) followed by Gonda (470504), Balrampur (273567) and Shrawsti (200354). Goats are small ruminant and reared for household milk production and commercial meat production. Their number is highest in Bahraich (502321), followed by Gonda (253326), Balrampur (173832) and Shrawasti (139453). The sheep are also reared in the study area mainly for wool production. Their distribution ranges from 20087 in Bahraich district to 5197 in Shrawasti district. The temporal variation in the animal husbandry is indicated by percentage change in the number of major species of livestock during 2003-2012. Total number of animals has increased by 13.32 percent but at district level Shrawasti (21.46 percent) has recorded highest growth and Gonda (13.32) has recorded lowest growth. The species-wise growth of animals has been experienced differently by different districts of the region. The growth rate of buffalo varied from 23.23 percent in Bahraich district to 13.37 percent in Gonda district while the growth of cattle ranges from 21.40 percent in Shrawasti to 4.33 percent in Balrampur district. The growth of goat varies from 24.37 percent in Shrawasti to 1.82 percent in Gonda while growth of sheep ranges from 46.02 percent in Bahraich to 7.20 percent in Shrawasti during 203-2012 (table 1 and fig 2).

Table 1. Distribution and growth of Animal Hsbandry in Devi Patan (2003-2012)

S. No.	Name of District	Buffalo		%	Cattle		%	Goat		%	Sheep		%	Total Livestock		%
		2012	2003	Change	2012	2003	Change	2012	2003	Change	2012	2003	Change	2012	2003	Change
1	Bahraich	365963	296972	23.23	536178	471634	13.69	502321	438552	14.54	20087	13756	46.02	1424549	1220914	16.68
2	Shrawasti	130956	109843	19.22	200354	165037	21.40	139453	112125	24.37	5197	4848	7.20	475960	391853	21.46
3	Balrampur	165971	143246	15.86	273567	262219	4.33	173832	151150	15.01	8297	6963	19.16	621667	563578	10.31
4	Gonda	395253	348626	13.37	470504	446720	5.32	253326	248809	1.82	15791	12255	28.85	1134874	1056410	7.43
Total		1058143	898687	17.74	1480603	1345610	10.03	1068932	950636	12.44	49372	37822	30.54	3657050	3232755	13.12

Source: Livestock Census 2003 and 2012

Devi Patan

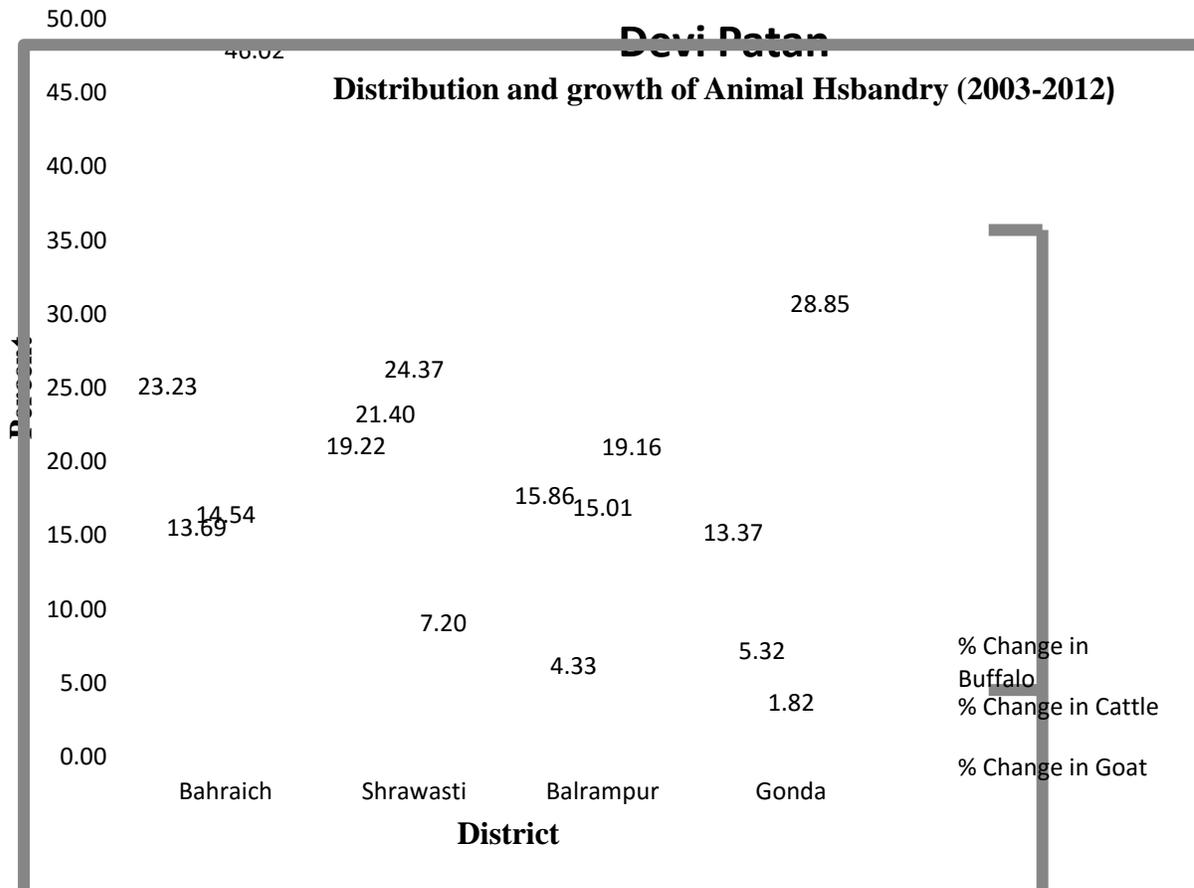**Distribution and growth of Animal Hsbandry (2003-2012)**

Fig. 2

Animal husbandry is an activity in which various species of livestock are domesticated for various types of animal products. The composition of animal herd is mainly determined by the income of people, caste, community, landholding, climate, labour and nature of demand of animal products in the market. The complexities of that social structure affected the level of employment generation through livestock husbandry (Iqubal, 2010). In the study area buffalo, cattle, goat and sheep are the common species which are domesticated so their share in total livestock has been analyzed. The share of cattle (40.49 percent) is highest in total livestock followed by goat (29.23 percent), buffalo (28.93 percent) and sheep (1.35 percent) (table 2 and fig. 3). The high proportion of cattle is a peculiar feature of the region while in most of districts of Uttar Pradesh share of cattle is not high. Their share at district level ranges from 44.01 percent in Balrampur to 37.64 percent in Bahraich district. The high share of cattle in this region is mainly due to backward agriculture system in which oxen are used as draft animals. Cows are

reared in larger number for milk production and for religious obligation of Hindu community. Their slaughter is also prohibited. The above reasons encouraged the larger share of cattle in animal husbandry. Goats (40.49 percent) have the second largest share in total livestock because they are mainly reared by the underprivileged and poor people. Those people who do not have capital to purchase large animals prefer to purchase small ruminant like goat which are mainly reared for household milk production and meat production. The socio-cultural practices influenced the growth and ownership of cattle and other livestock population (Batra, 2005). The share of buffalo is 28.93 percent in total livestock while in the study area she buffalo is mainly reared for milk production while the male buffalo is reared for meat production. The expansion of dairy and meat industry have provided ready market for animal derived products so people have increased the buffalo stock. The sheep have almost negligible share of 1.35 percent in animal husbandry but they are important for wool production (table 2 and fig. 3). They are mainly reared with the goats and we find few sheep in large herd of goats.

Table 2. Percentage Share of Various Species of Livestock in Animal Husbandry in Devi Patan

S. No.	Name of District	Buffalo	%	Cattle	%	Goat	%	Sheep	%	Total Livestock
1	Bahraich	365963	25.69	536178	37.64	502321	35.26	20087	1.41	1424549
2	Shrawasti	130956	27.51	200354	42.09	139453	29.30	5197	1.09	475960
3	Balrampur	165971	26.70	273567	44.01	173832	27.96	8297	1.33	621667
4	Gonda	395253	34.83	470504	41.46	253326	22.32	15791	1.39	1134874
Total		**1058143**	**28.93**	**1480603**	**40.49**	**1068932**	**29.23**	**49372**	**1.35**	**3657050**

Source: Livestock Census 2003 and 2012

Devi Patan

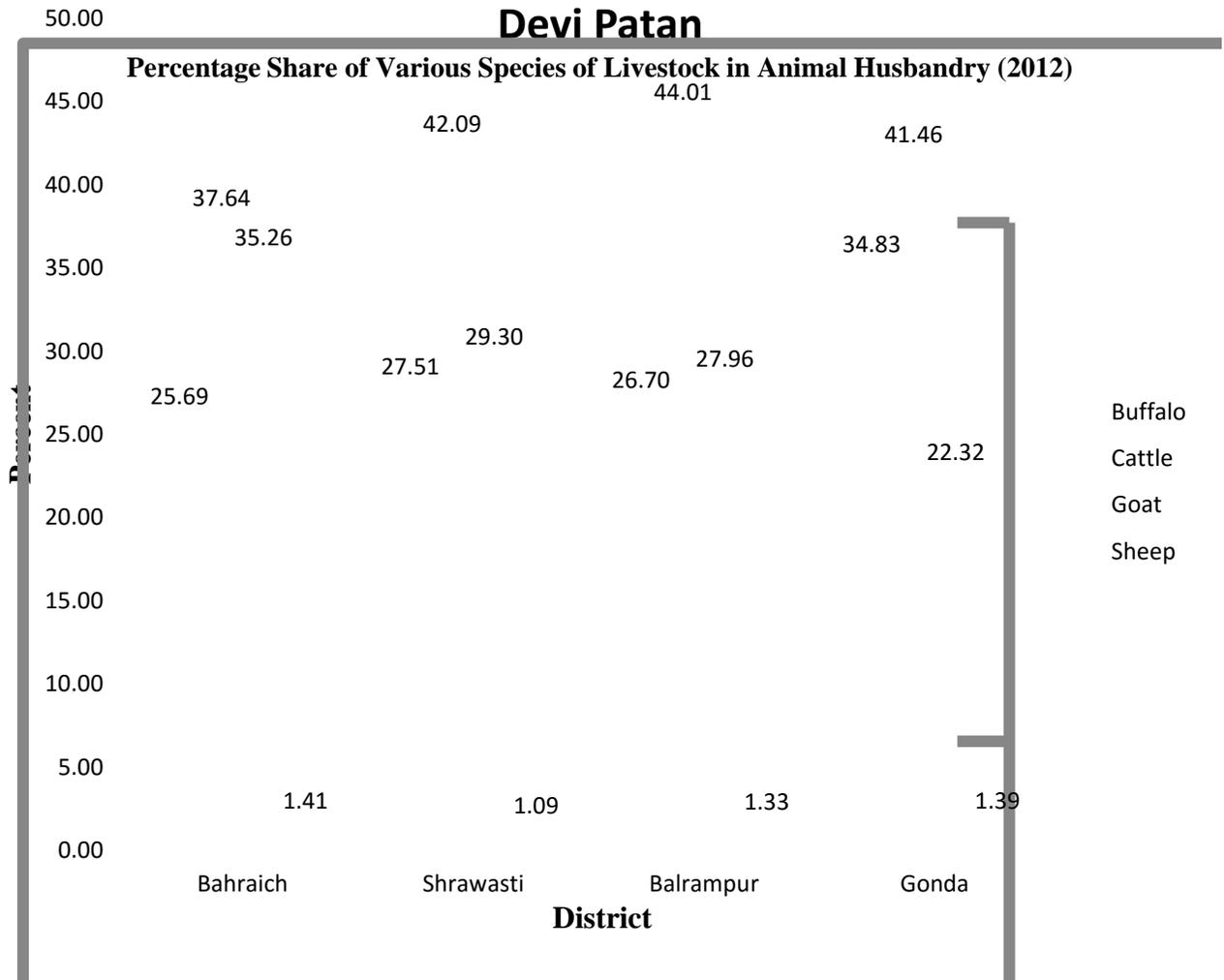**Percentage Share of Various Species of Livestock in Animal Husbandry (2012)**

Fig. 3

Cattle and buffalo are most important species in the animal husbandry they are most important for meat industry and dairy industry. In case of bovine meat, India can lead by creating infrastructure for hygienic production as far as milk (dairy and fresh) export is concerned it will increase the milk production further through sustained breed improvement program (Dayakar et.al, 2005). Moreover, most of animal rearers in India keep these two species in their herd because they have high productivity and multiple uses in dairy industry, meat industry, draught power and manure for agriculture and they are very useful in maintaining the sustainable environmental growth. The cattle and buffalo have increased tremendously but the male cattle (oxen) and male buffalo have not increased much as compared to their female counterparts. The introduction of crossbreed cattle has resulted in the increase in milk production (Nyholm, K. et

al, 1974). Table 3 and fig. 4 show that female cattle have increased by 37.74 percent while male cattle have declined by -31.28 percent during 2003-2012. At district level growth of female cattle varies between 85.10 percent in Bahraich to 14.74 percent in Gonda district while growth of male cattle varies between 18.70 percent in Shrawasti to -46.56 percent in Bahraich district. The main reason for the decline of male cattle (oxen) is technological implementation in agriculture which has decreased their use in agriculture. The government has also prohibited the cow slaughter which has reduced their use in the meat industry so people started to rear other species of livestock instead of male cattle. Cows are reared commonly in the study area because they are easy to manage and require less capital investment as compared to buffalo. Female buffalo have grown by 49.61 percent while male buffalo have risen by 10.81 percent. At district level, the growth of female buffalo ranges between 123.00 percent in Bahraich to 21.25 percent in Gonda district while growth of male buffalo vary between 141.42 percent in Gonda to -27.91 in Bahraich district (table 3 and fig 4). The use of male buffalo in agriculture has declined drastically due to use of machines but their use in meat industry has increased while the sharp increase in female buffalo is attributed to rise in demand for milk products and nutrients for the increasing population. Earlier male buffalo were used in agriculture as the draught power but use of technology in in agriculture has reduced their utility in agriculture. On the other hand, rearing of female buffalo has increased due to their multiple utility in milk production and in meat industry. When female buffalo become unproductive they are used for meat production also.

S. No.	Name of District	Female Cattle			Male Cattle			Female Buffalo			Male Buffalo		
		2003	2012	% Change	2003	2012	% Change	2003	2012	% Change	2003	2012	% Change
1	Behraich	208064	385133	85.10	262088	140050	-46.56	164110	365963	123.00	132862	95783	-27.91
2	Shrawasti	91535	111053	21.32	73352	87070	18.70	93332	130956	40.31	16511	30397	84.10
3	Balrampur	154932	177769	14.74	107287	91706	-14.52	123206	165971	34.71	20040	32439	61.87
4	Gonda	271510	326834	20.38	153610	90342	-41.19	325978	395253	21.25	22448	54194	141.42
Total		728044	1002801	37.74	598340	411180	-31.28	708629	1060155	49.61	193864	214825	10.81

Table 3 Growth of Cattle and Buffalo in the Devi Patan (2003-2012)

Source: Livestock Census 2003 and 2012

Devi Patan

Species-wise Growth of Livestock Animal Husbandry (2003-2012)


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200.00 ┬
        │
        │                                                              141.42
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100.00 ┤  85.10                            84.10
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        │                                       34.71
 50.00 ┤            40.31
        │         21.32 18.70                         20.38   21.25
        │                              14.74
  0.00 ┤
        │      Bahraich        Shravasti      Balrampur         Gonda
        │                                        -14.52
        │            -27.91
-50.00 ┤  -46.56                                      -41.19
        │
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                              District
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% Change in Female Cattle

% Change in Male Cattle

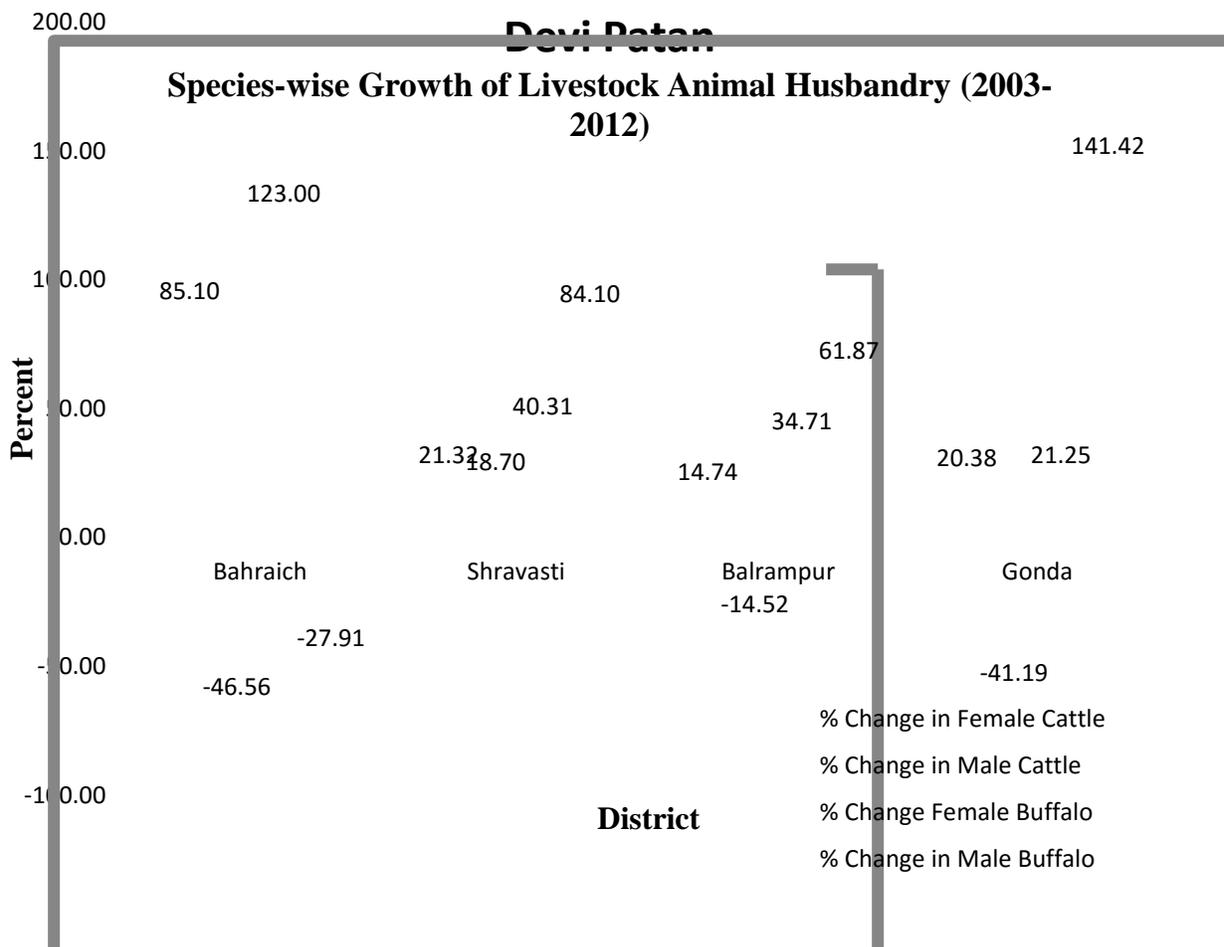% Change Female Buffalo

% Change in Male Buffalo

Fig. 4

Livestock area index (number of livestock per hectare) and population index (livestock per thousand population) is shown in the table 4. The availability of livestock per 1000 population and per hectare are one the most important indicators to measure the level and intensity of animal husbandry. Apart from its immense and rising contribution to agricultural gross domestic product and food and nutritional security, livestock has the capacity to reduce interpersonal economic disparities as there exists considerable scope to enhance its economic and employment contributions (Kumar, 2006). The livestock-area index refers the concentration or density of livestock in the area. Density of livestock based on per 1000 population may be proved advantageous for planners because population change in relation to animal growth presents a most dynamic and complex phenomenon. Table 4 shows that livestock per 1000 population was 403.45 in 2003 which declined to 359.64 by -10.86 percent during 2003-2012. At district level -

13.64 percent decline was recorded in Balrampur while -6.91 percent was recorded in Shrawasti district. The decline in livestock per 1000 population indicates that there are huge possibilities for the growth of animal husbandry and demand for animal derived products will definitely grow.

Another livestock development livestock per hectare has also been taken as an indicator to assess the livestock density variation. This refers to the concentration or density of livestock per hectare. This indicator is most versatile and reliable because land is fixed factor while animal growth is a dynamic factor and availability of livestock per hectare indicates the intensity of animal husbandry although it also highlight the possibilities of animal husbandry. The availability of livestock per hectare was 2.27 which rose to 2.57 by 13.12 percent in the region during 2003-2012 (table 4 and fig. 5). The district level change in livestock per hectare varies from 21.46 Percent in Shrawasti to 7.43 percent in Gonda district. The rise in the livestock per hectare highlight that animal husbandry in the study area has increased and intensified while it shows the future prospects of development of this sector.

Table 4 Growth of Livestock Per 1000 Population and Per Hectare in Devi Patan (2003-2012)

S. No.	Name of District	Livestock Per 1000 Population		% Change	Livestock Per Hectare		% Change
		2012	2003		2012	2003	
1	Bahraich	407.30	450.71	-9.63	2.84	2.43	16.68
2	Shrawasti	426.17	457.78	-6.91	2.56	2.11	21.46
3	Balrampur	289.31	334.99	-13.64	1.86	1.68	10.31
4	Gonda	333.26	381.98	-12.76	2.84	2.64	7.43
Total		**359.64**	**403.45**	**-10.86**	**2.57**	**2.27**	**13.12**

Source: Computed from livestock Census 2012 and District Statistical Magazine

Devi Patan

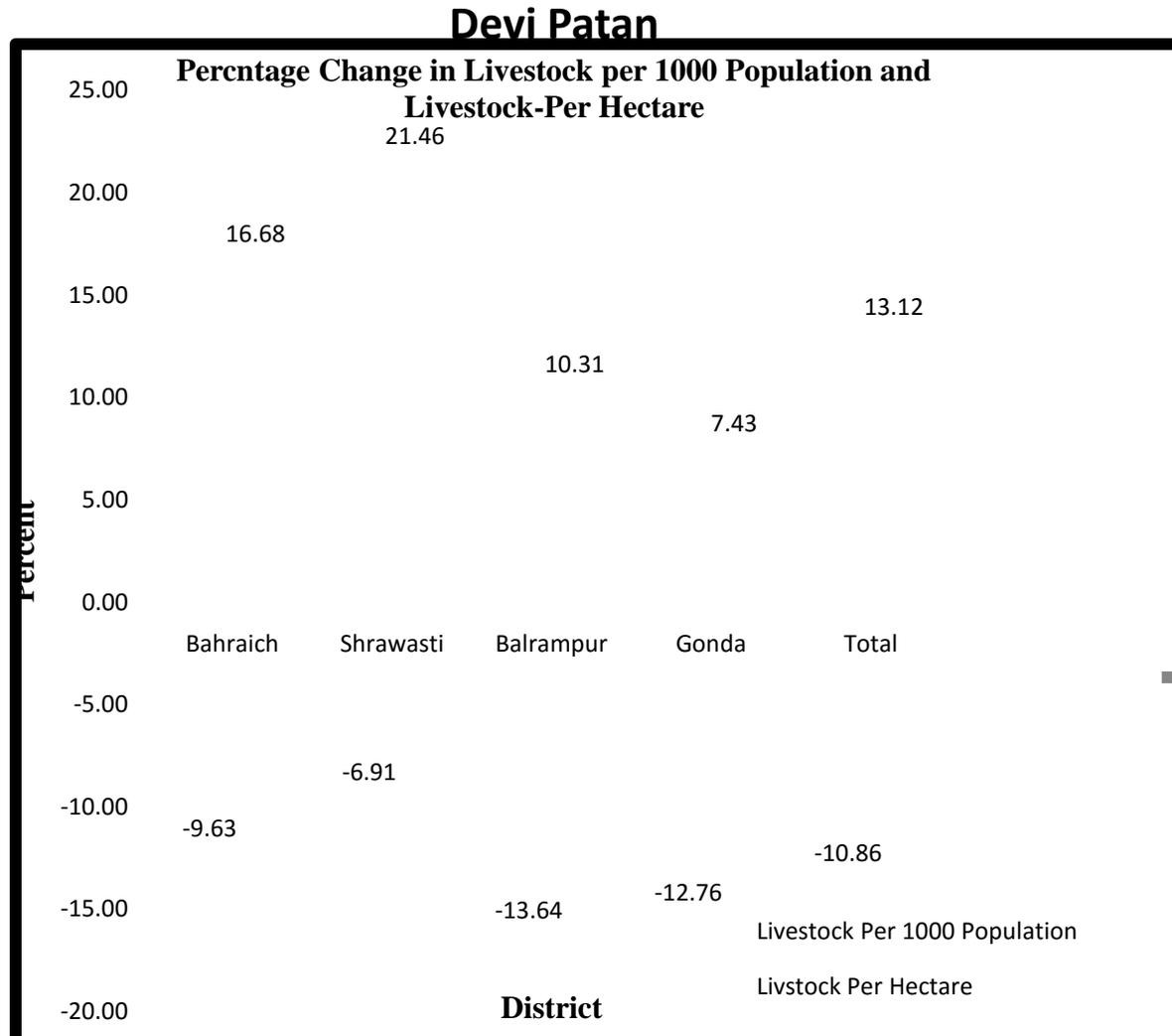**Percntage Change in Livestock per 1000 Population and Livestock-Per Hectare**

Fig. 5

Livestock husbandry in the region is practiced by more than 80 percent population of the rural areas but this sector is not developed on commercial scale. The people engaged in this activity have not fully received the benefits various government schemes and programmes initiated for the development of animal husbandry. The inaccessibility of market, lack of application of modern techniques, lack of veterinary services, shrinking of grazing lands, lack of information of latest government programmes and low socio-economic standard are the major reasons for the backwardness of livestock husbandry in the region.

Conclusion

Animal husbandry is has been part of human society especially in India since the dawn of civilization and now it has become a major income and employment providing activity simultaneously, it has been a constant source of nutrients and food products. It is contributing in the agricultural development and maintaining the environmental balance. The devi patan plain witnessed a different livestock scenario if compared with other part of the country and particularly in western Uttar Pradesh. Cattle rearing are rather more sound with cows and male cattle experienced decline but rather at low rate due to backwardness of farming .Animal husbandry along with agriculture is the base of rural economy. Buffalo and goat rearing is appearing as a boon for rural economy in the form of dairy farming and meat production Technological developments and prohibitions on cow slaughter have decreased the use of male cattle (oxen) in animal husbandry but cows, buffalo and goats have increased rapidly in the study area. Animal husbandry is providing nutrients through milk and other animal products and it also ensuring food security through meat production. Animal husbandry consumes the unproductive labour of the household so it has become an important source of livelihood generation. A proper scientific sustainable management of livestock husbandry with area, people and demand specific consideration should be designed for economically viable, socially acceptable and environmental sustainable livestock production development.

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