

# Asian Resonance

## Physiological Density and Production of Main Food Crops of Jammu and Kashmir Region



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### Abstract

Land is the basic of all the resources endowed by nature upon man. The relationship between man and land is so dynamic and complex as the change in one automatically influences the other. The physiographical diverse terrain of the state of Jammu and Kashmir is having less composition of agricultural land, even if the state is having a vast geographical area. The rapid increase in population has resulted the decline of man land ratio in the state. The decadal growth of population in the study region was recorded 23.81 % during 2011 whereas the increase in the arable land was 1.26 % only. It shows how the pressure of population on the arable land. In order to understand the pressure of population on the arable land, Physiological density is taken into consideration. It defines the number of persons per unit area of arable land. Physiological density helps us to know about the region's food producing capacity and the human pressure on it. It enables a geographer to know about the relationship between population and land resource. Higher the physiological density, higher would be the pressure on land. As the Population of the study region is increasing and the land resource is shrinking day by day, under such a situation, it is the need of the time to have proper planning and utilization of the land resource. The given paper aims to investigate the relationship of arable land and population, production of major food grains and to identify the changing pattern of physiological density of the state in order to have better planning for the development of the study region.

**Keywords:** Physiological Density, Growth, Pressure, Production, Planning.

### Introduction

Land resource plays a very crucial role in the development of any region or a country. In a developing country like India, Agriculture plays a determinant role as most of the country's population still engaged in this sector. It is estimated that about 57% of Indian population is dependent upon it. There is a great regional disparity in India. Some regions have sufficient production to support the existing demand but on the other hand there are also some of the regions which depend upon the production of other region. The population is increasing at a very fast rate which results a demand of land for their settlement and other infrastructural development causes diversion of agricultural land. This has a very negative impact on agricultural land as it leads to shrinkage of fertile land. Population growth has put a great pressure on the arable land resource for its intensive utilization because arable land area in the study region is limited due of its morphological structure. This leads to decrease of land man ratio. The physiological density of the study region is very high, some regions have even more than 100 persons/ha of physiological density. Higher the physiological density means higher would be the pressure on land resource. The per capita availability of land in India is higher than the study area. The per capita availability of land in India is 0.13 hectares per person where as in the study region, the per capita availability of land was 0.10 in 2001 and in 2011 it is 0.09 hectares per person. It is one of the most crucial problems in the region as it leads to increase of pressure of population on arable land.

### Study Area

The state of Jammu and Kashmir is a symbol of national integration and unity has a unique geographical identity. It is well endowed in renewable-natural resources. Its mighty rivers, evergreen forest, snow covered peaks, invigorating climate and humane population are unparallel

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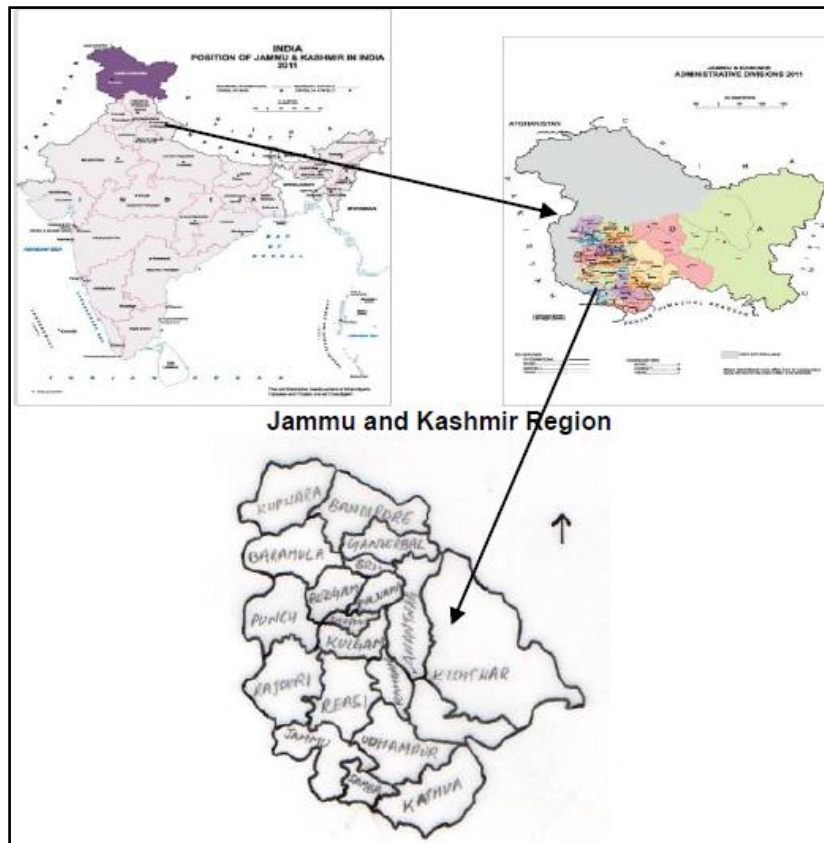
in the world. The study region comprises Jammu and Kashmir region only. It is situated between 32° 17' N to 34° 28' N latitudes and 73° 26' E to 80° 30' E longitudes.

The state of Jammu and Kashmir is the northernmost state of India and is often named as Switzerland of Asia. It consists three divisions which comprises foothill plains of Jammu, the Kashmir valley and the mountains of Ladakh. All the three regions of the state are naturally differ from one to another in topography. The state is essentially a hilly and mountainous one. It consists of outer hills, middle mountains and the great Himalayas and Karakoram. The ranges in this region are between 17000ft and 22000 ft in height. The distance from the North to south is 640km and from east to west is 480 km.

The total geographical area of the state is 2,22,236 sq.km which is 6.74% of the total area of the **Map of Study Area**

country. It has its largest portion of 76,114 sq.km area under POK, 5130sq.km handed over by Pakistan to China and 39,605 sq. Km illegally occupied by China. The state is surrounded by Tibet in the east, china and Afghanistan in the north, Pakistan in the west, Punjab and Himachal Pradesh states lies to its south respectively. As per the census of 2011, the total population of the state is 12548926 and the density is 124 persons per sq.km.

The state of Jammu and Kashmir is predominantly an agrarian economy with about 80% of its population engaged in agricultural and allied sectors. The agro climatic diversity of the state varying from sub-tropical in Jammu, temperate in Kashmir and cold arid in Ladakh make it ideal for varied cultivation.



Source: Modified from census of India, 2011

## Justification

The declining trend of man-land ratio in the country has emerged as a serious concern where land being, the basic natural resource satisfying the human needs is declining day by day. It is the land resource and the human resource, which if managed and planned properly can make immense contribution for better economic and social growth worldwide. In India where the human numbers are increasing day by day and the land which sustain the human being is shrinking, such a situation invites the serious attention of policy makers, researchers and planners to

address the issue in such a manner where we can such bible policies, measures which can help us to manage these valuable resources for the betterment of human societies. The Jammu and Kashmir region is passing through a transition phase. From last few decades, the growth of population in the concerned region has been increasing. Urbanization, infrastructural development and establishment of secondary activities are in the stage of expansion. Because of this, the area under agriculture is diverting to other purposes. All these factors cause declining in land area under agriculture. Agricultural is still the

backbone of Indian economy which is contributing immensely for providing sufficient food grains, employment and livelihood options to the people. The study of physiological density is very important and has great relevance in the present scenario as it enables us to know about the increasing burden of population on the arable land.

### Objectives

The present study aims to highlight the following objectives.

1. To examine the share of arable land in the study area.
2. To examine the production of food crops.
3. To identify the changing pattern of physiological density.

### Data Base

The present work is based on secondary information. In order to record the relevant data for the given study various government offices such as Directorate of Agriculture and Statistics, Directorate of Economics and Statistics, Ministry of Agriculture (Govt. of India), Financial commissioner Revenue (J&K) and census of Census of India (2001, 2011) have been consulted.

### Methodology

The following statistical formulations have been used in order to obtain the given objectives of the study.

1. Growth Rate =  $\frac{\text{Present value} - \text{Past value}}{\text{Past value}} \times 100$
2. Physiological Density =  $\frac{\text{The total number of population}}{\text{Area under arable land}}$
3. Average =  $\frac{\text{Sum of Observations}}{\text{Number of observations}}$

### Analysis

The table 1 reveals that the Jammu region has recorded the maximum area under the main food crops which stands at 562.12 (000 hectares) and resulting the highest production of 81.82 lakh quintals whereas the situation in Kashmir is not satisfactory as it has 251.67 (000 ha.) of area and it accounts only 44.70 lakh quintals of production during the year 2001. So far, the districts falling under the Kashmir region, the Anantnag district has recorded the highest area (62.62 ,000 ha.) accounting for 10.91 lakh quintals of production. The Srinagar district of the study region has the lowest figure of 16.72 (000 ha.) and contributing only 4.55 (lakh quintals) of production. A similar situation has been witnessed in the Jammu region where the area under the cultivation of the main food crops is highest but the production is on the lower side. The table 1 reveals that during 2001, Jammu district has the maximum area of 172.17 (000 ha.) and it has contributed only 26.01 lakh quintals of food production.

**Table-1**  
**Area and Production of Food Crops (Wheat, Maize & Paddy) in Jammu and Kashmir, 2001**

S. No.	Name of Districts in Kashmir Region	Area in ('000) Hectts. (2001)	Production of Food Grains in Lakh Quintals (2001)	S. No.	Name of Districts in Jammu Region	Area in ('000) Hectts. (2001)	Production of Food Grains in Lakh Quintals (2001)
1	Anantnag	62.625	10.91	1	Doda	29.688	2.462
2	Budgam	41.29	7.639	2	Jammu	172.173	26.012
3	Baramulla	59.935	9.378	3	Kathua	105.348	16.809
4	Kupwara	35.702	4.668	4	Poonch	41.975	7.149
5	Pulwama	35.417	7.587	5	Rajouri	105.705	15.482
6	Srinagar	16.728	4.556	6	Udhampur	110.269	13.931
	<b>Total</b>	<b>251.67</b>	<b>44.70</b>		<b>Total</b>	<b>565.12</b>	<b>81.82</b>

Source: Department of Finance Commissioner Revenue, J&k, 2001.

So far the area and production of 2011 in the study region is concerned it has also the similar trends as what has been witnessed during 2001. The table 2 shows that during 2011 the Baramulla district of the Kashmir region has the maximum area under the food crops which has been followed by Kupwara district which

stands at 41.19 (000 ha.), resulting only 5.71 lakh quintals of production. Further, the situation in Jammu region is also not satisfactory. This region also the higher proportion of areas under crops but the production is very disappointing.

**Table-2**  
**Area and production of food crops (wheat, Maize & Paddy) in Jammu and Kashmir, 2011**

S. No.	Name of Districts in Kashmir Region	Area in ('000) Hectts. (2011)	Production of Food Grains in Lakh Quintals (2011)	S. No.	Name of Districts in Jammu Region	Area in ('000) Hectts. (2011)	Production of Food Grains in Lakh Quintals (2011)
1	Srinagar	4.609	1.5755	11	Jammu	157.623	33.6535
2	Ganderbal	11.058	3.2381	12	Samba	45.842	8.6037
3	Budgam	33.622	8.7814	13	Kathua	110.516	24.1575
4	Anantnag	37.426	10.0569	14	Udhampur	76.893	14.2024
5	Kulgam	20.008	6.7928	15	Reasi	35.605	4.9324
6	Pulwama	22.858	7.3539	16	Rajouri	94.761	16.1261
7	Shopian	2.035	0.4188	17	Poonch	43.21	5.2614
8	Baramulla	42.391	9.8267	18	Doda	31.887	4.8069
9	Bandipora	14.49	4.7548	19	Kishtwar	15.802	1.9584
10	Kupwara	41.197	5.7157	20	Ramban	21.087	4.2047
	<b>Total</b>	<b>229.64</b>	<b>86.46</b>		<b>Total</b>	<b>633.19</b>	<b>117.86</b>

Source: Department of Finance Commissioner Revenue, J&k, 2011.

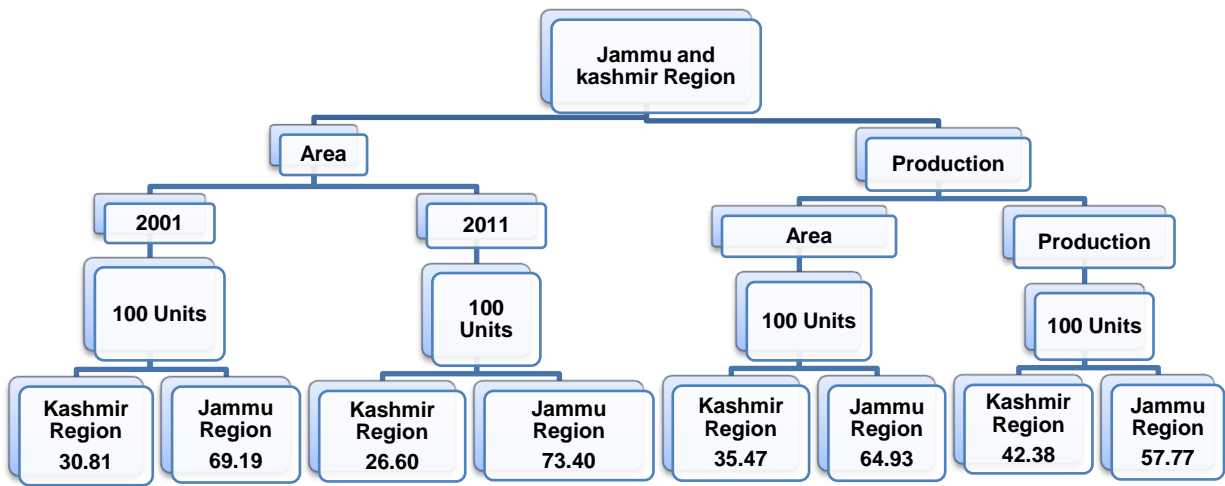
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The Jammu district has 157.62(000 ha.) of area under the main food crops and it has contributed only 33.65 lakh quintals of production. The similar situation of high area and less production of food crops have been recorded in the districts of Samba, Reasi, Poonch, Doda and Ramban under the Jammu region during 2011. The above statistics reveals that both the regions are facing the low productivity of the food grains.

However, the proportion of the arable land is higher in Jammu region as compared to Kashmir

region. It stands at 30.81% in Kashmir region and 69.19% in Jammu region during the year 2001. The Kashmir region recorded 35.47 % of production and the Jammu region has 64.93% of production during 2001. So far the area and production of main food crops are concerned both the increasing as well as the decreasing trends in case of area under main food crops has been witnessed which has declined from 30.81% to 26.60% during 2011 in Kashmir region whereas the area under the main food crops was 69.19% and has increased to 73.40%.

**Figure Shows the Composition of Area and Production of Food Grains in Jammu and Kashmir Region**

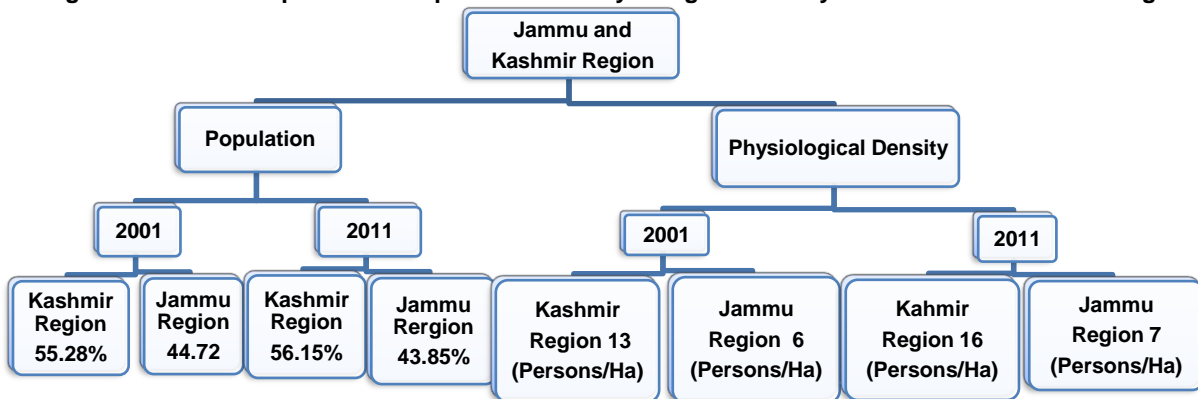


**Figure-1**

The figure 1 shows that the production of the food crops has increased from 35.47% to 42.38% in Kashmir region during 2001 and 2011 respectively.

Further a declining trend has been witnessed in production which stands at 64.93% during 2001 and 57.77% during 2011 in Jammu region.

**Figure Shows the Population Composition and Physiological Density of Kashmir and Jammu Region**



**Figure.2**

The figure 2 shows that the Kashmir region has more population in comparison to Jammu region and physiological density is also high.

**Table-3**  
Physiological density in Jammu and Kashmir

S.No.	Name of Districts in Kashmir region	Physiological Density (Per hectare), 2001	S.No.	Name of Districts in Jammu Region	Physiological Density (per hectare), 2001
1	Anantnag	11	1	Doda	8
2	Budgam	11	2	Jammu	8
3	Baramulla	13	3	Poonch	9
4	Pulwama	8	4	Rajouri	5
5	Kupwara	13	5	Kathua	4
6	Srinagar	40	6	Udhampur	6
	<b>Total</b>	<b>13</b>		<b>Total</b>	<b>6</b>

**Source: Directorate of Economics and Statistics, Census of India, 2001**

The physiological density shown in the table 3 reflects the land man relationship. The physiological density has been the highest in Srinagar district during 2001 which stands at 40 persons/ hectare and has been followed by Baramulla, Kupwara which stands at 13 persons /ha. The lowest figure of physiological density in Kashmir region has been

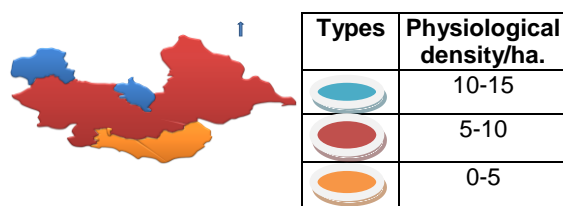
recorded in Kupwara which stands at 8 persons/ha. However, the physiological density in Jammu region is quite low. Where the Poonch district has highest physiological density of 9 persons /hectare and the minimum 4 persons /ha has been recorded in Kathua district during 2001.

**Table-4**  
Physiological density in Jammu and Kashmir

S.No.	Name of Districts in Kashmir Region	Physiological Density (Per Hectare), 2011	S.No.	Name of Districts in Jammu Region	Physiological Density (Per Hectare), 2011
1	Srinagar	121	1	Jammu	8
2	Ganderbal	16	2	Samba	5
3	Budgam	14	3	Kathua	5
4	Anantnag	15	4	Udhampur	7
5	Kulgam	11	5	Reasi	8
6	Pulwama	10	6	Rajouri	6
7	Shopian	11	7	Poonch	11
8	Baramulla	15	8	Doda	10
9	Bandipora	16	9	Kishtwar	10
10	Kupwara	18	10	Ramban	11
	<b>Total</b>	<b>16</b>		<b>Total</b>	<b>7</b>

**Source: Directorate of Economics and Statistics, Census of India, 2011**

### Physiological Density of Jammu Region, 2011

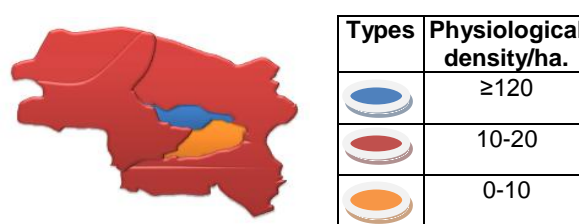


**Modified from Census Atlas of India, 2011**

Similarly, the physiological density of the study region during the year 2011 has shown the same trend.

As far as the Jammu region is concerned, it has low physiological density in comparison to Kashmir region. The maximum physiological density has been recorded as 11 persons/ha in Poonch and Ramban. Whereas the lowest physiological density in the Jammu region has been recorded as 5 persons/ha in Samba and kathua district.

### Physiological density of Kashmir Region



**Modified from Census Atlas of India, 2011**

The table 4 shows that the highest physiological density has been recorded in the Kashmir region where the land man ration is declining at a very fast rate. The maximum physiological density has been recorded in Srinagar district which stands at 125 persons/ha which is followed by kupwara at 18 persons/ha and Ganderbal at 16 persons/ha. The lowest physiological density in the Kashmir region has been recorded in Pulwama which stands at 10 persons/ha.

## Findings/ Suggestions

1. In 2001, the Jammu region has recorded the maximum area under the main food crops which stands at 562.12 (000 ha) and resulting the highest production than the Kashmir region.
2. The Anantnag district has recorded highest area of 62.62(000 ha) of land and accounts 10.91 lakh quintals of production whereas in Jammu region the highest area under the main crops has recorded in Jammu district which stands at 172.17 (000 ha) and accounts 26.01 lakh quintals of production.
3. The lowest area under the main food crops has recorded in Srinagar district having 16.72 (000 ha) of area under main food crops and produced 4.55 lakh quintals of production during the year 2001.
4. In the year 2011, Baramulla district of the Kashmir Region has the maximum area under the food crops which stands at 42.39 (000ha) and contributed 9.82 lakh quintals of production followed by Kupwara district which stands at 41.19 (000 ha) ,resulting only 5.71 lakh quintals of production.
5. The district Jammu has recorded 157.62 (000 ha) of area under main food crops but has contributed only 33.65 lakh quintals of production in the Jammu region during 2011.
6. Similar trend has been observed in the districts of Samba, Ramban under the Jammu Region in the year 2011.
7. The highest physiological density has been observed highest in the Srinagar district during 2011 which stands at 40 persons/ha followed by Baramula and Kupwara at 13 persons/ha.
8. The lowest figure in Kashmir region has been recorded in Kupwara stands at 8 persons/ha. Whereas in Jammu region the physiological density is quite low than the Kashmir region.
9. The Poonch district has recorded the highest physiological density of 9 persons/ha and the minimum density of 4 persons/ha has been recorded by Kathua district during 2001.
10. In Kashmir region during 2011, the maximum physiological density again has been recorded in the Srinagar district which stands at 125 persons/ha whereas minimum physiological density is 11 persons/ha has been recorded in Shopian and Kulgam districts.
11. In the Jammu region, the maximum physiological density has been recorded as 11 persons/ha in Poonch and Ramban districts whereas the lowest physiological density has been recorded in Samba and Kathua districts as 5 persons/ha during 2011.
12. All the above statistics shows that the pressure of population on the land resource is higher in Kashmir region as the population in the Kashmir region is increasing at a fast rate which is leading towards declining of land man ratio.
13. Out of total population of the study region, Kashmir region comprises 55.28% of population

and Jammu region accounts 44.72% of population during 2001.

14. In the year 2011, the Kashmir region accounts 56.15% of population whereas Jammu region comprises of 43.85% of population.
15. During the span of 2001-2011, the area under the main food crops has increased only 5.63% and the arable land has increased only 1.26% whereas the population growth recorded as 23.81%.
16. The area under the main food crops in Kashmir region has declined 8.75% and in the Jammu region, it has increased 12.04%. Out of total production of the main food crops in the study region, the production in Kashmir region has increased 35.47% to 42.38% whereas the Jammu region has declined its production from 64.93% to 57.77%.

## Conclusion

Therefore from the above perusal discussion it is clear that the rapid increase of population and consumption habits causes additional demand which will in turn put a great pressure on arable land. Conversion of arable land to urban development declining the amount of land available for the agricultural purposes. Urbanization leads towards the conversion of arable land for non agricultural purposes. It leads towards the conflict between agricultural and non agricultural land. The limited resource of arable in the study region is also one of the main factors of affecting the agricultural development in the state. The increasing population leads towards the amount of declining per capita arable land. Farmland now diverting for other construction purposes which also cause decline of per capita amount of arable land. It is important especially in the region like Jammu and Kashmir to have better and rational planning for management of these resources where arable land is very less in comparison to its geographical vastness. Management plans should be improved as the existing plans are very poor. For approval of any land for construction purposes or other non agricultural purposes, it should be kept in mind that it is not an arable land. Without planning and effective policy will cause decline and waste of farmland. There must be a broad vision for such a crucial issue for mitigating the effect of reduction of arable land.

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