FORUM GEOGRAFIC

Forum geografic. Studii şi cercetări de geografie şi protecţia mediului
*Volume **XIV**, Issue **1** (**June** 2015), pp. **75-83***
*http://dx.doi.org/**10.5775/fg.2067-4635.2015.179.i***

Impact of Common Land Resources in Sustainable Regional Development: a Geographical Analysis

Mohd Sadiq SALMAN[1,*]

[1] Aligarh Muslim University, Department of Geography, Aligarh, Uttar Pradesh, India
* *Corresponding author*, msadiqsalman@gmail.com

Received on <13-10-2014>, reviewed on <04-02-2015>, accepted on <18-05-2015>

Abstract

India is an agricultural country where people's livelihood is highly dependent upon their land resource. The increasing population has created immense pressure on the land resources of the country, specially the agricultural land. Due to the continuous fragmentation of land in time, the small landholdings have become economically non-viable for the poor farmers. There has been a regular increase in the agricultural inputs over the last decades. Thus, the benefits from agricultural practices have declined in time. In this situation, the marginal and small farmers in general and landless people in particular rely upon the local common land resources (CLR) to supplement their income and earning their livelihood.
The CLR, being "accessible" to all and no one having any exclusive right upon them, are generally used in various ways for economic gains. The forests provide timber, various forest products especially firewood, the pastures support the livestock and the uncultivated and barren lands are utilized for construction of houses, poultry farms and animal husbandry. Various studies have revealed that they account for up to 16 to 50 per cent of the income of landless and poor farmers respectively. Due to "open access" and rampant use, the CLR are declining all over India in general and the Indo-Gangetic Plain in particular. The present study was undertaken to analyze the dynamics of CLR in the sampled district of Uttar Pradesh in the Indo-Gangetic Plain. The study reveals that there is a considerable decline in these resources during the last decades. The detailed analysis of CLR utilization and its social correlates testifies for its role in providing economic gains and livelihood to its users. Thus, the present study reveals the significance of common land resources in sustainable regional development.

Keywords: *common land resources, landless, marginal and small farmers, sustainable development*

Rezumat. Impactul resurselor de teren comun în dezvoltarea regională durabilă: o analiză geografică

India este o ţară agricolă, viaţa locuitorilor fiind dependentă de resursele lor de teren. Creşterea demografică a creat o imensă presiune asupra resurselor de teren indiene, în mod special asupra terenurilor agricole. În condiţiile permanentei fragmentări a terenurilor de-a lungul timpului, micile proprietăţi nu mai sunt economic viabile pentru fermierii săraci. Pe parcursul ultimelor decenii s-a înregistrat o creştere regulată a consumurilor agricole. Astfel, beneficiile obţinute din activităţile agricole s-au redus în timp. În această situaţie, fermierii mici şi marginali, în general şi persoanele care nu deţin terenuri, în particular, se bazează pe resursele locale de terenuri comune (RTC) pentru a-şi suplimenta veniturile şi pentru a-şi asigura mijloacele de existenţă.
În condiţiile în care sunt „accesibile" tuturor şi nimeni nu are drepturi exclusive asupra lor, RTC sunt în general folosite în moduri diferite pentru obţinerea câştigurilor economice. Pădurile furnizează lemn pentru construcţii şi pentru foc, precum şi alte produse forestiere, păşunile susţin şeptelul, iar terenurile necultivate şi neproductive sunt folosite pentru construcţia caselor, a fermelor avicole şi în zootehnie. Diverse studii au evidenţiat faptul că acestea asigură 16 până la 50% din venitul persoanelor care nu deţin terenuri, respectiv al fermierilor săraci. Din cauza „liberului acces" şi a utilizării excesive, RTC se restrâng pe întregul teritoriu al Indiei şi, în mod particular în Câmpia Indo-Gangetică. Lucrarea de faţă a avut ca scop analiza dinamicii RTC dintr-un district situat în această câmpie, în statul Uttar Pradesh. Studiul evidenţiază declinul considerabil al acestor resurse în ultimele decenii. Analiza detaliată a utilizării RTC şi a corelaţiilor sociale dovedeşte rolul acestora în obţinerea beneficiilor economice şi a mijloacelor de trai pentru utilizatori. Astfel, lucrarea de faţă evidenţiază importanţa RTC pentru dezvoltarea regională durabilă.

Cuvinte-cheie: *resurse de teren comun, persoană fără pământ, fermieri mici şi marginali, dezvoltare durabilă*

Introduction

The Indo-Gangetic plain is one of the most densely populated regions of the country. The increasing population has resulted in the fragmentation of land into small pieces over generations. The livelihood of the people is highly dependent upon their land resource. As the population is continuously increasing there is an immense pressure on the land resources of the country, especially the agricultural land. The present scenario of agriculture in the country has resulted in increase in input costs, unfavorable government policies, problems in marketing the products and low remunerations to the famers, leading to declining profits.

The small and marginal farmers sometimes do not find agriculture as a viable economic solution for their small landholdings. Therefore, they are in need to supplement their income. Thus, they rely upon the "common resources" to supplement their income. The common land resources (CLR) are a sub-category of Common Property Resources (CPRs); they are common to all and no one has any exclusive right upon it. They are generally used by them in various ways for economic gains. The forests provide timber, the pastures support the livestock of the farmers and the uncultivated and barren lands are used for construction of houses, poultry farms and animal husbandry. The landless people obtain the maximum share of their income from these resources and are sometimes dependent

upon CLR for their livelihood. The landless, marginal and small farmers account for the major part of households in the villages of the Indo-Gangetic Plain. Thus, the common land resources have a significant role in supporting a large number of dependent households.

The CLR are declining in India, especially in the Indo-Gangetic Plain due to increasing population pressure upon the land resources, "open access", lack of government policies and rampant use. The present study was undertaken to evaluate the role of CLR in the sustainable development of its users. The studies of common property resources (CPR) and CLR have been undertaken by various scholars at national and international level since the publication of Hardin's (1968) paper *"The Tragedy of Commons".* Singh (1997) defined the CPR's as the resource owned by an identifiable group of people, regulated by social conventions and legally enforceable rules. Traditionally, the CPR include community land, community pastures, community forest, wildlife, wasteland, common dumping and threshing ground, watershed drainages, village ponds, rivers and rivulets and their banks and beds, which are regulated by social conventions and legally enforceable rules (Burger & Gochfeld, 1998).

Mohammad N., (2001) and Salman & Munir (2013) have classified the CLR in Indian Context into five categories of land use / land cover, i.e. forest, pasture and grazing land, cultivable wasteland, barren and uncultivated land and fallow lands other than current fallow. Iyengar (1989) has focused upon the poor condition of the grazing and pasture lands which are considered to be one of the important parts of the CLR. Singh (1997) has emphasized that the exploitation of the land resources in a sustainable manner is necessary to ensure food security, while Bajpai (2005) studied the features promoting wasteland and methods to reclaim them. Recently, Munir et al. (2008) have attempted to study the impact of CLR on the livelihood of landless, marginal and small farmers. Similarly, various aspects of the CLR have been studied by scholars like Berkes et.al. (1989), Rees (1990), Jodha (1992), Singh (1994), Bromley and Cernea (1996) and Singh (1995).

Aims and Objectives

The present study was undertaken with the following objectives:

1. To study the change in CLR in Allahabad district during last two decades.
2. To study the socio-economic profile of CLR users in Allahabaddistrict.
3. To understand the role of various socio-economic variables upon the dynamics of CLR utilization.

Database and Methodology

The present study is based on the primary and secondary data. The secondary data were obtained from the Statistical bulletin of Allahabad district, whereas the primary data were collected through the field survey of sampled villages. The secondary data of land use were used to study the spatial distribution of the CLR. One village was selected from each block in order to study the socio-economic profile of the users. The selection of the village was done on the basis of population (between 1,500 and 2,500 persons) and accessibility. Therefore, in total 20 villages were selected for a detailed household level field survey.

A detailed questionnaire was used for the detailed survey to collect data pertaining to the general profile and land use of the sampled village, socio-economic profile of the respondent and the knowledge, access, mode of utilization and problems pertaining to management of CLR.

The questionnaire was divided into 8 sections containing 50 questions. The total number of households covered under the study were 1563, which accounts for 25 per cent of the households. The primary data collected at village level through extensive field survey were used to analyze the socio-economic profile of the respondents, the different modes of CLR use and the other grass roots level analysis of CLR utilization with the help of 31 selected variables at village level. Finally, data were checked and processed using simple statistical techniques and GIS. The relationship between the 31 selected variables and CLR utilization was established with the help of Karl Pearson's correlation coefficient technique.

Study Area

The district of Allahabad is located between 24° 47´ N and 25° 43´ N latitudes and between 81° 31´ E to 82° 21´ E longitudes. It covers an area of 5,482 Km^2. The total rural area is 5,365 Km^2 and the urban area is 117 Km^2. This district lies in the southern part of the Uttar-Pradesh state, within the Ganga Plain adjoining the Vindhyan plateau of India. Allahabad is surrounded by Sant Ravi Das (Bhadohi) and Mirzapur districts in the east, Kaushambi in the west, Pratapgarh and Jaunpur in the north and Banda and the state of Madhya Pradesh in the south.

The river Ganga and Yamuna flow through the district. Allahabad is one of the headquarters of the 18 administrative divisions of Uttar Pradesh. The Allahabad district comprises seven *tehsils* (subdivision), twenty Community Development Blocks, 2715 villages and thirteen towns. The total population of the district during 2011 was reported to be 59, 59,798 persons. The share of rural and

Forum geografic. Studii și cercetări de geografie și protecția mediului
*Volume **XIV**, Issue **1** (**June 2015**), pp. **75-83***
*http://dx.doi.org/**10.5775/fg.2067-4635.2015.179.i***

urban population was 75.22 and 24.78 per cent, respectively. The district may be divided into three physical divisions, i.e. the Trans-Ganga or the *Gangapaar* plain, the *Doab and* Trans-Yamuna or the *Yamunapaar* tract.

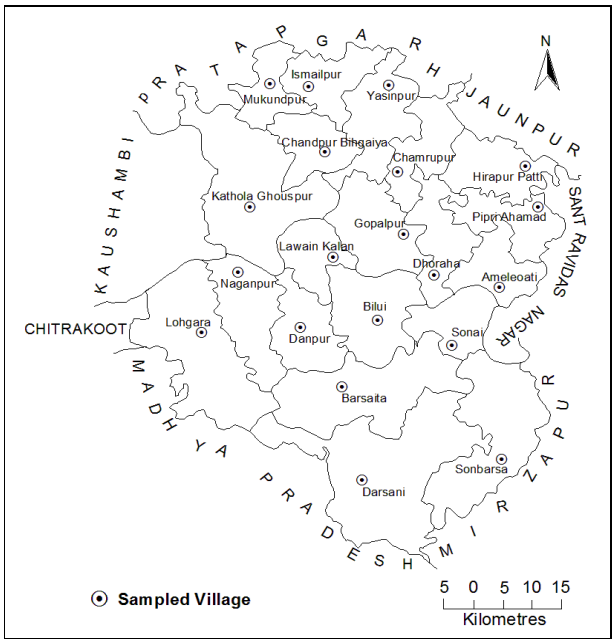

Fig. 1: Allahabad District: Location of Sampled Villages (2014)

The total reported area of the Allahabad district during 2011 was 557,014 hectares. Major part of the district lies in the fertile Ganga Plain. Thus, the largest part of the land is devoted to agriculture, but a large part of land is also used for non-agricultural purposes. The net sown area (NSA) of the district was 316,340 hectares (56.79 percent). The next major constituent share was the area under non-agricultural use (14.34 per cent) followed by present fallow land (13.40 per cent) and other fallow land (4.58 per cent), Forest (3.85 per cent), Barren and uncultivable (2.84 per cent) cultivable wasteland (2.43 per cent), area under bushes and gardens (1.48 per cent) and permanent pastures and grazing land (0.29 per cent).

Spatial-temporal Analysis of Common Land Resources

As already mentioned, in 2011, the total reported area of the Allahabad district was 557,014 hectares. The CLR include the area under forest, barren and uncultivable land, cultivable wasteland, permanent pastures and grazing land and other fallow land. Thus, the total area under the CLR during 2011 was calculated to be 13.22 per cent of the total reported area of the district. Similarly, the total area under CLR was calculated for the last two decades. Table 1 shows the temporal change in different land use categories of CLR in Allahabad district during the 1991-2011 period.

Table 1 reveals that there is an overall decline of 40.98 per cent of CLR area during the last two decades. All the CLR categories in Allahabad showed a decline during the same period, but the maximum decline is found in cultivable wasteland (52.38 per cent) followed by forest (45.55 per cent) and other fallow land (34.38 per cent). The main reason for this decline is the use of land for non agricultural purposes. The urbanization has lead to loss of agricultural land. Similarly, the Common Land Resources were also encroached or used for non-agricultural purposes.

Table 1: Temporal Change in Different Land Use Categories among Total Common Land Resources of Allahabad District (1991-2011)

S. No.	Land use Category	Area Under Different CLR Categories (in Hectares)			Change (1991-2011)	
		1991	2001	2011	Area	Percentage
1	Other Fallow Land	35561	23698	23335	-12226	-34.38
2	Forest	39400	26505	21455	-17945	-45.55
3	Cultivable Wasteland	25628	16813	12204	-13424	-52.38
4	Barren and Uncultivable Land	21822	17263	15023	-6799	-31.16
5	Permanent Pastures and Grazing Land	2392	1762	1638	-754	-31.52
Total CLR		124803	86041	73655	-51148	-40.98
CLR Share in Total Reported Area (TRA)		19.45	16.27	13.22	-	-

(data source: Statistical bulletin of Allahabad district (1991, 2001 and 2011)

Socio-economic Profile of Respondents

The Indian society gives an immense importance to the people having better socio-economic status. It has an important role in decision-making, use of resources and conflict resolution at local level. The use of CLR is also governed by the land holding, occupation, caste, availability of technology, family size and educational status of its users. Thus, these

factors not only affect the mode and intensity of utilization, but also lead to different economic benefits obtained from the CLR. The analysis of caste structure of 1563 respondents in the 20 sampled villages revealed that every village has a distinct caste composition. Table 2 shows that most of the respondents belonged to general class (43.63 per cent) followed by scheduled castes/scheduled tribes (SC/ST) (32.05 per cent) and OBC (other backward classes) (24.31 per cent). The major castes among the OBC included Dhobi, Kushwaha, Yadav, Lohar, and Teli, whereas Harijan, Chamar, Bhartiya, Madari, Paal and Mehtar were the major castes among the SC/ST.

The size of the family is an important factor in governing the economic endeavors of a person. Thus, people with large family size will not be able to provide the same economic support to every individual as those having small family size. In this scenario, the common land seems to be a good opportunity to supplement the income. Therefore, the mode and intensity of CLR utilization is also dependent upon the family size of an individual.

Table 3 shows that the overall family size of most of the respondents (62.25 per cent) falls in the medium category. Further 19.39 per cent of the respondents had large family, followed by 18.36 per cent having small family size. The presence of a large proportion of medium and large family size is an indicator of the large dependent population in the sampled villages. The increasing cost of food items and basic facilities tend to increase the burden the earners are facing for generating more income. With the continuous decline in remuneration from the agricultural activities, people turn towards other sources of income. Most of the households involve in livestock husbandry for daily income by selling milk. They generally utilize CLR for grazing their animals, storing the cow dung and providing shelter for them.

The role of education in social transformation and adoption of new ideas does not require any emphasis. The role of education is quite important with respect to CLR. The mode and intensity of utilization of a resource is highly dependent upon any individual's educational level. This indicator reveals that most of the respondents were illiterate (62.61 percent). Among the literates (37.19 per cent), those who have passed intermediate exams accounted for 11.96 per cent, followed by graduates (9.72 percent) and those who have studied up to High School (8.32 per cent). The share of respondents with higher or technical education was only 7.49 per cent (table 4).

The primary survey of 1563 households reveals that only 65.22 per cent (1026 respondents) of the households possess land, while the remaining 537 (34.36 per cent) are landless (table 5). Among the landholders, marginal farmers (less than 1 hectare of land) are the most numerous, followed by small and semi-medium farmers. The presence of large number of marginal landholders in a village is an indicator of the poor socio-economic condition of the majority of the people in general and the village as a whole. The present situation of large number of marginal land holdings in the villages of India has arisen due to continuous fragmentation of the ancestral land into the family members.

The study reveals that against the old perception that people in the villages only practice agriculture, it was found that agriculture is not the only source of their income, but rather they are also engaged into various non-agricultural activities. This change in the livelihood is due to the large number of landless people and declining benefits from agriculture coupled with the continuous increasing cost of living. Most of the people are engaged in more than one type of livelihood and have multiple sources of income.

Table 6 shows that the largest share of the respondents was found to be engaged in crop cultivation (39.35 per cent). Thus, they get their major income through crop cultivation. The next important source of income was found to be agricultural labour (18.55 per cent) followed by other sources (17.40 per cent), animal husbandry (13.12 per cent) and business/ job (11.52 per cent). Many marginal farmers have started non-agricultural activities along with the traditional agriculture on their small piece of land. Sometimes they earn more from business, animal husbandry or other occupations rather than crop cultivation. The people lying under other category are engaged in various activities like rickshaw pulling, conductor, driver, watchman, shop attendant, property dealers, contractors, shopkeepers, masons, milk collection, agricultural marketing and other petty jobs.

Table 2: Caste-wise Distribution of Respondents in Allahabad District (2012)

S. No.	Caste	Total Respondents	
		Number	Percentage
1	General	682	43.63
2	SC/ST	501	32.05
3	Other Backward Class (OBC)	380	24.31
Total Respondents		1563	100.00

(data source: Field survey, 2012)

Table 3: Distribution of Respondents on the Basis of Family Size in Allahabad District (2012)

S. No.	Family Size	Total Respondents	
		Number	Percentage
1	Small	287	18.36
2	Medium	973	62.25
3	Large	303	19.39
Total Respondents		1563	100.00

(data source: Field survey, 2012)

Table 4: Educational Status of Respondents in Allahabad District (2012)

S. No.	Educational Status	Total Respondents	
		Number	Percentage
1	Illiterate	977	62.51
2	High School	130	8.32
3	Intermediate	187	11.96
4	Graduate	152	9.72
5	Technical/Higher Education	117	7.49
Total Respondents		1563	100.00

(data source: Field survey, 2012)

Table 5: Landholding Status of Respondents in Allahabad District (2012)

S. No.	Landholding Status	Total Respondents	
		Number	Percentage
1	Large (≥ 10 Hectares)	8	0.51
2	Medium (4-10 Hectares)	21	1.34
3	Semi-Medium (2-4 Hectares)	66	4.22
4	Small (1-2 hectares)	135	8.64
5	Marginal (≤1 Hectare)	796	50.93
6	Landless	537	34.36
Total Respondents		1563	100.00

(data source: Field survey, 2012)

Table 6: Major Sources of Income of Respondents In Allahabad District (2012)

S. No.	Major Source of Income	Total Respondents	
		Number	Percentage
1	Crop Cultivation	615	39.35
2	Agricultural Labour	289	18.55
3	Animal Husbandry	205	13.12
4	Business/ Job	181	11.52
5	Other	272	17.40
Total Respondents		1563	100.00

(data source: Field survey, 2012)

Use of CLR and Economic Gains

The CLR are mostly used for grazing the livestock, agro-forestry, cultivation of crops and social forestry. They are also used as play grounds, cemeteries, cremation grounds etc. Sometimes, a single piece of "common land" is used for a number of purposes, such as playground for children, pastures, resting ground for cows or celebration grounds for various social and religious events like marriages and *Raam-leela*.

The abundance of any resource is diminished by the increasing number of users. Thus, in the case of CLR, the increase in population over time has also led to an immense competition and thereby to the degradation and depletion of these resources. The CLR are generally utilized by a large part of the rural population. The access to the CLR is sometimes limited to a certain social group of people or denied to a particular social group. Thus, the benefits of CLR can be obtained only after an individual is privileged with the access to CLR.

Table 7 reveals that 73.70 per cent of respondents were using Common Land Resources for various purposes. For the users, the share of CLR income in the total annual income varies from 4.07 per cent for the large farmers to 45.43 per cent for landless people. It can be noticed that there is an inverse relationship between the area of landholding and CLR income. Therefore, CLR income finds a significant share in the total income of landless people (45.43 percent,) followed by marginal (40.80 percent) and small farmers (23.59 percent). The large share of income from CLR is an indicator of the dependency of the landless people, marginal and small farmers upon the CLR for their livelihood and sustenance.

Table 7: Landholding Use of CLR and Share of CLR Income in Total Income of Respondents in Allahabad District (2012)

Landholding	Not Using CLR (In %)	Using CLR (In %)	Respondents Using CLR	
			Avg. Annual CLR Income/ User (In Rs.)	Share of CLR Income (%) to Total Income
Large (> 10 Hect.)	37.50	62.50	4,100.00	4.07
Medium (4-10 Hect.)	9.52	90.48	5,600.00	7.86
Semi-medium (2-4 Hect.)	15.15	84.85	6,000.00	18.30
Small (1-2 Hect.)	4.44	95.56	8,650.00	23.59
Marginal (0-1 Hect.)	46.98	53.02	11,750.00	40.80
Landless	2.98	97.02	14,650.00	45.43
Total	26.30	73.70	12,300.00	-

(data source: Field survey, 2012)

Relationship between Selected Socio-Economic Variables and CLR Utilization

The role of the social structure, education, landholding status and income of the respondents determine the mode and intensity of CLR use. The caste system prevalent in the Indian society has a significant impact upon the economic activity of an individual. The family size has a direct role in the demand for food and other necessary items for sustenance. The mode of land use is also related to the size of landholding. Similarly, the sources of income are also determined by the size of landholding of an individual. All these factors have a direct or indirect relationship with the access, utilization and income from CLR in the study area.

Thus, 31 socio-economic variables (table 8) were selected at village level from the primary data obtained through field survey to analyze the dynamic nature of the factors responsible for the degree and mode of utilization of the CLR in the study area. The selected variables given in table 8 were categorized into six broad categories. Thus, for each variable, 20 observations, one from each sampled village were recorded. Table 9 gives the coefficient of correlation of the selected variables. The details of the coefficient of correlation of the individual variables are discussed as follows:

Caste Structure

Caste structure of every sampled village was found to be unique. The percentage of large families (X_6) has strong positive correlation (0.85) with the SC/ST households (X_3). The OBC households (X_2) had a positive relationship (0.85) with those who are educated up to high school (X_8), whereas general class (X_1) had a positive relationship (0.83) with those who are graduate (X_{10}). The relationship of landholding for OBC households (X_2) was found to have strong positive association with percentage of marginal (X_{14}), small (X_{15}) and semi-medium(X_{16}) landholders at 0.68, 0.73 and 0.60, respectively. The sources of income from other sources (X_{23}) is positively correlated with X_1 and X_2. There is a relationship between X_2 and income from business (X_{20}) and animal husbandry (X_{21}). Thus, we find that the agriculture is mainly preferred by OBC and SC/ST households, whereas the other sources of income are found for the general class. The OBC households were found to be involved in animal husbandry and business. This is an indicator of declining agricultural benefits, leading to diversification of livelihoods in the study area.

The number of households using CLR (X_{24}) has strong relationship between X_{24} and X_2 at 0.82. This shows that the maximum use of the CLR is undertaken by the OBC and SC/ST households. It was found that use of CLR for other uses (X_{29}) was strongly correlated positively with X_1, X_2 and X_3 at 0.85, 0.98 and 0.86. A strong positive relationship of X_2 with (X_{28}) at 0.93 and X_{26} at 0.64 was found. The SC/ST households (X_3) also showed a positive relationship with X_{28} and X_{27} at 0.86 and 0.77. The relationship between the share of CLR income and the total income of users (X_{31}) reveals that OBC households extract more benefit from CLR and thus their share of CLR income per household is higher.

Table 8: Selected Socio-economic Variables of Respondents at Village Level

Variable	Description
Caste Structure	
X_1	Percentage of General Households
X_2	Percentage of OBC Households
X_3	Percentage of SC/ST Households
Family Size	
X_4	Percentage of Small Families
X_5	Percentage of Medium Families
X_6	Percentage of Large Families
Educational Status	
X_7	Percentage of Illiterate Respondents
X_8	Percentage of Respondents Educated up to High School Level
X_9	Percentage of Respondents Educated up to Intermediate Level
X_{10}	Percentage of Respondents Educated up to Graduation Level
X_{11}	Percentage of Respondents Educated up to Higher/Technical Level
Landholding Status	
X_{12}	Percentage of Landless Households
X_{13}	Percentage of Landholders
X_{14}	Percentage of Marginal Landholders
X_{15}	Percentage of Small Landholders
X_{16}	Percentage of Semi-medium Landholders
X_{17}	Percentage of Medium Landholders
X_{18}	Percentage of Large Landholders
Main Source of Income	
X_{19}	Percentage of Households with Major Source of Income from Crop Cultivation
X_{20}	Percentage of Households with Major Source of Income from Business/Job
X_{21}	Percentage of Households with Major Source of Income from Animal Husbandry
X_{22}	Percentage of Households with Major Source of Income from Agricultural Labour
X_{23}	Percentage of Households with Other Sources of Income
CLR: Access, Utilization and Income	
X_{24}	Percentage of Households Using CLR
X_{25}	Percentage of Households Using CLR for Agro-Forestry
X_{26}	Percentage of Households Using CLR for Crop Cultivation
X_{27}	Percentage of Households Using CLR for Social-Forestry
X_{28}	Percentage of Households Using CLR for Pasture/Grazing land
X_{29}	Percentage of Households Using CLR for Other Purposes
X_{30}	Average Annual CLR Income of Household (in Rs/-)
X_{31}	Percentage Share of CLR income to Total Household Income

Table 9: Correlation Matrix of Selected Socio-economic Variables of Respondents in Sampled Villages of Allahabad District

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}	X_{22}	X_{23}	X_{24}	X_{25}	X_{26}	X_{27}	X_{28}	X_{29}	X_{30}	X_{31}
X_1	1.00																													
X_2	0.00	1.00																												
X_3	0.00	0.93	1.00																											
X_4	0.05	0.28	0.14	1.00																										
X_5	0.08	0.23	0.28	0.00	1.00																									
X_6	0.48	0.39	0.85	0.17	0.00	1.00																								
X_7	0.05	0.25	0.17	0.64	0.47	0.46	1.00																							
X_8	0.57	0.85	0.47	0.00	0.01	0.19	0.63	1.00																						
X_9	0.04	0.12	0.22	0.22	0.16	0.30	0.01	0.70	1.00																					
X_{10}	0.83	0.28	0.37	0.37	0.34	0.53	0.27	0.23	0.11	1.00																				
X_{11}	0.48	0.65	0.89	0.03	0.03	0.20	0.41	0.00	0.84	0.11	1.00																			
X_{12}	0.37	0.34	0.02	0.26	0.60	0.72	0.04	0.89	0.34	0.27	0.88	1.00																		
X_{13}	0.37	0.34	0.02	0.26	0.60	0.72	0.04	0.89	0.34	0.27	0.88	0.19	1.00																	
X_{14}	0.23	0.68	0.06	0.09	0.07	0.27	0.53	0.01	0.12	0.37	0.06	0.51	0.51	1.00																
X_{15}	0.06	0.73	0.04	0.04	0.04	0.23	0.35	0.02	0.02	0.40	0.18	0.59	0.59	0.00	1.00															
X_{16}	0.30	0.60	0.08	0.04	0.02	0.08	0.70	0.00	0.19	0.52	0.07	0.95	0.95	0.00	0.00	1.00														
X_{17}	0.53	0.32	0.88	0.33	0.20	0.27	0.46	0.93	0.72	0.77	0.17	0.14	0.14	0.39	0.87	0.86	1.00													
X_{18}	0.33	0.73	0.26	0.27	0.19	0.31	0.02	0.08	0.11	0.84	0.05	0.77	0.77	0.29	0.23	0.17	0.41	1.00												
X_{19}	0.25	0.80	0.40	0.17	0.22	0.59	0.69	0.92	0.97	0.82	0.78	0.54	0.54	0.55	0.22	0.77	0.50	0.96	1.00											
X_{20}	0.38	0.68	0.34	0.11	0.06	0.17	0.53	0.50	0.78	0.81	0.94	0.20	0.20	0.67	0.42	0.23	0.04	0.40	0.21	1.00										
X_{21}	0.17	0.62	0.08	0.44	0.67	0.87	0.81	0.38	0.33	0.36	0.51	0.94	0.94	0.75	0.63	0.24	0.07	0.57	0.03	0.53	1.00									
X_{22}	0.09	0.38	0.27	0.85	0.88	0.97	0.02	0.20	0.28	0.17	0.45	0.17	0.17	0.77	0.82	0.61	0.55	0.85	0.01	0.51	0.85	1.00								
X_{23}	0.58	0.58	0.22	0.05	0.29	0.75	0.07	0.00	0.88	0.49	0.37	0.90	0.90	0.10	0.06	0.05	0.31	0.66	0.83	0.44	0.15	0.06	1.00							
X_{24}	0.83	0.82	0.57	0.59	0.20	0.10	0.37	0.11	0.34	0.72	0.35	0.79	0.79	0.04	0.15	0.00	0.75	0.33	0.02	0.48	0.01	0.47	0.42	1.00						
X_{25}	0.63	0.18	0.09	0.46	0.22	0.20	0.91	0.29	0.19	0.10	0.47	0.32	0.32	0.01	0.04	0.02	0.74	0.76	0.40	0.43	0.82	0.93	0.65	0.50	1.00					
X_{26}	0.38	0.64	0.19	0.06	0.03	0.12	0.85	0.01	0.11	0.04	0.02	0.84	0.84	0.00	0.00	0.00	0.51	0.13	0.76	0.07	0.59	0.21	0.07	0.15	0.00	1.00				
X_{27}	0.12	0.06	0.77	0.10	0.04	0.10	0.98	0.21	0.13	0.13	0.46	0.04	0.04	0.08	0.05	0.03	0.19	0.75	0.75	0.53	0.20	0.94	0.61	0.10	0.75	0.17	1.00			
X_{28}	0.85	0.93	0.86	0.48	0.29	0.29	0.32	0.64	0.26	0.01	0.81	0.67	0.67	0.63	0.75	0.68	0.66	0.87	0.45	0.33	0.34	0.93	0.49	0.23	0.04	0.28	0.48	1.00		
X_{29}	0.85	0.98	0.86	0.40	0.25	0.30	0.99	0.60	0.88	0.68	0.40	0.87	0.87	0.85	0.89	0.84	0.10	0.10	0.69	0.37	0.56	0.55	0.79	0.55	0.98	0.88	0.41	0.31	1.00	
X_{30}	0.23	0.39	0.02	0.11	0.19	0.65	0.38	0.06	0.12	0.30	0.09	0.02	0.02	0.00	0.00	0.00	0.04	0.52	0.41	0.86	0.75	0.98	0.25	0.32	0.00	0.01	0.72	0.37	0.67	1.00
X_{31}	0.52	0.40	0.11	0.34	0.38	0.69	0.60	0.08	0.37	0.33	0.08	0.08	0.08	0.00	0.00	0.00	0.01	0.94	0.99	0.38	0.67	0.63	0.39	0.10	0.01	0.06	0.56	0.74	0.84	0.00

Correlation is significant at 0.05 level (2-tailed).

Family Size

The size of family is directly related to literacy, income, expenditure, major source of income and use of Common Land Resources. The medium and large families (X_5 and X_6) were positively correlated with landless households (X_{12}) at 0.60 and 0.73 respectively. The medium size family (X_5) was positively correlated with income from animal husbandry (X_{21}) and agricultural labour (X_{22}). Furthermore, the percentage of large families (X_6) was found to have the strongest relationship with agricultural labour (X_{22}) because it is of high demand and is needed throughout the year. The average CLR income per household has a positive relationship (0.65) with the percentage of large families. Similarly, the percentage share of CLR income to total income (X_{31}) was found to be positively correlated with (X_6) at 0.69.

Literacy level

Literacy has a major impact upon the social and economic aspects of an individual. The relationship between illiterates (X_7) and marginal landholders (X_{14}) was positively correlated at 0.53. The role of literacy was found to influence the number of households using CLR. Thus, X_9 was found to be positively correlated with X_{24} at 0.72. The mode of utilizing the CLR is also governed by the literacy. Thus, the illiterates (X_7) were found to be positively correlated with agro-forestry (X_{25}), crop cultivation (X_{26}), social forestry (X_{27}) and other uses (X_{29}) at 0.91, 0.85, 0.98 and 0.99, respectively. The pastures/grazing land was found to be positively correlated with higher education (X_{11}) at 0.81, thereby indicating the preference of educated people towards practicing animal husbandry on commercial basis. The illiterates were more associated with the use of CLR. Thus, the average CLR income per household (X_{30}) and percentage share of CLR income to total income (X_{31}) were positively correlated with illiterates (X_7) at 0.37 and 0.60.

Landholding Status

The landless were also found to have a positive relationship with animal husbandry (X_{21}) and other sources of income (X_{23}) at 0.94 and 0.90. The use of CLR is a source of income for the landless people. Thus, we find a positive relationship between X_{12} and X_{24}. They were also found to be positively associated with X_{26}, X_{28} and X_{29}. The households using CLR (X_{24}) were found to be positively related with the percentage of medium landholders (X_{17}) at 0.75. Further, large landholders (X_{18}) were positively correlated with average CLR income per household (X_{30}) and percentage share of CLR income to total income (X_{31}) at 0.52 and 0.94.

Major Source of Income

The major source of income is an indicator of a person's social status and it is also responsible for the need to generate extra income for sustenance. The households having major source of income from crop cultivation (X_{19}) were positively correlated with other source of income (X_{23}) at 0.83. Thereby, it indicates the low income from crop cultivation and need for generating extra income. Furthermore, for X_{19} , the strongest relationship was found for crop cultivation (X_{26}) followed by social forestry (X_{27}) at 0.76 and 0.75 respectively. The households with the major source of income from animal husbandry (X_{21}) were positively correlated with X_{22}, X_{25}, X_{26}, X_{30} and X_{31} at 0.85, 0.82, 0.59, 0.75 and 0.67, respectively. Further on, strong positive relationship was found between X_{22} and X_{25}, X_{27} and X_{28} at 0.93, 0.94 and 0.93 levels. The use of CLR by the agricultural labourers results in economic gains through various modes, showing a strong positive relationship. Finally, it leads to more CLR income per household. Therefore, X_{22} is positively related with X_{30} (0.98) and X_{31} (0.63).

CLR: Access, Utilization and Income

The use of CLR through different modes determines the income of the users. They are interdependent upon each other. Thus, we find that there is a positive relationship between the households using CLR (X_{24}) and X_{25} and X_{29} at 0.50 and 0.55. Furthermore, the households using CLR for agro forestry (X_{25}) were also found to be positively associated with X_{27} and X_{29} at 0.75 and 0.98. This shows that with the increase in the households using CLR for agro forestry, there will be an increase in the households using CLR for social forestry and other uses also. Similarly, positive relation is seen between households using CLR for social forestry (X_{27}) and X_{28}, X_{29}, X_{30} and X_{31} at 0.48, 0.41, 0.72 and 0.56. The relationship between X_{28} and X_{31} was found to be at 0.74. Therefore, it can be stated that with the increase in the number of households using CLR for pasture/grazing land, the percentage share of CLR income to total income also increases. The relationship of X_{29} with X_{30} and X_{31} was also found to be positive at 0.87 and 0.84.This reveals that the CLR are used for other purposes by a large number of users.

Conclusion and Suggestions

The present study reveals that the socio-economic factors have a major role in the management of CLR in the study area. The caste structure being different in almost every village, it had a different role in all the sampled villages; it was found that SC/ST households were associated with large family size. Higher levels of education and landholdings was found to be correlated with general class while the OBC households were positively related to animal husbandry and the use of CLR as pasture/ grazing land. The small and medium family size was found to be related to the respondents having animal husbandry as main source of income while landless households were found to be positively correlated with percentage of large families. Further, the average CLR income per household and share of CLR income to total household income has a positive relationship with the percentage of large families.

Literacy has a noteworthy effect upon the CLR utilization. The illiterates were found to be associated with marginal landholdings, animal husbandry as main source of income and higher degree of CLR utilization. The landlesshouseholds were found to be strongly correlated with animal husbandry and utilization of CLR for pasture/grazing land. Further, strong relationship is seen between medium and large landholders and the use of CLR for agro-forestry. The households with major source of income from agricultural labourers were also found to have a positive correlation with households using CLR. Finally, it is seen that there is a positive relationship between households using CLR and the different modes of CLR utilization.A strong positive relationship is found between use of CLR for agro-forestry and social forestry. Similarly, positive relationships among households using CLR for pasture/grazing land the percentage share of CLR income to total income of the household is also observed.

The study thus reveals the economic relevance of CLR to large rural population in the study area. The sharp decline in forests in different blocks can be checked by government schemes of rural development focusing on afforestation. Similarly, wasteland can be reclaimed by social forestry, contour trenching and embankments to block the flow of water.The grazing land is declining very fast in the district. Thus, the present grazing land/pastures should be protected from over grazing by controlled/selective grazing. The quick growing shrubs, bushes and grasses along with saplings of teak, bamboo, Kikar (*Acacia nilotica*), Bahera (*Terminalia Belerica*) and oilseeds can be planted to provide fuel wood, fodder for animals and income for the local people.The increase in barren land should be checked. The barren lands can also be converted into productive assets through afforestation of trees, which require less water. The present study reveals the importance of CLR for the landless people, small and marginal farmers. These lands can be allotted to landless people for a small period of time. This will ensure proper utilization, prevention of overuse and conservation of the CLR. There is an urgent need to formulate adequate laws to check the rampant use of these resources. The

local administration should be vigilant to check the trespassers. Participatory approach to the conservation of the resources seems to be the most suitable option. The formation of Village Development Committees or Village Integrated Rural Development Committees is necessary for effective conservation and management of common resources .Thus, there is an urgent need to focus upon the conservation of CLR through different means in order to provide livelihoods and economic support to CLR users and to uphold sustainable regional development.

Acknowledgements

This research paper is a part of my doctoral work. I am highly thankful to my Supervisor Prof. Abdul Munir for his guidance throughout this research work.

References

Bajpai, M. (2005). Utilization of Wasteland in Ganga Yamuna Doab in Pandey B.W. (Eds.), Natural Resource Management, Mittal Publications, New Delhi

Burger J. & Gochfeld M. (1998). The Tragedy of the Commons: 30 Years Later, Environment, Vol. 40, No.10, pp. 26–27

Berkes, F, Feeny, D., McCay, B.J., Acheson, J.M. (1989). The Benefits of the Commons, Nature, Vol. 340, pp: 91-93

Bromley, D.W. & Cernea, M.M. (1996). The Management of Common Property Natural Resources: Some Conceptual and Operational Fallacies. World Bank Discussion Paper No. 5, Washington D.C.

District Statistical Booklet, Allahabad (1991). Department of Statistics and Economics, Directorate of Statistics and Planning, Uttar Pradesh, Vikas Bhawan, Allahabad

District Statistical Booklet, Allahabad (2001). Department of Statistics and Economics, Directorate of Statistics and Planning, Uttar Pradesh, Vikas Bhawan, Allahabad

District Statistical Booklet, Allahabad (2011). Department of Statistics and Economics, Directorate of Statistics and Planning, Uttar Pradesh, Vikas Bhawan, Allahabad

Hardin, G. (1968). The tragedy of the commons. Science, Vol.162, pp: 1243-1248

Iyengar, S. (1989). Common Property Land resources in Gujrat, Some Findings about their Size, Status, and Use, Economic and Political Weekly, Vol.24, No.25, pp:A-67 to A-77

Jodha, N.S. (1992). Rural Common Property Resources: A Missing Dimension of Development Strategies. World Bank Discussion Paper No. 169, Washington D.C.

Mohammad, N. (2001). Participatory Management of Common Land Resources in Saryupar Plain: Some issues and Problems in Misra G.P. and Bajpai B.K. (Ed.) Community Participation in Natural Resource Management, Rawat Publications, Jaipur

Munir, A., Salman, M.S. & Toufique, M. (2008). Impact of Common Land Resources on the Livelihood of Landless, Small and Marginal Farmers: A Study of Allahabad District. The Geographer, Vol.55 No.2, pp: 1-15

Rees, J. (1990). Natural Resources: Allocation, Economics and Policy, Routledge, London

Salman, M.S. & Munir, A. (2013). Common Land Resources: The Present Status and Need for Their Conservation in North India in Shahid S.A. et al. (Eds.) Developments in Soil Classification, Land Use Planning and Policy Implications, Dordrecht: Springer Publication, Netherlands, pp: 591-604

Singh, K. (1994). Managing Common Pool Resources, Oxford University Press, Delhi

Singh, K. (1997). Property Rights and Tenures in Natural Resources in (Ed.) J. Kerr, Marothia D.K., Singh K., Ramasamy C., and Bentley W.R., Natural Resource Economics: Concepts and Applications to India, New Delhi: Oxford and IBH Publications

Singh, R.B. (1995). Forest and Forestry in India: Spatial Nature, Uses and Issues of Sustainability, National Geographical Journal of India, Vol. 41, No. 1, pp: 55-67