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Levels of Development and Migration: A Geographic Interpretation of Rudraprayag District, Uttarakhand, India

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Abstract

A well planned, balanced and multi-faceted, multi level development of a region is a prerequisite of the concept of an overall development. The only one planning cannot be implemented to all over the country, because there are intra-regional and inter-regional variations in the natural and cultural personality in the whole country. Some parts of the country have mountains and plateau while some has plains. Some parts are very rich in the resource like Chota Nagpur plateau; while some is resource less like Thar Desert. Therefore, the spatio-functional factors thus happen to be very important while formulating the development plans (*Purohit, 1996*). The mountains are not good at the flat land conditions which do not attract more to the agricultural and industrial developments. There are 70.64% of marginal land holder out of total holdings and 17.77% of small land holder out of total holdings (*Mittal, 2008*). So we need to utilize the agricultural field very carefully. Thus, rural out-migration is dominant in Uttarakhand due to the negative relationship between population and regional development (*Bhandari, 2007*). Therefore the correlation between development and migration of Rudraprayag district, Uttarakhand is presented in this paper.

Keywords: Development, Migration, Geographic Interpretation.

Introduction

In the present day context, disparities are very common in the levels of development in all the regions in terms of least moderate and adequate development (*Purohit, 1986*). Some are developed, some are developing and the rest are under developed condition. The concept of development or we can say regional development is the scientific use of resources and equitable distribution of resources and their conservation (*Kumar, 2004*). The systematic arrangements of infrastructure development with full of social amenities are found in the developed regions and the high share of different economic sectors in the GDP make them economically well strong, while the same conditions are vice versa in the under developed region. Development consists of many elements in concert within an integrated social structure (*Kumar, 2004*). It affects the socio-economic structure of the region.

The development planning in India has been started from First five year plan in 1951. There was focused on the agriculture. Later on, Industries, education, poverty, unemployment and health etc. all the sectors have been touched. Today, there is going on 12th five year plan. But, it is an illusively higher truth that even with the introduction of a number and varied development programs in India, the country in general and backward areas in particular, have not tasted the fruits of development as yet due to serious reasons (*Purohit, 1986*). The socio-physical condition of the whole country is not the same. There are mountains, plateaus, plains and coastal regions. The mountains are not good at the flat land conditions which do not attract more to the agricultural and industrial developments. The only 29.3% of the total geographical area is under mountains and hills, while there is 43% area under plain region (*Khuller, 2011*). Thus the development planning must be different in each zone.

Study Area

Rudraprayag district is located in the central part of the Garhwal region. It is located from $30^010'$ N – $30^047'$N latitude and $78^045'$ E – $79^030'$ E longitude. It covers 1990 km^2 area of the ground. The altitude of the region ranges from 670 M. to 6968 M. Uttarkashi lies on the North and North-Western side, Tehri lies on the Western side, Pauri lies on the

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Southern side and Chamoli lies on the Eastern side. The almost part of the district is covered by the Mandakini River catchments. The Mandakini and its tributaries, i.e. Madhyamaheshwar River, Kali River, Lastar Gad etc. made different structures and landforms in the valley and people are living and establishing their colonies on the river terraces side by the river. The Geographical location of Rudraprayag district is presented in the Fig-1.
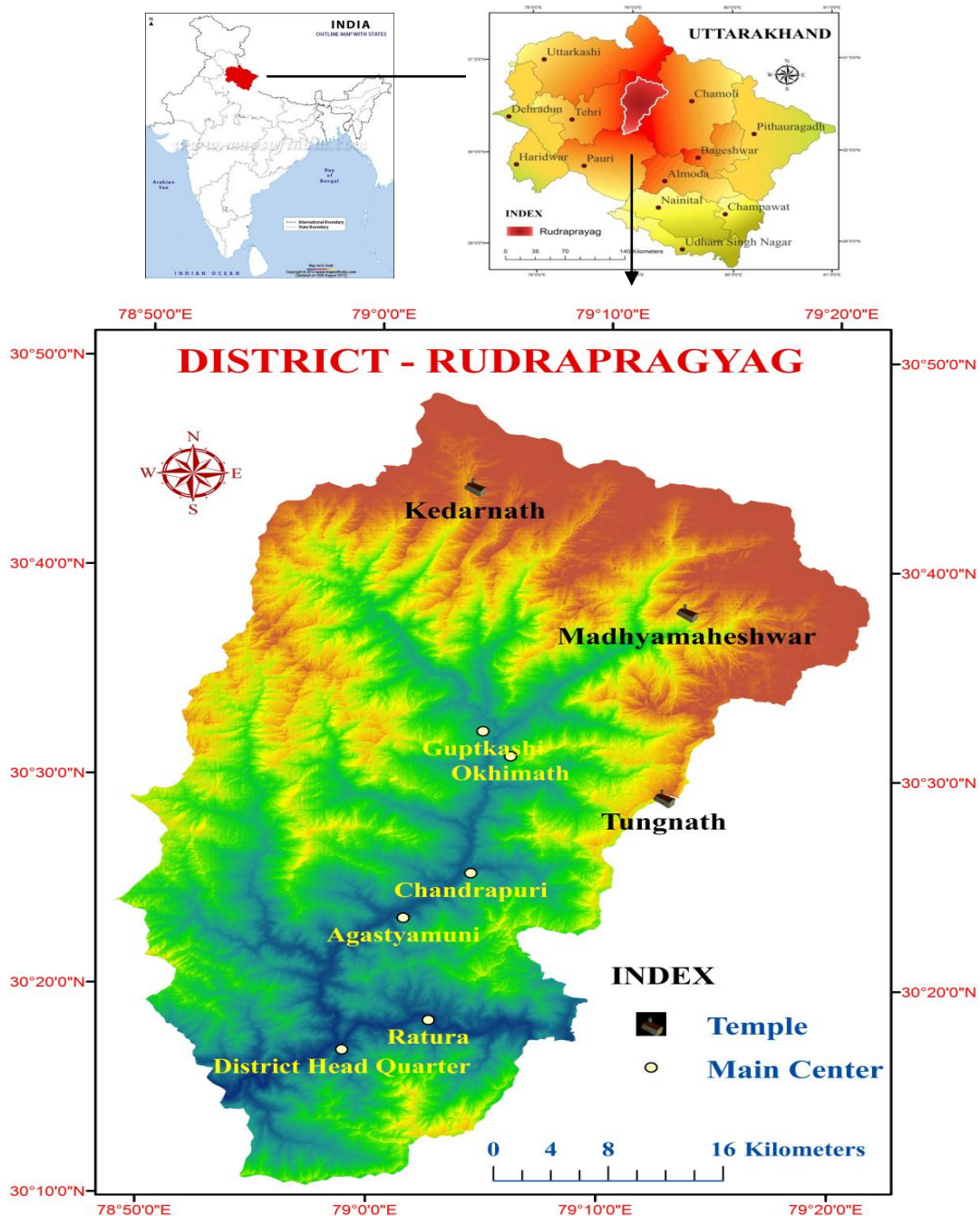
Aims of the Study

The main objective of the study is to make a comparison between the development zone and out-migration in Rudraprayag district, Uttarakhand.

Research Methodology

The present study attempts to present the comparison of the developmental zone and out-migration in Rudraprayag district. To study the development zone in Rudraprayag district, 16 villages are selected. The migration and socio-economic data were delineated using primary survey. Field survey using portable handheld Garmin Montana 650 GPS has been conducted for ground thruthing. The spatial mappings of demographic characteristics and migration conditions have been done using Arcgis 9.3 software.

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Results and Discussions

When one deals with concepts such as levels of development, it is well known that there is a number of value judgments involved (*Sita&Prabhu*, *1989*). There are selected various indicators of demographic, economic and social factors to make the levels of development of the study area, which is presented as follows –

Indicators of Socio-Economic Structure

There are selected three indicators to make the socio-economic structure of the study area. They are –

Table 1: Indicators of Socio-Economic Structure

S.No.	Demographic Indicators	Economic Indicators	Social Indicators
1	Density	Irrigated Area	Educational Institutions
2	Sex Ratio	Un-Irrigated Area	Medical facilities
3	SC Population	Cultivable Waste	Drinking Water Facilities
4	ST Population	Net Shown Area	Post Offices
5	Literacy	Income From Agriculture	Banking Facilities
6	Male Literacy	Fruit Tree Density	Commercial Banks
7	Female Literacy	Livestock Density	Road Facilities
8	Total Working Population		Distance From District Headquarter
9	Total Cultivators		Electricity Facilities
10	Total H.H. Industry Population		

All the indicators of the development, i.e. demographic, economic and social indicators are comprised with the help of ratio scale as follows -

Demographic Index

The demographic index of the study area is made by 10 demographic parameters which are described above. All the sample villages are put in the hierarchy order under each demographic parameter. Each village got the rank between of 1-16 and the aggregate score of demographic index is made by it.

The demographic index is made by using this formula–

$$Dem.I. = \frac{T.S.}{I.S.}$$

Where, Dem.I. = Demographic Index
T.S.   = Total score of all units
I.S.   = Total score of individual unit

Thus, the demographic index of the study area is presented in the table 2.

Table 2: Score of Demographic Index, 2011

Villages	1	2	3	4	5	6	7	8	9	10	Total Score	Dem.I.
Balsundi	15	1	11	2	12	14	10	12	9	8	94	12.45
Baraw Talla	78	6	5	2	11	10	13	10	8	5	78	15
Temariapalla	15	5	11	2	13	13	12	14	12	8	105	11.14
Bhains Gaon	11	14	11	2	8	7	8	6	6	6	79	14.81
Dovalya	4	16	9	2	9	8	9	7	13	8	85	13.76
Jaikhanda	3	2	7	2	10	11	11	11	10	4	71	16.48
Jurani	7	13	11	2	14	11	14	16	14	8	110	10.64
Hyuna	13	15	6	2	10	9	13	13	15	7	103	11.36
Tankila	12	9	11	2	11	12	12	15	11	8	103	11.36
Kapaniya	2	11	8	2	3	2	3	3	3	8	45	26
Ghegar	1	7	3	2	1	1	1	2	2	1	21	55.71
Mathya Gaon	5	10	10	2	7	5	7	5	16	3	70	16.71
Arkhund	9	4	4	2	2	3	2	4	7	8	45	26
Dhariyaj	14	3	11	2	6	6	6	8	4	8	68	17.21
Sisau	6	12	1	1	5	4	5	9	5	8	56	20.89
Sirwadi	10	8	2	2	4	3	4	1	1	2	37	31.62
Total											1170	

Source: VD, 2011, Census of India

Economic Index

The economic index of the study area is made by 7 economic parameters which are described above. All the sample villages are put in the hierarchy order under each economic parameter. Each village got the rank between of 1-16 and the aggregate score of economic index is made by it. The economic index is made by using the following formula –

$$E.I. = \frac{T.S.}{I.S.}$$

Where,
E.I.   = Economic Index
T.S.   = Total score of all units
I.S.   = Total score of individual unit

The economic index of the study area is presented in the table 3.

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Table 3: Score of Economic Index, 2011

NAME	1	2	3	4	5	6	7	Total Score	E.I.
				Score of Economic Index					
Balsundi	16	1	10	8	10	10	7	62	15.05
Baraw Talla	16	7	12	7	9	8	8	67	13.93
Temariapalla	16	9	4	6	8	4	12	59	15.81
Bhains Gaon	16	3	8	3	11	2	8	51	18.29
Dovalya	6	10	7	8	13	13	6	63	14.81
Jaikhanda	16	11	16	9	14	4	10	80	11.66
Jurani	16	12	13	8	12	6	12	79	11.81
Hyuna	16	9	9	4	15	7	9	69	13.52
Tankila	16	8	11	5	7	11	11	69	13.52
Kapaniya	4	4	5	7	2	6	4	32	29.16
Ghegar	3	2	3	8	3	12	1	32	29.16
Mathya Gaon	16	14	16	16	5	14	5	86	10.85
Arkhund	16	15	16	16	4	9	5	81	11.52
Dhariyaj	5	5	1	1	6	1	6	25	37.32
Sisau	2	13	2	16	16	5	2	56	16.66
Sirwadi	1	6	6	2	1	3	3	22	42.41
Total								933	

Source: VD, 2011, Census of India

SOCIAL INDEX

The social index of the study area is made by 9 social parameters which are described above. All the sample villages are put in the hierarchy order under each social parameter. Each village got the rank between of 1-16 and the aggregate score of social index is made by it. The social index is made by using the following formula -

$$S.I. = \frac{T.S.}{I.S.}$$

Where,
S.I. = Social Index
T.S. = Total score of all units
I.S. = Total score of individual unit

The social index of the study area is presented in the table 4.

Table 4: Score of Social Index, 2011

VILLAGES	1	2	3	4	5	6	7	8	9	Total Score	S.I.
				Indicators of Social Inputs							
Balsundi	16	16	1	16	16	16	16	2	1	100	13.92
Baraw Talla	2	1	1	1	16	16	1	5	1	44	31.64
Temariapalla	3	16	1	16	16	16	16	11	1	96	14.5
Bhains Gaon	2	16	1	16	16	16	16	16	1	100	13.92
Dovalya	16	16	1	16	16	16	16	14	1	112	12.43
Jaikhanda	16	16	1	16	16	16	16	10	1	108	12.89
Jurani	16	16	1	16	16	16	1	4	1	87	16
Hyuna	3	16	1	16	16	16	16	3	1	88	15.82
Tankila	16	16	1	16	16	16	16	8	1	106	13.13
Kapaniya	3	2	1	16	16	16	16	9	1	80	17.4
Ghegar	1	2	1	16	16	16	16	13	1	82	16.98
Mathya Gaon	2	1	1	16	16	16	16	6	1	75	18.56
Arkhund	2	2	1	1	16	16	16	12	1	67	20.78
Dhariyaj	3	16	1	16	16	16	16	7	1	92	15.13
Sisau	2	16	1	1	16	16	16	15	1	84	16.57
Sirwadi	3	16	1	1	16	16	16	1	1	71	19.61
Total										1392	

Source: VD, 2011, Census of India

The Development of the study area is tried to measure with the help of Demographic Index (Dem.I.), Economic Index (E.I.) and Social Index (S.I.) of the study area. The aggregate scores of the entire index make the Development Index (D.I.).

$$D.I. = Dem.I. + E.I. + S.I.$$

Where, D.I. = Development Index
Dem.I. = Demographic Index
E.I. = Economic Index
S.I. = Social Index

Thus, the D.I. (Development Index) of the study area is presented in the following table 5.

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Table 5: Aggregate Score of Villages

Villages	Aggregate Score of Villages			
	Dem.I.	S.I.	E.I.	D.I.
Balsundi	12.45	13.92	15.05	41.42
Baraw Talla	15	31.64	13.93	60.56
Temariapalla	11.14	14.5	15.81	41.46
Bhains Gaon	14.81	13.92	18.29	47.02
Dovalya	13.76	12.43	14.81	41
Jaikhanda	16.48	12.89	11.66	41.03
Jurani	10.64	16	11.81	38.45
Hyuna	11.36	15.82	13.52	40.7
Tankila	11.36	13.13	13.52	38.01
Kapaniya	26	17.4	29.16	72.56
Ghengar	55.71	16.98	29.16	101.85
Mathya Gaon	16.71	18.56	10.85	46.12
Arkhund	26	20.78	11.52	58.29
Dhariyaj	17.21	15.13	37.32	69.66
Sisau	20.89	16.57	16.66	54.13
Sirwadi	31.62	19.61	42.41	93.64

Levels of Socio-Economic Development

The aggregate score makes disparities in the study area. This disparity clearly divides the study area into different levels of development zone. The scores range between a high of 101.85 for Ghengar village to a low of 38.01 for Tankila village. There is difference of 63.84 points between high and low range. The study area is divided into four levels of development. This is presented in table 6.

Table 6: Levels of Development

Levels of Development			
Aggregate Score	Category	Levels	No. of villages
80<	A	Very High	2
60-70.99	B	High	3
40-59.99	C	Medium	9
40>	D	Low	2

Table 6 reveals that maximum village of the study area are under medium development class. There are 9 villages in it. The very high class comprises 2 villages which score is more than 80 points. They are Ghengad (101.85) and Sirwadi (93.64). The lowest category which score is less than 40 points also comprises 2 villages. There are Jurani (38.45) and Tankila (38.01) villages in it. The high category class comprises 3 villages. The maximum share of the villages is of medium levels of development.

On the basis of above division, the whole study area is divided into four different levels of development (table 7).

Table 7: Levels of Development of Villages, 2011

S.No.	Villages	Nyay Panchayat	Block	D.I.	Category	Levels of Development
1	Ghengar	Dangi Bhardar	Jakholi	101.85	A	Very High
2	Sirwadi	Kot Bangar	Jakholi	93.64	A	Very High
3	Kapaniya	Bajeera	Jakholi	72.56	B	High
4	Dhariyaj	Bastabadma	Jakholi	69.66	B	High
5	Baraw Talla	Uchadhungi	Agastyamuni	60.56	B	High
6	Arkhund	Syur Bangar	Jakholi	58.29	C	Medium
7	Sisau	Kandali	Jakholi	54.13	C	Medium
8	Bhains Gaon	Saterakhal	Agastyamuni	47.02	C	Medium
9	Mathya Gaon	Syur Bangar	Jakholi	46.12	C	Medium
10	Temariapalla	Bhiri	Agastyamuni	41.46	C	Medium
11	Balsundi	Uchadhungi	Agastyamuni	41.42	C	Medium
12	Jaikhanda	Uchadhungi	Agastyamuni	41.03	C	Medium
13	Dovalya	Marora	Agastyamuni	41	C	Medium
14	Hyuna	Guptkashi	Ukhimath	40.7	C	Medium
15	Jurani	Guptkashi	Ukhimath	38.45	D	Low
16	Tankila	Ukhimath	Ukhimath	38.01	D	Low

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Very High Developed Area

There are 16 villages selected for the study. Two villages, Ghengad and Sirwadi, which come under very high category, are of Jakholi block. Their score points are more than 80. Ghengad is very large village by size and population. There are 253 household in this village. The demographic score of Ghengad is very high (55.71) among all villages. The literacy condition, total working population condition is very good in this village. The economic score of this village is 29.16 points which is third highest among all villages. The upper part of the village is Upraun condition where dry farming is focused while the lower portion is Talaun condition, where cereals are the main part of production. Sirwadi village come under remotest village of Jakholi block. It is 58 km far from district headquarter (VD, Census of India, 2011). This village got the top rank due to economic activities. Its economic index is 42.41 point which is highest among all study villages. The farmers focus on commercial agriculture. The main crops which are focused are millets (kodo, jhangora, marcha), pulses, vegetables etc. The people get 4217 rs (primary survey data) average from such products. Therefore, the people get profit here. The sex ratio of this village is 1112 (Very High). It is because of the out-migration of the male members in search of jobs. The high index of development is due to economic activities of this village.

High Developed Area

Out of three villages in high category, two are from Jakholi Block (Kapaniya and Dhariyanj) and one is from Agastyamuni Block (Baraw Talla). Kapaniya village is so much facilitated by market because it is completely attached with Jakholi market area. Therefore, the villagers sell their primary product easily. The economic index of this village is 29.16 point which is equal to Ghengad village and third highest among all villages. The maximum shares of primary product come from milk and vegetables. The average rs 2422 get each family through agriculture. The demographic index of this village is 26 point. The literacy condition of this village is very good. There are 16.7% people (primary survey data) involve in service sector. The improvement of Dhariyanj village is due to economic activity. The economic index of this village is 37.32 point, which is second highest score among all villages. Its main source of primary income is fruits. Although, the dry farming condition of this village is also very good, but the attack of wild animals always destroy their production. Therefore, the people are not taking interest in such production and only focusing on fruits and grass (primary observation). The third village is Baraw Talla. Its D.I. (Development Index) is 60.56 point which is greatly support by social index. Its Social Index is 31.64 point which is highest among all villages. There are two schools (primary & middle school), two medical centres (Ayurvedic Hospital & MCW centre) and one post office centre available. Although it is very far from block headquarter (Agastyamuni), but it is advanced by road facility. The economic condition of the village is not so good, because the total area of the village is only 29 hec^2, which is very small in comparison to other villages. Therefore, the people only focus for self-consumption rather than commercialization of agriculture.

Medium Developed Area

There are maximum villages (09) in this zone. There are 5 villages from Agastyamuni Block (Bhains Gawn, Temariapalla, Balsundi, Jaikhanda and Dovalya), 3 villages from Jakholi Block (Arkhund, Sisau and Mathya Gawn) and one is from Ukhimath Block (Hyuna) in this zone. The economic conditions in all these villages are very poor. The economic index of all the villages is less than 20 points. The average income which the people get in these villages is ≤ 1000 rs. They focus on self-consumption only. The migration in these villages is high also. There are 5 villages where the migration is ≥ 30%. Temariyaplla and Hyuna villages have maximum migration (59.4% & 59.3% respectively). The social index in these villages is not also good. There is only Arkhund village which S.I. (20.78 point) is more than 20 points.

Low Developed Area

There are only 2 villages in this zone. Both villages are from Ukhimath Block (Jurani and Tankila). The D.I. of these villages is < 40 points. The demographic, social and economic index of these villages is very poor. Both villages are very remote situated. Jurani is 46 km and Tankila is 39 km far from town area. People are involved in traditional farming which is good in the ecological point of view rather than economic condition.

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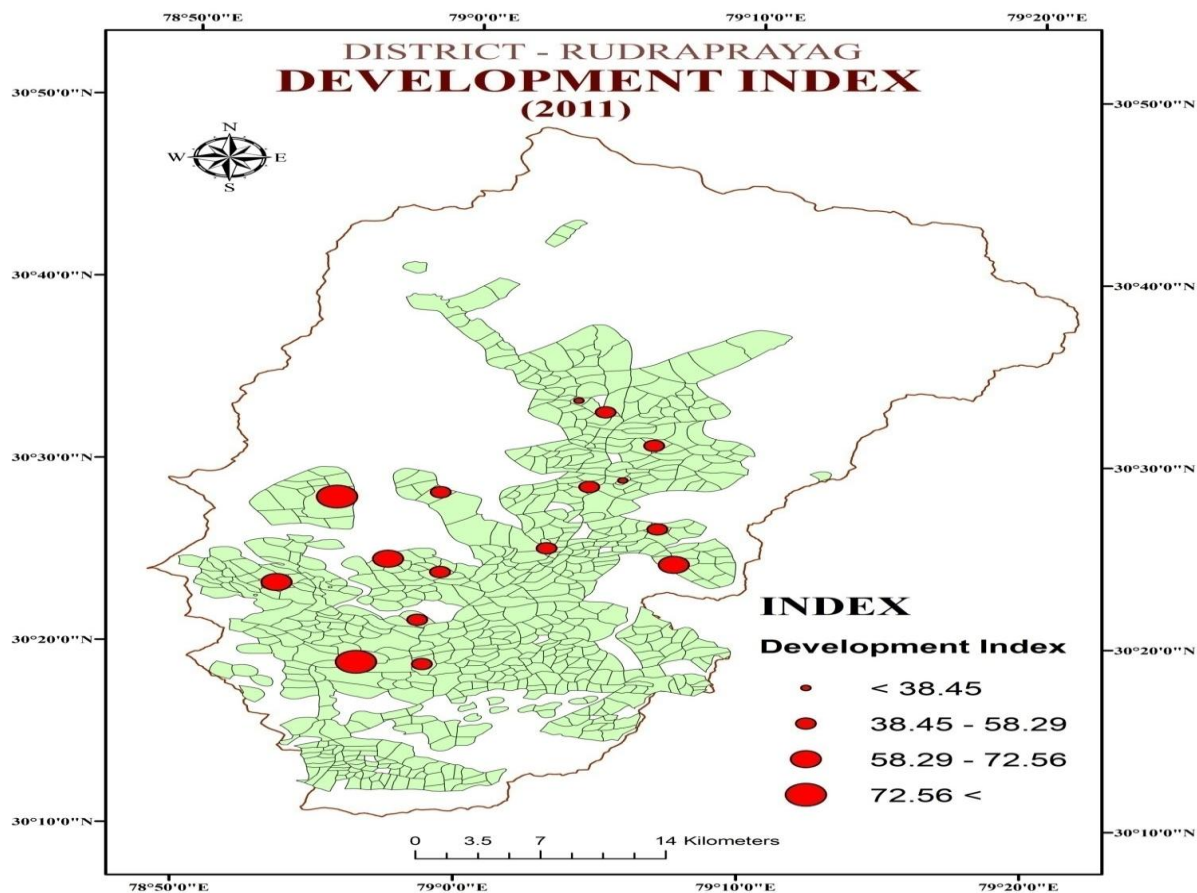
Source: Census of India Maps & Primay Survey Data, 2014

The Migration of The Sample Villages

There are selected 16 villages and the total population of these villages is 5713 and there are 34.17% population (primary survey data) is involved in migration. Only 65.82% people are still in the village. They are only the younger and older people living in the villages. The lack of primary and basic needs, i.e. education, employment, health, market etc. force people to migrate. Table 8 reveals the migration condition in the villages of the study area. The migration of the villages is dependent on the many factors i.e. the distance from the district headquarter and the altitudinal conditions etc. It also depends on the quality of the population.

Table 8: The status of Migration of the Sample villages

S.No.	Villages	Distance from road (km)	Altitude	Total Population	Out- Migration (%)	In-Migration (%)
1	Jurani	0	2000<	86	22.4	0
2	Sisau	1	>1000	508	23.05	1.1
3	Mathya	8	1000-2000	344	24.18	1.2
4	Dhariyanj	0	1000-2000	347	25.32	2.3
5	Arkhund	2	1000-2000	833	27.13	2.7
6	Bhainsgawn	2	1000-2000	285	27.4	0
7	Sirwadi	5	2000<	817	29	3.8
8	Kapaniya	0	1000-2000	568	29.12	1.9
9	Balsundi	0	1000-2000	119	30.5	2.4
10	Dovalya	1.5	>1000	98	30.6	0
11	Ghengad	0	1000-2000	1084	34.77	2.5
12	Baraw Talla	2	1000-2000	107	40.9	0
13	Jai Khanda	1	2000<	118	40.9	1.6
14	Tankila	1	1000-2000	88	42.9	3.7
15	Hyuna	0	2000<	108	59.3	0
16	Temariya Palla	3	1000-2000	81	59.4	2.6

Source: Census of India, 2011, Rurakhosh & Primary survey Data

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The above table reveals that the highest migration in Rudraprayag district is in Temariaya Palla village. The total population of this village is 81 and 59.4% population are migrated outside. Hyuna village has 108 populations and its total migration is 59.3%. Tankila has the total migration of 42.9% while its total population is 88. These villages are very far from district headquarter but is on the way to Kedarnath temple. The lowest migration (22.4%) is found in Jurani village. It is near to road side and only 10 km far from Guptakshi market place. Sisau village has also only 23.05% migration. This village is also very near to Tilwada market. Therefore, people do not shift to the market. Mathya village is the remotest among all villages. It is 8 km far from the road side. Although a kaccha road construction has been started.

Comparative Analysis of Socio-Economic Development with Migration

Table 9 shows the levels of development and both migration, i.e. out-migration and in-migration of the study area. The condition of development and migration and their rank is presented in this table. As it was assumed that the level of development affects the migration. It is tried to prove with the help of Spearman's Correlation method. The out-migration and in-migration are both correlated with the development index of the study villages. The results are presented in the table 9.

Table 9: Levels of Development and Migration of the Study Area, 2014

S.No.	Villages	D.I.	Out-Migration (%)	In-Migration (%)	D^2 (D.I. & Out-Migration)		D^2 (D.I. & In-Migration)	
1	Ghengar	101.85	34.77	0	-10	100	-2	4
2	Sirwadi	93.64	29	1.1	-5	25	-4	16
3	Kapaniya	72.56	29.12	1.2	-5	25	-4	16
4	Dhariyanj	69.66	25.32	2.3	0	0	-6	36
5	Baraw Talla	60.56	40.9	2.7	-7.5	56.25	-9	81
6	Arkhund	58.29	27.13	0	1	1	3	9
7	Sisau	54.13	23.05	3.8	5	25	-9	81
8	Bhains Gaon	47.02	27.4	1.9	2	4	-1	1
9	Mathya Gaon	46.12	24.18	2.4	6	36	-2	4
10	Temariapalla	41.46	59.4	0	-6	36	7	49
11	Balsundi	41.42	30.5	2.5	2	4	-1	1
12	Jaikhanda	41.03	40.9	0	-0.5	0.25	9	81
13	Dovalya	41	30.6	1.6	3	9	5	25
14	Hyuna	40.7	59.3	3.7	-1	1	-1	1
15	Jurani	38.45	22.4	0	14	196	12	144
16	Tankila	38.01	42.9	2.6	2	4	3	9
	Total					$\sum D^2 = 522.5$		$\sum D^2 = 558$

Source: Primary Survey Data, 2014

Rank correlation for out-migrants

$$\rho = 1 - \frac{6[\sum D^2 + 1/12(m^3-m)]}{N(N^2-1)}$$

$$\rho = 1 - \frac{6[522.5 + 1/12(2^3-2)]}{16(16^2-1)}$$

$$\rho = +0.23$$

The correlation with the out-migration and the level of development is very low. It is only +0.23. It means the present condition of the development in the villages do not satisfy too much to the villagers and is not able to fulfill their needs. The government focuses on the basic needs like water facility, road connectivity, electricity etc., but is unable to provide the employment facility. Therefore, the youngsters,

Rank correlation for in-migrants

$$\rho = 1 - \frac{6[\sum D^2 + 1/12(m^3-m)]}{N(N^2-1)}$$

$$\rho = 1 - \frac{6[558 + 1/12(5^3-5)]}{16(16^2-1)}$$

$$\rho = +0.17$$

who are willing to get the job, are forced to go outside. They might start their self-employment, but they don't have any knowledge and experience of it. They do not have other option than migrating outside.

On the other hand, if we notice the correlation of in-migration with the level of development of the villages, we do not get any optimistic results. The correlation is very low, i.e.

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+0.17. The basic reason is that the villages and the urban areas are quite different in the term of amenities. Although the government is providing the socio-economic amenities in the villages, but it is not appropriate in the comparison of urban areas. Second, when a person resides in the urban area, he makes his own society and he loves the place and people where he passes a lot of time. He becomes the habitual of more amenities and does not take interest in the villages where he has to face the problems. This is the reason, why only average 1.61% people returned back to villages after migration, while average 34.17% people are migrating outside.

Conclusion

The demographic and infrastructure parameters are in good conditions. Population is growing with time and so is the literacy rate along with the sex ratio. Similarly the infrastructure conditions are also above average. Most of the houses in villages are pucca houses with good road connectivity and availability of basic facilitates like water, electricity and toilets. However the social conditions are still improving in the area because medical and educational institutions growth has been very sluggish in the area. Further even the existing infrastructure is not in good conditions. The economic conditions in given conditions have been very marginal. Therefore, the people are migrating outside.

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