



**IMPORTANCE OF COMMON PROPERTY RESOURCES FOR LIVESTOCK DEVELOPMENT:
A CASE STUDY OF UTTAR PRADESH**

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ABSTRACT

Livestock play an important role in socio-economic life of the rural population of India. Livestock in India accounts for about 27 per cent of agricultural GDP and is major contributor of income, food and employment security, livelihood of the people. The study shows that distributional impact of common property resources goes in favour of land less, artisans, small and marginal households. The availability of common property resources (CPRs) such as grazing and fallow lands, ponds, rivers and forests are found to be highly supportive to the growth of livestock. The average use of green fodders per households for rearing livestock is much greater in CPRs-rich region than CPRs-poor region. Due to CPRs availability, the absolute number and variety of cattle-livestock are relatively greater in CPRs-rich region than in CPRs-poor region. From the findings of study, it can be inferred that by strengthening CPRs one can ensure the sustainable development of livestock growth in particular and the sustainable development of rural economy in general.

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INTRODUCTION

The Common Property Resource Areas where the productive CPRs are naturally develop as being identified by researchers are oceans, seas, mountains, hills, forests, rivers, sea- and river-basins, lakes, springs, rivulets, water- reservoirs, falls, rocky lands, deserts, grazing lands, fallows, ponds, tanks, social forests, and so on. The varieties of CPRs as found in rural India include products such as timbers, woods, fuel, grasses, leaves, oils, seeds, bamboos, ropes, charcoals, honey, herbals, lac, canes, fruits and vegetables, birds and animals for pet and meat, fishes, fodders, minerals, and so on [Jodha: 1986,1990; Chopra: 2001; Iyengar and Shukla: 1999; Beck and Ghosh: 2000; Dasgupta:2005; NSS Report:1999; and so on].The nature, varieties and availability of CPRs depend on the agro-climatic conditions of the regions where these resources are located and grown.

In recent years, the areas of common property resources have been recognized as productive avenues for the creation of employment-income for the rural poorer families in developing countries. The CPRs can be made as a most viable and catalytic factor for the development of rural economies. It is also felt that a sustainable growth of CPRs is necessary for maintaining ecological balance and minimizing environmental hazards, which can ensure the sustainability in the development of rural economies. On account of that, the importance of CPRs has been highlighted at the international and national levels for creating awareness among people and

governments towards their restoration and development. Presently, on the issues of CPRs, a large number of both theoretical and empirical studies are booming up.

Review of Literature

Jodha's (1986) study on CPRs in dry tropical regions spreading over seven states covering eighty villages in India revealed that the CPRs contributed significantly towards the employment and income generation for the rural poor, i.e. labour and small farms households. The important sources for CPRs were village pastures, community forest, waste lands, common threshing grounds, waste dumping places, water shade drainage, village ponds, tanks, rivers rivulets, river beds, etc. The per household per year income derived from CPRs ranged between Rs. 530/- to- Rs. 830/- in different areas. This was higher than the income generated by a number of anti- poverty programmes in the some areas. He also observed that: (a) CPRs helped individuals in saving their lands from the crops through supply of fodder and grazing space, (b) some CPRs areas like ponds, rivers and forests played an important role in augmenting the private farming system, (c) CPRs also played crucial role during the natural calamities in supporting the livelihood of the rural poor, (d) the rural inequalities generated by private based farming system were partly reduced by CPRs, (e) the poor households met 66.0 to 84.0 per cent of their fuel requirement from CPRs, and (f) CPRs also contributed to the employment and income of the rural poor. The CPRs land area and their productivity were declining in all the regions. The area of CPRs had declined by 26.0 to 30.0 per cent during the preceding three decades. Consequently, the rural poor had collectively lost a significant

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part of their source for sustenance. This loss could be compensated by the privatized CPR lands distributed among them under the guise of Land Reforms.

Arnold and Stewart's (1991) study extended to the arid and semi-arid regions, hills and forests in heavy rainfall regions and the forest belt across central India. According to their findings, CPRs in these regions constituted of minor forest products and small timbers. The poorer sections were the main beneficiaries of CPRs.

Chopra's (1997) an empirical study of 89 districts of central and western part of India revealed that (i) the decrease in the area of CPRs land had significantly negative impact on the environment, (ii) privatization of land had been done at the cost of commonly owned lands, (iii) CPRs had been encroached upon by private individuals, and (iv) there was a linkage between CPRs- degradation and migration of population from one to another region. Her model in this study suggested that discouraging migration of population from rural tracts in arid and semi-arid regions could be made possible by regeneration of forests and pasturelands, improving irrigation potential, bringing more land under common property regimes. In her another study accompanied with others (1998) on CPRs in six villages of Udaypur district of Rajasthan, she examined the nature of linkages between deforestation, land degradation and migration of population from one to another place. The main findings of this study were-(i) creation of common property rights significantly slowed down the distant migration in the long run, (ii) the ownership of cattle stock had a negative effect on distant migration, and motivated the owners to participate in protecting and conserving the common land resources such as pasture land, (iii) the participation probability in common land resources increased significantly amongst villagers who had earlier participated in common water resources, and (iv) the institutional build-up in villages played a significant role in improving participation of villagers in creation of CPRs. Again, in her further study (2002) based on secondary data, she reiterated the issues of inter-linkages between environmental degradation, rural-urban migration and poverty. According to this study, a large part of out migration, in arid and semi-arid regions, was mainly due to push factors such as environmental degradation and shrinkage of CPRs. The leadership in participation in CPRs came from the large asset-owner if a complementarity existed between his resource base and inputs provided by the newly formed CPRs –institution. Chopra's (2001) attempt to estimate CPRs in terms of land area covering 16 states in the country was remarkable. For this, she adopted the land-use statistics supplemented by data from the Agricultural censuses and from satellite imagery. According to her estimation, around 23.25% of total geographical area in India constituted the CPRs area. This figure was much greater than that of NSS 54th Round. However, her reclassification of CPRs was more comprehensive and scientific.

The findings of NSS Report (No. 452)[1999] on Common Property Resources in India revealed that CPRs included the village pastures and grazing lands, village forests and woodlots, protected and un-classed government forests, waste lands, common threshing grounds, watershed drainage, ponds and tanks, rivers, rivulets, water reservoirs, canals and irrigation channels. The estimated CPRs land areas was about 15.0 percent of the total geographical area in India. The

estimates of area of CPR land per household (0.31 ha) and average area of land owned (0.84 ha) by a household signified the importance of common property land – based agricultural economy of rural India. The CPRs played an important role in the rural economy and benefited its population in a number of ways. These contributed significantly to the private-property based farming as well as to the household enterprises, besides provided irrigation water, mulch and manure for cultivation, raw materials and common pastures for grazing. The average value of annual collection of CPRs was Rs. 693, which amounted to 3% of the average consumption expenditure of a rural household. About a half of the rural households collected some material or the other from CPRs. About 23% of the household reported of using common water resources like tanks, wells, tube wells etc. owned by a village *panchayat* or a community or provided by the government and government canals, rivers and springs, for irrigation of their lands. The fuel wood constituted a major part (58%) of the collection made from CPRs, fodder accounted for 25%, and other constituted 17%.

Beck and Ghosh (2000), from a micro level study of villages in West Bengal, concluded that the common property resources were of crucial importance to the poor in terms of sustaining their livelihood. The CPRs contributed around 12.0 per cent to the annual income of a poor household. These resources were of greater importance in the regions where there was less agricultural intensification. In West Bengal, the CPRs included varieties of items such as fuel, fodder, fish, fruit, vegetables, prawn spawn, etc. The women and girls were mainly responsible for collection of CPRs. They observed that the poor sections traditionally depending on CPRs for their livelihood were being excluded from the access to the CPRs at an distressing rate due to agricultural intensification, commoditization of CPRs, environmental degradation and rapid population growth.

Menon and Vadivelu's (2006) study on CPRs was largely based on the data of the National Sample Survey, 54th round (1999). They examined the different uses and people's dependence on CPRs across agro-climatic zones as well as across farmers with different sizes of operational land holdings, for the entire country. At All India level, among rural households, about 48.0 per cent of them were engaged in collection of CPRs. The annual household income from the CPRs collections was Rs.693. The certain categories of farmers (specially, the land-less) were highly dependent on CPRs collection. The ratio of value of CPRs collection to household consumption expenditure was 3.02 per cent at the National Level. In the state of Uttar Pradesh, it was 2.09 per cent.

Mohapatra (2006) presented a suggestive model for the optimal utilization and sustainable development of CPRs through private- public participation, on the basis of Indian experience. The involvement of local people and communities in CPRs-management was expedient in order to attribute a realistic meaning to the grass-root management system. In the light of the latest National Environmental Policies, he proposed for a decentralized organizational structure such as SCRMO, DCRMO and VCRMO at the state, district, and village levels respectively, for the management of CPRs. At the each level, the organization should include both government and private representatives, and particularly, the village level organization should, inter-alia, include *panchayat*

representatives. The functions of the village level common property resource management organization (VCRMO) were to be harmonized with that of village *Panchayats* so that the participation of the villagers and communities in CPRs management could be materialized. According to him, the managerial functions of the VCRMO should include three main aspects: (i) planning, (ii) operation and (iii) periodical assessment of resources and fixation of optimal limit for exploitation of a resource. In order to activate operational functions, the managers should take care of certain socio-economic problems of the inhabitants, which are largely associated with CPRs. These include the matter of accessibility of public to CPRs, terms and conditions for leasing of CPRs, local and community demand for CPRs, the problems of negative externalities of CPRs development, and so on. He described in detail the procedures of a periodical valuation of CPRs, the determination of the minimum reserve stock and optimal exploitation rate of a CPR, and the periodical investment requirement for a CPR.

Aim of the Study

The main Objectives of the study are to

1. Assess the common property resource land areas, the varieties of CPRs and the quality of the CPRs;
2. Study the linkage between the CPRs and livestock growth in the rural economy;
3. Investigate how the rural poor households' livelihood is linked to the CPRs base;
4. Examine the relationship between the sustainable growth of CPRs and the sustainable development of livestock and livelihoods;

Methodology Used

The present study is mainly based on primary data collected through purposive sampling up to village level and census at household level. On the basis of secondary data (Table-1), the State-Uttar Pradesh is divided into three agro-climatic zones. Again, the districts in each zone are further classified into two regions: CPRs-rich region and CPRs –poor region. As stated later, the national average percentage of CPRs land area is taken as a cut-off point for dividing the districts into CPRs -rich and CPRs-poor region. The districts whose average percentage of CPRs land area is below the national average are classified under CPRs-poor region and the districts whose average percentage of CPRs land area is above the national average are classified under CPRs –rich region. We selected all three agro climatic zone for our field survey. Three districts namely Mirzapur, Khiri and Chitrakoot was chosen from CPRs-rich districts in which the proportion of CPRs-land area to geographical area constituted above the national average and another three districts namely Sant Ravidas Nagar, Hamirpur and Fatehpur from CPRs-poor districts in which the average percentage of CPRs land area constituted below the national average. In each sample districts, we selected sample block and village on the basis of the proportion of CPRs land area and availability of CPRs therefrom. For this purpose, a pilot survey was conducted. Sample villages in each selected block were chosen randomly. By that process, three Villages Panchyats namely Baghoda, Barotha and Bagrehi were chosen from CPRs-rich region of UP, and Millki, Mundera and Babai Village Panchyats were chosen from CPRs-poor region. A census survey of households in all sample villages was conducted with the help of a comprehensive questionnaire.

Table 1 CPRs- Rich and CPRs- Poor Districts in Uttar Pradesh (2006-07)

Sl.No	A-C Zone	CPRs-Region*	Number of Districts	Name of districts	Average % of CPRs land area
1	MG (27)	CPRs-Rich Region	6	Bahraich, Balrampur, Maharajganj, Mirzapur, Sonbhadra, Chandauli, Azamgarh, Ballia, Shrivasti, Barabanki, Basti, Sant Kabir Nagar, Deoria, Faizabad, Ambedkar Nagar, Ghazipur, Gonda, Gorakhpur, Jaunpur, Kushi nagar, Mau, Pratnagar, Sidharth Nagar, Varanasi, Sant Ravidas Nagar, Allahabad, Kaushambi	33.38
		CPRs-Poor Region	21		5.67
2	TG (38)	CPRs-Rich Region	4	Etawah, Pilibhit, Kheri, Lucknow	20.63
		CPRs-Poor Region	34	Agra, Aligarh, Bareilly, Mahamaya Nagar, Bijnor, Badaun, Bulandshahar, Etah, Oraiya, Farrukhabad, Kannauj, Fatehpur, Firozabad, Mathura, Meerut, Bagpat, Moradabad, Jyotiba Fulley Nagar, Muzaffarnagar, Raibareilly, Rampur, Saharanpur, Shahjahanpur, Sitapur, Sultanpur, Unnao, Ghaziabad, G.B. Nagar, Manpuri, Hardoi, Kanpur Dehat, Kanpur Nagar, Jalaun, Jhansi,	7.09
3	CHg (5)	CPRs-Rich Region	2	Lalitpur, Chitrakoot	21.90
		CPRs-Poor Region	3	Hamirpur, Banda, Mahoba	6.18
		CPRs-Rich Region	14	All Districts of CPRs-Rich Regions	27.21
State Level	CPRs-Poor Region	56	All Districts of CPRs-Poor Regions	6.58	
All CPRs Regions			70	All Districts	10.84

Source: 1.Report of NSS 54th Round (1999) on CPRs; 2. District Statistical Abstract of U.P, 2007-08

Note-1. A-C Zone: Agro-Climatic Zone; MG: Middle Gangetic Plains; TG: Trans-Gangetic Plains; CHg: Central Plateau and Hills.

2. Figures in parentheses represent total number of districts in that A-C Zone.

*Total 70 Districts are classified into two CPRs regions-CPRs-rich and CPRs-poor regions on the basis of percentage of CPRs land area to geographical area. According the report of NSS 54th round on CPRs (1999), the national average of CPRs land area to total geographical land area was 15.0 per cent. This national average percentage of CPRs is used for dividing all districts of UP into CPRs –rich and CPRs –poor regions. That means the districts possessing CPRs land area below 15.0 percent are classified under CPRs-poor region, and the districts possessing CPRs land area above 15.0 per cent are classified under CPRs –rich region

Contribution of Livestock Sector to Indian Economy

Livestock plays an important role in the socio- economic life of India. It is a rich source of high quality foods such as milk, meat and eggs and a source for income and employment to millions of rural farmers, particularly women. With a large human population and about 250 million economically strong potential consumers, the domestic demand for these food products are increasing rapidly, the demand often exceeding the supply. As per the livestock census (1991), India had 203.1 million cattle, 83.1 million buffaloes, 50.7 million sheep, 115.3 million goats, 12.1 million pigs, 3.6 million other livestock and 400 million domesticated poultry birds. Given its potential as an alternative subsistence mechanism to crop farming, this sector has been addressed with priority not only for rural development but also because of the potential that lies in it contribution towards the economic development through its contribution to the food processing sector.

Livestock in India accounts for about 27 per cent of the Agricultural GDP and is positively egalitarian in its distribution and in ownership by women, and is a major pillar of income, food and employment security. Possessing the world's largest livestock population, India ranks first in milk production, fifth in egg production and seventh in meat production. Total livestock output has been growing at a much faster rate of 3.6 per cent per annum against only 1.1 per cent registered for the crops sub-sector during the past decade. Institutional supports and policy actions such as livestock insurance, market and price support, Livestock Feed and Fodder Corporation, Fodder Banks, Small Holder's Poultry Estates, etc. are needed towards achieving the rapid and inclusive growth. India's livestock sector is one of the largest in the world. It has 56.7% of world's buffaloes, 12.5% cattle, 20.4% small ruminants, 2.4% camel, 1.4% equine, 1.5% pigs and 3.1% poultry. In 2010-11 livestock generated outputs worth Rs 2075 billion (at 2004-05 prices) which comprised 4% of the GDP and 26% of the agricultural GDP. The total output worth was higher than the value of food grains.

Driven by the structural changes in agriculture and food consumption patterns, the utility of livestock has been undergoing a steady transformation. The non-food functions of livestock are becoming weaker. Importance of livestock as source of 'draught power' has declined considerably due to mechanization of agricultural operations and declining farm size. Use of dung manure is increasingly being replaced by chemical fertilizers. On the other hand, their importance as a source of quality food has increased. Sustained income and economic growth, a fast-growing urban population, burgeoning middle income class, changing lifestyles, increasing proportion of women in workforce, improvements in transportation and storage practices and rise of supermarkets especially in cities and towns are fuelling rapid increases in consumption of animal food products. Between 1983 and 2004, the share of animal products in the total food expenditure increased from 21.8% to 25.0% in urban areas and from 16.1% to 21.4% in rural areas. Despite significant increases in livestock production, per capita consumption of milk (69 kg) and meat (3.7 kg) in 2007 has been much lower against corresponding world averages of 85 and 40 kg.

Distribution of livestock is more equitable than that of land. In 2003, marginal farm households (≤ 1.0 h hectare of land) who comprised 48% of the rural households controlled more than half of country's cattle and buffalo and two-thirds of small animals and poultry as against 24% of land. Between 1991-92 and 2002-03 their share in land area increased by 9 percentage points and in different livestock species by 10-25 percentage points.

The agricultural sector engages about 57% of the total working population and about 73% of the rural labour force. Livestock employed 8.8% of the agricultural work force albeit it varied widely from 3% in North-Eastern states to 40-48% in Punjab and Haryana. Animal husbandry promotes gender equity. More than three-fourth of the labour demand in livestock production is met by women. The share of women employment in livestock sector is around 90% in Punjab and Haryana where dairying is a prominent activity and animals are stall-fed.

The distribution patterns of income and employment show that small farm households hold more opportunities in livestock

production. The growth in livestock sector is demand-driven, inclusive and pro-poor. Incidence of rural poverty is less in states like Punjab, Haryana, Jammu & Kashmir, Himachal Pradesh, Kerala, Gujarat, and Rajasthan where livestock accounts for a sizeable share of agricultural income as well as employment. Empirical evidence from India as well as from many other developing countries suggests that livestock development has been an important route for the poor households to escape poverty.

Livestock derive major part of their energy requirement from agricultural byproducts and residues. Hardly 5% of the cropped area is utilized to grow fodder. India is deficit in dry fodder by 11%, green fodder by 35% and concentrates feed by 28%. The common grazing lands too have been deteriorating quantitatively and qualitatively.

The pattern of rural non-farm diversification that took place is worth noting. The growing demand for milk, meat and eggs has resulted in the increased importance of livestock in the rural economy. It may also be a reflection of the programme of the distribution of cattle to landless households during the integrated rural development approach of the twenty first century.

Poultry Production

The annual growth rate is 8-10% in egg and 12-15% in the broiler industry. With the annual production of 33 billion eggs, India is the fifth world's largest egg producing country. It also produces 530 million broilers per year. Poultry provides employment to about 1.5 million people. It is estimated that by year 2010, the requirements will be 180 billion eggs and 9.1 billion kg poultry meat while the estimated production may only be around 46.2 billion eggs and 3.04 billion kg poultry meat. With rapid urbanization, and increasing demand from the present 250 million economically strong consumer market base (which is likely to go up to 350 million by year 2010), there is bright future for this industry in India.

Pig Farming in India

Commercial pig farming in India for meat production is one of the best and profitable business ideas for the Indian people. There are several highly meat producing pig breeds available around the globe. Some of those are very suitable for commercial meat production according to the weather and climate of India. A few years back, pig farming had a bad image in the society (only socially backward down-trodden class Indian people used to raise pigs since the time immemorial and they were not respectable people). But at present the scenario has changed tremendously and commercial pig farming in India is no more restricted to lower class people. Now people are conscious about the economic value of pigs like other domestic livestock animals. And higher caste, educated people also started commercial pig farming business in a modern and scientific manner. China, Russia, America, Brazil and West Germany are the world largest pig producing country. In India Uttar Pradesh is the largest pig producing state. However, here I am describing the advantages and required steps for starting commercial pig farming in India.

Advantages of Pig Farming in India

Pig farming has many advantages. Here, we are shortly describing the main advantages of starting commercial pig farming business in India.

- Pigs grow faster than any other animals. They have higher feed conversion efficiency. That means, they have a great feed to meat converting ratio. They can convert all types of inedible feeds, forages, certain grains byproduct obtained from mills, damaged feeds, meat byproducts, garbage etc. into valuable, nutritious and delicious meat.
- Pigs can eat and consume almost all types of feed including grains, damaged food, forage, fruits, vegetables, garbage, sugarcane etc. Sometimes they even eat grasses and other green plants or roots.
- Pigs become mature earlier than other animals. A sow can be bred for first time at their age of 8-9 months. They can farrow twice a year. And in each farrowing they give birth of 8-12 piglets.
- Setting up pig farming business is easy and it requires little capital/investment for building houses and buying equipment.
- The ratio of total consumable meat and total body weight is higher in pigs. We can get around 60 to 80 percent consumable meat from a live pig.
- Pig meat is also one of the most nutritious and tasty meat. It is higher in fat and energy and lower in water.
- Pig manure is a great and widely used fertilizer. You can use this manure for both crop production and in pond for fish farming purpose.
- Pig fat also has a huge demand in poultry feed, paints, soap and chemical industries. And this demand is continuously increasing.
- Pigs grow faster and have a good ROI (returns of investment) ratio. They reach slaughter age earlier compared to other animal. A pig becomes suitable for slaughtering purpose at their age of 7-9 months. Within this period they reach marketable weight of 70-100 kg.
- Pig meat has a good domestic demand. We can also earn good income by exporting pig products like bacon, ham, lard, pork, sausages etc. to the foreign countries.
- Pig farming business can be a great income opportunities for the small and landless farmers, unemployed educated or uneducated young people and for the rural women.
- In a word, commercial pig farming can be a great business idea and income source for the people and it can contribute the national income of our country highly.

Contribution of CPRs to Livestock Development in U.P.: (A case study of Middle Gangetic Plains Region of U.P.)

In rural economy, livestock is considered as an important subsidiary source for adding to a household's income. This source can contribute significantly to rural poverty alleviation. Particularly, for landless and labour households, livestock is the most viable income generating living asset. In this chapter, the attempt is made to study how CPRs play crucially in livestock economy. In all sample villages taken together, in the category of cattle, the milch animals constitute the biggest proportion. The milch animals in our survey areas include

cows, female buffalos and selected female goats. Male buffalos are included in draught animals. Per one hundred households, the absolute number of cows, buffalos, goats, draught animals and other cattle is 109, 73, 29,36 and 102 respectively. The percentage of milch animals (cows and buffaloes) is about 52.15 per cent of total cattle [Table-2]. The other types of livestock such as pigs and poultry (chicken, ducks, hens, geese, etc.) constitute 15 and 383 respectively per hundred households [Table-2]. The milch animals are mainly reared for milk production which is used for selling and personal consumption. The draught animals are mainly used in agricultural production and in transportation. The goats (mainly male goats), sheep, pigs, poultry are meant for selling in markets for price. On an average, a household can able to raise annually the income from milk selling and selling for livestock of Rs.9, 643 (around 11.0 per cent of total annual income of a household).

Comparing livestock between CPRs-rich and CPRs-poor regions, the number of various types of livestock per hundred household is greater in the former and is lower in the latter, except goats and poultry. The number of goats and poultry is higher in CPRs-poor region [Table-2]. A unique difference is found between landless and landowning households in the respect of livestock possessing. In both CPRs-rich and CPRs-poor regions, the landless households possess relatively lesser number of cattle-variety of livestock and relatively greater number of pigs and poultry livestock as compared to landowning households. This might be due to the fact that the economic distress and low affordability of landless households did not allow them to possess and rear cattle-variety of livestock such as milch cow, buffalo, etc. However, both landless and landowning categories both in CPRs-rich and CPRs-poor regions largely depend on CPRs for rearing livestock. Their dependence on CPRs for livestock is explained in Table-2.

In monetary term, a household uses various CPRs items for livestock rearing of value of Rs. 1691 annually in all sample villages taken together. The various types of CPRs are used by households for livestock. The green fodders are usually collected from common grazing and fallow lands as well as from forests. Besides, livestock particularly cows, buffalos, goats, sheep, and draught animals are freely allowed to move and graze on common land areas and forests. The value of this thing is not taken into account. For dwelling of houses and shades for livestock, various CPRs are collected and used by households. Besides those, many petty materials including herbal, medicines, which are required for livestock, are also collected from CPRs land areas. Some households personally collect CPRs themselves without any payment. Some others purchase CPRs from different persons on payment basis for the livestock. The valuation of CPRs for livestock was done for both systems.

Over all, the value of fodder collected from grazing and fallow lands is relatively higher as compared to the values of other CPRs used for livestock. The value of green fodders from forest areas is relatively lower. Next to fodders, the value of CPRs materials collected for dwelling houses and shades for animals constitutes relatively higher proportion [Table-2]. The total values of CPRs items used annually by a household for rearing livestock constitute about 17.54 per cent of annual income of a household from livestock. Between CPRs-rich and CPRs-poor regions, on an average, the value of all types of

CPRs used by a household for livestock is greater in the former than in the latter. In CPRs-rich region, the value of total CPRs used annually by a household for livestock is Rs. 2367 (19.64 per cent of livestock income) whereas in CPRs-poor region, that is Rs. 946 (13.53 per cent of livestock income) [Table-2]. This implies that a household exploits relatively more quantity of CPRs in CPRs - rich region than in CPRs-poor region, for the rearing livestock. This is due to the fact that as said earlier, a household in CPRs-rich region possesses relatively a higher number of cattle-livestock than in the CPRs-poor region. In order to feed and accommodate greater number of livestock, in CPRs-rich region, a household uses relatively larger quantity of CPRs than that in CPRs-poor region. Again, green fodders constitute the highest proportion in CPRs as used by a household for livestock in both CPRs-rich and CPRs-poor regions.

Between landless and landowning households, a household uses relatively lower quantity of CPRs in the former and relatively higher quantity of CPRs in the latter. The value of annual use of CPRs by a landless household for livestock is Rs. 1545 whereas by a landowning household for livestock is Rs. 2800 in CPRs –rich region. In CPRs-poor region, that is Rs. 823 for a landless household and Rs. 1116 for a land owning household [Table-3]. Although a landless household using CPRs for livestock rearing is lower as compared to landowning households, yet its relative importance to a landless households is greater than a landowning household. Because, the proportion of the value of the CPRs used for livestock in total livestock income is relatively higher for the landless household than the landowning households. For example, the percentage of the value of all CPRs used by a household for livestock to total livestock income is 26.30 for a landless and 18.28 for a landowning household in CPRs rich region, whereas in CPRs poor region, that is 20.95 for a landless and 9.95 for a landowning household [Table-3].

RESULTS OF ALL U.P SAMPLE SURVEY DATA

In this part, the attempt is made to study how CPRs play crucially in livestock economy in all A-C Zones of Uttar Pradesh and how these results match with study done in previous part of this paper.

In all sample villages / village panchyats taken together, in the category of cattle, the milch animals constitute the biggest proportion. The milch animals in our survey areas include cows, female buffalos and selected female goats. Male buffalos are included in draught animals. Per one hundred households, the absolute number of cows, buffalos, goats, draught animals and other cattle is 123, 82, 37,35 and 107 respectively. The percentage of milch animals (cows and buffaloes) is about 53.38 per cent of total cattle [Table-4]. The other types of livestock such as pigs and poultry (chicken, ducks, hens, geese, etc.) constitute 21 and 126 respectively per hundred households [Table-4]. The milch animals are mainly reared for milk production which is used for selling and personal consumption. The draught animals are mainly used in agricultural production and in transportation. The goats (mainly male goats), sheep, pigs, poultry are meant for selling in markets for price. On an average, a household can able to raise annually the income from milk selling and selling for livestock of Rs.12,435 (around 16.74 per cent of total annual income of a household).

Comparing livestock between CPRs-rich and CPRs-poor regions, the number of various types of livestock per hundred household is greater in the former and is lower in the latter, except goats and poultry. The number of goats and poultry is higher in CPRs-poor region [Table-4]. A unique difference is found between landless and landowning households in the respect of livestock possessing.

Table 2 Number and Types of Livestock (Per hundred households)

Region	Category	No. of Households	Cow	Buffalo	Goat	Draught Animal	Other cattle (mainly sheep)	Poultry	Pigs
CPRs Rich Region	Landless	163	76	15	11	35	1	474	54
	Landowning	308	156	130	36	78	231	117	13
	All	471	129	90	27	63	151	241	27
CPRs Poor Region	Landless	248	69	25	50	4	24	923	3
	Landowning	180	112	92	3	7	78	10	0
	All	428	87	53	30	5	47	539	2
Combined	Landless	411	72	21	35	16	15	745	24
	Landowning	488	140	116	24	52	175	78	8
	All	899	109	73	29	36	102	383	15

Source: Field Survey

Table 3 Value of CPRs used by households for Livestock (Per household in Rs. /Annual)

Region	Household Status	Fodder from grazing/ fallow land	Fodder from forest areas	Material used for housing and shading of animals	Other items used for livestock	Total value of CPRs [3+4+5+6]	Income from Livestock	% of total CPRs values to livestock income
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CPRs Rich Region	Landless (163)	972	158	290	125	1,545	5,874	26.30
	Landowning (308)	1,942	269	402	187	2,800	15,320	18.27
	All households (471)	1,606	231	364	166	2,367	12,051	19.64
CPRs Poor Region	Landless (248)	550	64	161	48	823	3,929	20.94
	Landowning (180)	760	70	229	57	1117	11214	9.95
	All households (428)	638	67	190	51	946	6,993	13.53
All	All villages (899)	1,145	153	281	111	1,691	9,643	17.54

Source: Field Survey

Note: Figures in parentheses are number of households.

Table 4 Value of CPRs used by households for Livestock between CPRs Rich and CPRs Poor Region (in Rs. per household / annum)

Region / Zone	Household status	Number of Households	Fodder from grazing/fallow land	Fodder from forest areas	Material used for housing and shading of animals	Other items used for Livestock	Total value of CPRs (4) to (7)	Income from Livestock	% of total CPRs values to Livestock income
1	2	3	4	5	6	7	8	9	10
CPRs Rich Region	Landless	39	949	128	313	113	1503	6538	22.99
	0.01-2.50	62	2445	485	486	216	3632	15803	22.98
	2.51-5.00	37	1846	160	454	193	2653	26270	10.10
	5.01 and above	12	1908	533	268	217	2926	21083	24.22
	All Land owner	111	2187	382	452	208	3229	19863	16.30
CPRs Poor Region	All Households	150	1865	316	416	183	2780	16399	16.95
	Landless	74	1100	85	249	127	1561	6282	24.85
	0.01-2.50	56	852	125	309	74	1360	10032	13.56
	2.51-5.00 (15)	15	400	0	233	63	696	11867	5.87
	5.01 and above	5	600	300	130	0	1030	13200	7.80
All	All Land owner	76	746	112	282	67	1207	10603	11.38
	All Households	150	921	99	266	97	1383	8471	16.33
	All village Panchayats	300	1393	208	341	140	2082	12435	16.74

Source: Field Survey

Table 4. A Number and type of livestock in sample households between CPRs rich and CPRs poor region

Region	A-C Zone	Category	No. of HHs	Cow	Buffalo	Goat	Draught Animal	Other Cattle	Poultry	Pigs
CPRs abundant region	All A-C Zone (MG+TG+CHg)	Landless	39	30	13	9	20	1	55	16
		Landowning	111	176	126	45	80	259	31	23
		All	150	206	139	54	100	260	86	39
CPRs scanty region	All A-C Zone (MG+TG+CHg)	Landless	74	57	23	36	0	60	292	24
		Landowning	76	105	83	20	3	140	0	0
		All	150	162	106	56	3	200	292	24
Combined region	All A-C Zone (MG+TG+CHg)	Landless	113	87	36	45	20	61	347	40
		Landowning	187	281	209	65	83	399	31	23
		All	300	368	245	110	103	460	378	63

Source: Field Survey of sample households

Table 4. B Number and type of livestock between CPRs rich and CPRs poor region (per households)

Region	A-C Zone	Category	No. of HHs	Cow	Buffalo	Goat	Draught Animal	Other Cattle	Poultry	Pigs
CPRs abundant region	All A-C Zone (MG+TG+CHg)	Landless	39	0.77	0.33	0.23	0.51	0.03	1.41	0.41
		Landowning	111	1.59	1.14	0.41	0.72	2.33	0.28	0.21
		All	150	1.38	0.93	0.36	0.67	1.73	0.57	0.26
CPRs scanty region	All A-C Zone (MG+TG+CHg)	Landless	74	0.77	0.31	0.49	0.00	0.81	3.95	0.32
		Landowning	76	1.38	1.09	0.26	0.04	1.84	0.00	0.00
		All	150	1.08	0.71	0.37	0.02	0.41	1.95	0.16
Combined region	All A-C Zone (MG+TG+CHg)	Landless	113	0.77	0.32	0.40	0.18	0.54	3.07	0.35
		Landowning	187	1.50	1.12	0.35	0.44	2.13	0.17	0.12
		All	300	1.23	0.82	0.37	0.35	1.07	1.26	0.21

Source: Field Survey

Table 5 Number and type of livestock (per hundred households)

Region	Zone	Category	No. of HHs	Cow	Buffalo	Goat	Draught animal	Other cattle	Poultry	Pigs
CPRs rich region	All zone [MG+TG+CHg]	Landless	39	77	33	23	51	3	141	41
		Land owning	111	159	114	41	72	233	28	21
		All	150	138	93	36	67	173	57	26
CPRs poor region	All zone [MG+TG+CHg]	Landless	74	77	31	49	0	81	395	32
		Land owning	76	138	109	26	4	184	0	0
		All	150	108	71	37	2	41	195	16
Combined both region	Combined all zone	Landless	113	77	32	40	18	54	307	35
		Land owning	187	150	112	35	44	213	17	12
		All	300	123	82	37	35	107	126	21

Source: Field Survey

In both CPRs-rich and CPRs-poor regions, the landless households possess relatively lesser number of cattle-variety of livestock and relatively greater number of pigs and poultry livestock as compared to landowning households. This might be due to the fact that the economic distress and low affordability of landless households did not allow them to possess and rear cattle-variety of livestock such as milch cow, buffalo, etc. However, both landless and landowning categories both in CPRs-rich and CPRs-poor regions largely depend on CPRs for rearing livestock. Their dependence on CPRs for livestock is explained in Table-4.

In monetary term, a household uses various CPRs items for livestock rearing of value of Rs. 2082 annually in all sample village panchayat taken together. The various types of CPRs are used by households for livestock. The green fodders are usually collected from common grazing and fallow lands as well as from forests. Besides, livestock particularly cows, buffalos, goats, sheep, and draught animals are freely allowed to move and graze on common land areas and forests. The value of this thing is not taken into account. For dwelling of houses and shades for livestock, various CPRs are collected and used by households. Besides those, many petty materials including herbal, medicines, which are required for livestock, are also collected from CPRs land areas. Some households personally collect CPRs themselves without any payment. Some others purchase CPRs from different persons on payment basis for the livestock. The valuation of CPRs for livestock was done for both systems.

Over all, the value of fodder collected from grazing and fallow lands is relatively higher as compared to the values of other CPRs used for livestock. The value of green fodders from forest areas is relatively lower. Next to fodders, the value of CPRs materials collected for dwelling houses and shades for animals constitutes relatively higher proportion [Table-4]. The total values of CPRs items used annually by a household for rearing livestock constitute about 16.74 per cent of annual income of a household from livestock. Between CPRs-rich and CPRs-poor regions, on an average, the value of all types of CPRs used by a household for livestock is greater in the former than in the latter.

In CPRs-rich region, the value of total CPRs used annually by a household for livestock is Rs. 2780 (16.95 per cent of livestock income) whereas in CPRs-poor region, that is Rs. 1383 (16.33 per cent of livestock income) [Table-4]. This implies that a household exploits relatively more quantity of CPRs in CPRs - rich region than in CPRs-poor region, for the rearing livestock. This is due to the fact that as said earlier, a household in CPRs-rich region possesses relatively a higher number of cattle-livestock than in the CPRs-poor region. In order to feed and accommodate greater number of livestock, in CPRs-rich region, a household uses relatively larger quantity of CPRs than that in CPRs-poor region. Again, green fodders constitute the highest proportion in CPRs as used by a household for livestock in both CPRs-rich and CPRs-poor regions.

Between landless and landowning households, a household uses relatively lower quantity of CPRs in the former and relatively higher quantity of CPRs in the latter. The value of annual use of CPRs by a landless household for livestock is Rs. 1503 whereas by a landowning household for livestock is Rs. 3229 in CPRs –rich region. In CPRs-poor region, that is Rs. 1561 for a landless household and Rs. 1260 for a land owning household [Table-4A, B]. In CPRs poor region, landless households more benefit of CPRs resources than land owning households and in CPRs poor region , land owning HHs are getting more benefit than landless HHs from CPRs resources. Although a landless household using less amount of CPRs, the important findings as emerged from the above analysis can be summarized as follows:

CPRs, mainly rich grazing, fallow and forest lands where green fodder is plentifully available, can create a strong base for the livestock growth. A rural household in CPRs –rich region possesses relatively large number of livestock and accordingly, earns relatively more from livestock as compared to its counterpart in CPRs –poor region. Therefore, the dependence on CPRs for livestock is relatively much greater in CPRs –rich region than in CPRs-poor region. Livestock such as goats, sheep, pigs and poultry are relatively more crucial and viable for the landless households than the landowning households. For livestock rearing, the landless households are

more benefited from CPRs as compared to landowning households [Table-5].

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