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Geographical analysis of cropping pattern in Kashmir valley, India.

Análisis geográfico del patrón de cultivo en el valle de Cachemira, India.

Amarjeet Singh[1]*, Ferooz Ahmed Hajam[1], Rayees Ahmed[1], Pervez Ahmed[1], Harmeet Singh[2], Ruyida Khan[1]

1- Department of Geography and Regional Development, School of Earth and Environmental Sciences, University of Kashmir, Srinagar, 190 006, India.

2- Department of Geography and Disaster Management, School of Earth and Environmental Sciences, University of Kashmir, Srinagar, 190006, India.

* Author for correspondence. Email: spacetime027@gmail.com

ABSTRACT

Agriculture is the primary source of economy in Kashmir Valley, as the majority of the population, almost 70%, exists on it. Understanding the cropping patterns is crucial for the production of crops and the intensity of land usage. The Kashmir Valley is divided into three geographical zones: flood plains, Karewas, and mountains. The primary objective of this article is to analyse the variations in agricultural patterns throughout the Kashmir valley using a seven-year reference period from 2013-14 to 2018-19. The current research is based on secondary data derived from various reliable sources. The district was taken as a unit of analysis for the cropping intensity pattern in the study area. The study findings reveal that cropping patterns in Kashmir Valley have shifted dramatically during a seven-year period. Variation in elevation, soil, and climate, topography and irrigation facilities has significantly impacted agriculture methods throughout the districts of Kashmir valley. The district-level analysis reveals that Kupwara, Baramulla, Shopian and Bandipora districts have the least cropping intensity. While Anantnag, Pulwama, and Ganderbal have a high level of crop intensity. Overall, this study will be helpful in decision making and policy formulation.

Keywords: Kashmir valley, Cropping pattern, Crop Intensity, Crop diversification, Land use

RESUMEN

La agricultura es la principal fuente de economía en el valle de Cachemira, ya que la mayoría de la población, casi el 70%, vive en ella. Comprender los patrones de cultivo es crucial para la producción de cultivos y la intensidad

del uso de la tierra. El valle de Cachemira se divide en tres zonas geográficas: llanuras aluviales, Karewas y montañas. El objetivo principal de este artículo es analizar las variaciones en los patrones agrícolas en todo el valle de Cachemira utilizando un período de referencia de siete años desde 2013-14 hasta 2018-19. La investigación actual se basa en datos secundarios derivados de varias fuentes confiables. El distrito se tomó como unidad de análisis para el patrón de intensidad de cultivo en el área de estudio. Los hallazgos del estudio revelan que los patrones de cultivo en el valle de Cachemira han cambiado drásticamente durante un período de siete años. La variación en la elevación, el suelo y el clima, la topografía y las instalaciones de riego ha afectado significativamente los métodos agrícolas en todos los distritos del valle de Cachemira. El análisis a nivel de distrito revela que los distritos de Kupwara, Baramulla, Shopian y Bandipora tienen la menor intensidad de cultivo. Mientras que Anantnag, Pulwama y Ganderbal tienen un alto nivel de intensidad de cultivo. En general, este estudio será útil en la toma de decisiones y la formulación de políticas.

Palabras clave: valle de Cachemira, patrón de cultivo, intensidad de cultivo, diversificación de cultivos, uso de la tierra

INTRODUCTION

The science and art of crop cultivation, domestication of animals and raising of livestock is known as agriculture. According to Zimmerman (1915) agriculture would mean the cultivation of the land (Bhatia 1965, Chauhan 2010, Hussain 2005, Dhindsa and Shrama 1995, Koshal 2012, Panigrahy et al. 2004, Shafi 2006). As far as my understanding of land use is concerned, it involves whole management of natural environment not the mere cultivation of different crops. One of the first land-use patterns that geographers studied is the pattern of crops across agrarian geography (Shafi 2010). The different cropping pattern is shaped by numerous factors, viz; physical factors such as soil, climate, technological factors like irrigation, bettered kinds of seeds, the vacuity of diseases and factory-produced chemicals; Institutional factors like land reform, connection of effects, credit installations, price structure, procurement programs and storehouse installations and other factors like the rate of returns, agro-climatic conditions, ranch programmes, conservation programmes, and environmental regulations (Duffy 1996, Shafi 2010, Das 2004, Adhikari et al. 2005).

Cropping intensity depicts the feasibility of land for cultivation more than formerly in a time. Cropping intensity is an index of agrarian development. The high cropping intensity means that all the factors affecting crop cultivation are favorable for double or triadic cropping, while as low cropping intensity reflects the same in a contrary direction (Hussain 2010). On the other hand, cropping pattern means the proportion of area under different crop at a point of time, change in this distribution over a period of time and factors affecting this change in distribution (Mishra and Puri 2011). A cropping pattern is

a dynamic conception as it changes in time and space. The cropping pattern in a Union Territory keeps on changing from time to time with the change in affiliated factors. It is determined substantially by physical, socio-artistic and major factors. Besides technological factors have also played an important part for example HYV programmes.

In 1962-63, the IADP was introduced in the Union Territory in two sections i.e. Jammu (in Jammu division) and Anantnag (in Kashmir division). This programme encouraged the production of paddy, wheat, and sludge. The Union Territory of Jammu and Kashmir has an advanced degree of variation in its cropping pattern, crop combination and crop diversification (Das 2004). The cropping pattern of the Union Territory by and large had a subsistence in nature during the Dogra rule. Cropping pattern was largely prejudiced towards food crops with paddy, maize and wheat. Paddy, maize and wheat counting for about 73 percent of the total gross cropped area in 1938-39. The cropping pattern was reversed with the independence of the Union Territory.

After independence, the Union Territory government took certain enterprises to transfigure the traditional agriculture into ultramodern one, joint with the institutional and technological reforms thereby, liberating the agriculture of the Union Territory from the impediment of recession. During the sixties, the preface of high-yielding kinds of seeds and diseases and the provision of assured irrigation gave a boost to the product of agriculture (Singh and Dillion 2004). The impact of the cropping pattern in the Union Territory wasn't invariant due to different geomorphology and agro-climatic conditions. There was a shift of cropping pattern in favor of marketable crops which may be attributed to the development of structures, like roads, tube wells and irrigation. The technological invention also articulated the cropping pattern on the Union Territory in numerous ways. It can be asserted that after the preface of the New Agricultural Strategy, there has been a reciprocal relationship between the commercialization and cropping pattern of the Union Territory. For the sake of advanced earnings, the growers have been switched from cereal crops to non-cereals crops. The provision of fungicides, transport and cold storehouse to ensure complaint-free development and delivery of fruits played an important part in the diversion of cereals and other lands of the Union Territory (Mishra and Bhat 1994).

The rationale of the study is about he Kashmir Valley, alternatively referred to as the Vale of Kashmir, is bordered by lofty mountains on all sides. It is located in the north-western part of Himalayan region and administered by India as the union territory of Jammu and Kashmir (Hussain 2010). On the southwest, the valley is bounded by the Pir Panjal Range, while on the northeast; it is bounded by the main Himalayan range. It measures approximately 135 kilometers (84 miles) in length and 32 kilometers (20 miles) in width and is drained by the Jhelum River. Agriculture is a major human activity because it provides a significant portion of human and animal food, as well as other materials necessary to meet human needs, including the need for industrial raw materials. Agriculture is the main occupation for the people of Jammu & Kashmir & approx. 70% of the people directly or indirectly depend on agriculture and is directly linked with their livelihood. Therefore, present study is an attempt to study the changes in the cropping patterns in the Kashmir region and to map out the levels of cropping intensity in the study area. Agriculture and its allied sectors are the predominant sectors of the frugality of Jammu and Kashmir and this sector

contributed more than 31.29 percent of Gross Domestic Product (GDP) in 2007 (Economic Survey 2011-12, Agricultural Production department 2010-11, Annual report 2011-12, Economic survey 2012). This region has witnessed high position diversification of food crops, especially paddy to high-value cash crops like apples.

Pulwama which was formerly known as the largest producer of the rice in the Union territory and so-called the rice bowl of Kashmir is now among the least producers of rice (Raina 2002). The share of paddy product of the quarter in the national income of the Union Territory has revealed a diminishing trend. Farmers feel that sticking only to the water-dependent crops like paddy in times of water failure may conceivably prove non-beneficial and they're willingly shifting the cultivation of cash crops like apple, almond and walnuts (Agricultural statistics at glance 2019, Ahmed et al. 2012). Agriculture encompasses not only crop cultivation but also animal domestication, forestry, irrigation, and a variety of other diverse activities.

The valley's economy is deeply rooted in agriculture, which is the pivot around which all economic activities revolve. The economic development of Union Territory is heavily reliant on the successful cultivation of crops. The Union Territory produced 18.21 lakh quintals of food grains in 2018-19, up from 4.53 lakh quintals in 2013-14 (Agricultural statistics at glance 2019). In J&K Union Territory, the three principal crops, paddy, maize, and wheat, accounting for more than 90% of total food grain output, with the remainder made up of various cereals and pulses. In Kashmir, paddy is the primary crop, followed by maize, oilseeds, pulses, vegetables, fodder, and wheat while as, Wheat is the leading crop in the Jammu area, followed by maize, paddy, pulses, oilseeds, fodder, vegetables, and other crops.

The present study was carried out with an aim to achieve the following objectives. 1) To ascertain changes in agricultural land usage in the Kashmir region throughout seven years beginning in 2013-14 and ending in 2018-19, and 2) To conduct a crop intensity analysis in the different districts of Kashmir valley.

MATERIAL AND METHODS

Study Area: The study area has been chosen as Kashmir Valley, which is located in the country's far northwestern corner. The region is surrounded by the Himalayan ranges and exhibits the characteristics of a semi-closed ecosystem. The area is located between 30^{o} 25' N and 34^{o} 45' N latitudes and 73^{o} 55' E and 75^{o} 35' E longitudes, covering an area of 15,948 square kilometers but with revenue records covering only 5565.77 square kilometers, or just 34.90 percent of the geographical area (Figure 1). The valley is drained by Jhelum and its 24 feeding tributaries. The Valley receives 60% of its annual precipitation in the form of rain and snow during the months of December and January. The Kashmir Valley has a limited area of extension and is characterized by highly varied temperature and precipitation conditions at the mesa and micro scales. The temperature often decreases as one moves from the Valley floor to the rim region.

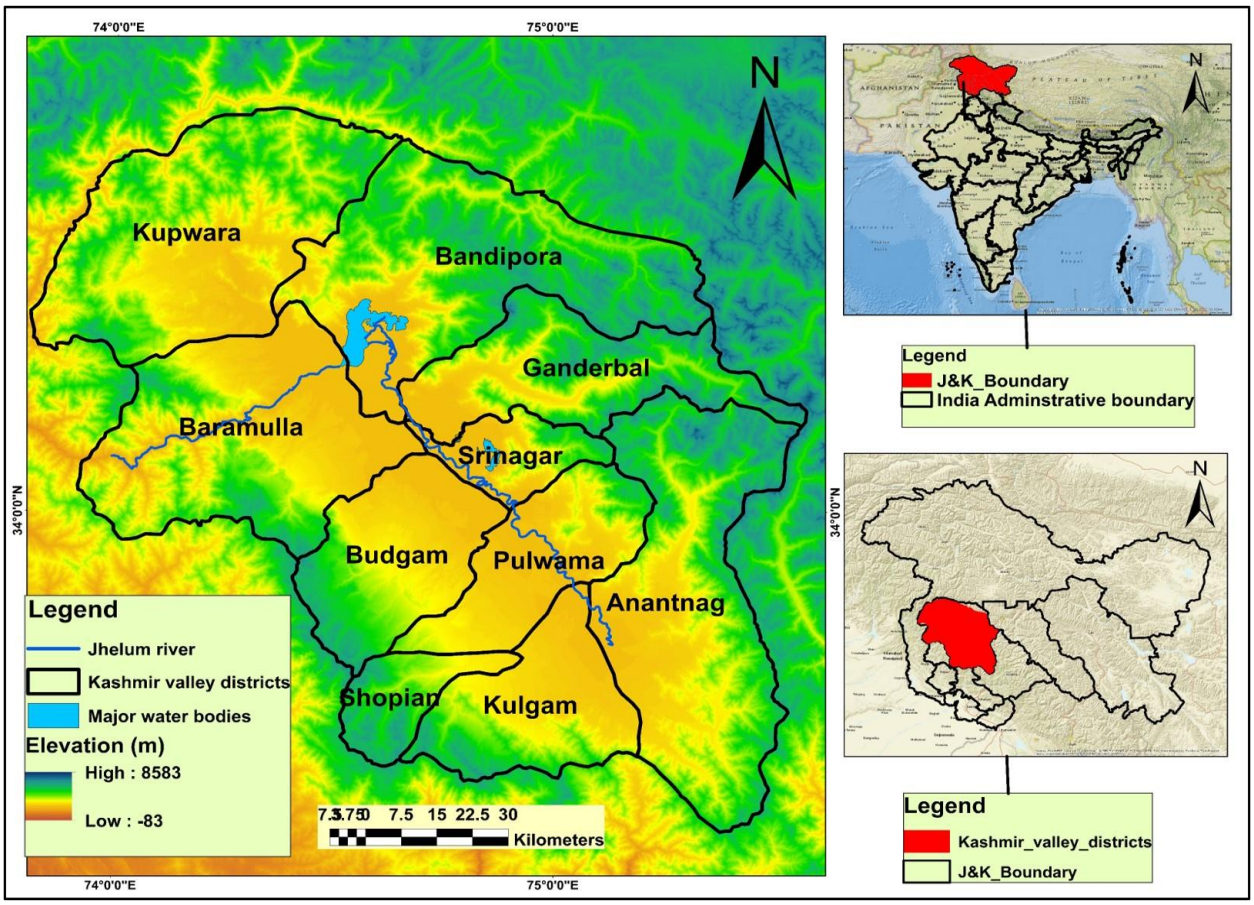

Figure 1: Location map of study area.

On the basis of topographic features, the valley is divided into four physiographic zones that is valley floor, karewas, foothill and Mountains. The valley floor ranges from 902-1600 meters above the sea level, Karewas from 1601-1800 meters, foothill ranges from 1801-2500 meters and mountains from 2501-5200 meters above sea level. The Valley is bordered on the east, south, and southwest by the Jammu province's Doda, Udhampur, Rajouri, and Poonch districts, on the northwest by Pakistan-occupied Kashmir, and on the north-east by the Ladakh province's Kargil district. According to the 2011 census, the area has a population of 7907823 people, accounting for almost 56 percent of the entire population of Jammu and Kashmir. Rural areas account for 74.36 percent of the population.

The current research is grounded on a secondary data source which include secondary data from the Economic Survey of Kashmir (2018-19) and the Census CD's 2011, The District was selected as a unit for the analysis of the cultivation intensity in the study region. In patterns of agricultural land use over a period of time and in various decades, the area share below dissimilar land-use groups was calculated in relation to the total reported area of the

Kashmir Valley and the results were interpreted. As a percentage, average, etc. were used in the study. The data is processed and displayed with the line diagram, the choropleth map and the bar diagram using GIS software.

Cropping Intensity depicts the feasibility of land for cultivation more than once in a year. Cropping Intensity is the indicator of agricultural development (Ganie et al. 2017). The high cropping intensity reveals that all the factors affecting crop cultivation are favorable for double or triple cropping pattern, while as low cropping intensity reflects the same in the opposite direction. The following formula Ganie et al. 2017, Geeta and Maniyosai 2020, Bhat 2013) was used to calculate the cropping intensity in the region.

$$Cropping\ intensity = \frac{Total\ Cropped\ Area}{Net\ Sown\ Area} \times 100 \qquad (1$$

RESULT AND DISCUSSIONS

Change in cropping pattern: Crop patterns are an important part of agro-spatial geography's characteristics because they provide a suitable foundation for regional planning. The subject has drawn the attention of geographers and agricultural land usage planners due to its significance. Cropping patterns can refer to a larger area, such as a country, or smaller divisions, such as a Union Territory, district, village, or even a farm. It might also be linked to a certain period of time. A change in farming pattern entails a change in the area concentration of various crops, which is highly reliant on the area's geographical factors. Cropping patterns are also influenced by the development of sales and marketing departments as well as population demand patterns (Shafi 2000).

Table 1 reveals the agricultural land use pattern in the Kashmir region of the erstwhile Union Territory of Jammu and Kashmir covering the period of 2013-14 and 2018-19. Total food crops and non-food crops in the valley show a slight increase in the given reference period. Food crops increase in the area is about (1.49%) while in absolute figures area increased from 318321 hectares to 323064 hectares while as non-food crops shows and increase of 0.001 percent. Among the food and non-food crops, wheat has shown a phenomenal increase of 156.2% in terms of change in the area followed by fodder 20.06% and fruits and vegetables at 11.50%. Rice shows an increase of 5.53% which in terms of change is very less with respect to other crops and therefore is a major concern in contemporary times as rice is the staple crop in the valley and is consumed at large. With the rise in population, demand for rice increases leading to food insecurity. Millets shows a remarkable decrease of (-87.22%) followed by Condiment & spices (-41.03%), Pulses (-37.84), maize (-11.44), and oilseeds (-6.69). The decrease in the area among the mentioned crops can be attributed to a variety of determinants i.e. climatic changes, irrigation patterns, construction and shifting towards horticulture for net income gains.

Table 1. Agricultural land-use Pattern of Kashmir Region (2013-14 to 2018-19)

Sr. No.	Crop	Area (in hectares)		Change in Area (2013-14 to 2018-19)
		2013-14	2018-19	
1.	Rice	123636 (30.87)	130484 (32.07)	5.53
2.	wheat	494 (0.12)	1266 (0.31)	156.2
3.	Miilets	2388 (0.59)	305 (0.07)	-87.22
4.	Maize	81531 (20.35)	72192 (17.74)	-11.45
5.	Pulses	7272 (1.81)	4520 (1.11)	-37.84
6.	Condiment & spices	1048 (0.26)	618 (0.15)	-41.03
7.	Fruits & Vegetables	101952 (25.35)	113679 (27.94)	11.50
	Total Food Crop	318321 (79.49)	323064 (79.40)	1.49
8.	Oil seeds	45976 (11.48)	42853 (10.53)	-6.79
9.	Dyes & Tanning	3441 (0.85)	3537 (0.86)	2.78
10.	Fodder	8973 (2.24)	10773 (2.64)	20.06
11.	Other Non- Food Crops	23738 (5.92)	26625 (6.54)	12.16
	Total Non-Food Crop	82128 (20.51)	83788 (20.60)	0.001

Note: Figures in parentheses represents percentage

Source: Directorate of Economics and Statistics, Jammu & Kashmir (2013-14 & 2018-19); Financial commissioner and Revenue, Jammu & Kashmir (2013-14 & 2018-19) Economic Survey Report-2017 (J&K)

Irrigation Development: The distribution of water to crops, and arable land by artificial means in order to boost the growth of crops is termed as irrigation. The water can be supplied by canals, tube wells, wells, tanks, and other sources. The union territory of Jammu and Kashmir located in subtropical and temperate latitudes is marked by great variations in terrain and altitudes which results in dissipations in temperatures and precipitation patterns. Artificial irrigation via canals, tanks, tube wells, etc. assumes importance in the valley owing to erratic precipitation and varied topography. Canal irrigation is the chief source of irrigation operating in the region. Zamindari canals popularly known as Khuls and Government constructed canals like Martand Canals are the two types of canals that supply the water to the agricultural fields in the valley.

Table 2. Jammu and Kashmir (UT) net area irrigated from different sources (2013-14 to 2018-19)

S. No	Year	Net Area Irrigated from different sources (in %)							
		Canals		Tanks		Wells		Other Sources	
		Area (ha)	Area (%)	Area(ha)	Area (%)	Area(ha)	Area (%)	Area(ha)	Area (%)
1.	2013-14	288590	89.27	7710	2.38	8950	2.76	18020	5.57
2.	2014-15	289960	89.35	7530	2.32	8610	2.75	18400	5.67
3.	2015-16	320410	90.00	7260	2.03	8840	2.48	18480	5.47
4.	2016-17	303810	90.39	6760	2.01	8010	2.38	17500	5.20
5.	2017-18	299180	90.02	6520	1.96	8260	2.48	18390	5.53
6.	2018-19	297140	90.26	6560	1.99	8160	2.47	17330	5.26

Source: Directorate of Economics and Statistics, Jammu & Kashmir (2018-19) Financial commissioner and Revenue, Jammu & Kashmir (2018-19)

Table 2 depicts the net area irrigated from different sources of irrigation in the union territory of Jammu and Kashmir. It indicates that area under irrigation has increased by 0.99% through canals, decreased by 0.39% through tanks, decreased by 0.29 through wells and through other sources there is a decrease of 0.31% during the seven years (2013-14 to 2018-19) in Jammu and Kashmir (UT). On average, canals support about 90% water supply to the arable land in the valley while other sources contribute around 10% of the total area of cropped land. As per the present estimates of a net irrigated area of 329180 hectares, 297140 is irrigated by canals alone. The area under canal irrigation does not predict any major fluctuations in the chosen reference period. Rice, wheat and maize are the chief cereal crops irrigated by canals and tube wells in the Kashmir valley. The analysis of the data reveals only 6280 hectares have been added from 2014 to 2019 under the total net sown irrigated area. The locals and government should make efforts to outspread the canal system in the dry farming areas particularly to Karewas lands (Wudras) so that additional land can be brought under the cultivation of paddy, maize, horticulture etc. which would generate more income in the hands of people effective for the growth of GDP in the country.

Table 3 shows the district-wise net area irrigated from different sources (2013-14 to 2018-19). In the Kashmir region; the total area under canals and other sources indicates a slight decrease from 92.05% to 91.05% in case of canal irrigation and 4.65 to 4.24 in case of other sources of irrigation from 2014-15 to 2018-19. On the other hand, well and tank irrigation depicts a slight increase in the given reference period. The regional analysis indicates that canal irrigation is the predominant source of irrigation in all the districts of the Kashmir valley. In district Shopian; 100% of the area is irrigated by canals followed by Pulwama (98.98%), and Ganderbal (94. 62%) in the year 2018-19. On the other side, Srinagar (60.55%) followed by Kulgam (69.20%) has the distinction of the lowest area under canal irrigation. Net sown area irrigated by tanks displays an increase in the six districts of the valley barring Anantnag, Pulwama and Bandipora. The district has the maximum net sown irrigated area (22.71%) under tank irrigation is Srinagar followed by Kulgam (4.4%). The area under well irrigation also shows an increase in all the regional units of

the valley. The Kulgam district leads in terms net sown area (11.11%) irrigated through Wells followed by Budgam (4.08%). The irrigation from other sources other than canals, wells and Tanks in the valley decreased from 4.65% in 2014-15 to 4.24 in 2018.19.

Table 3. District wise net area irrigated from different sources (2013-14 to 2018-19)

S. No	District	Net Area Irrigated from different sources (in %)							
		Canals		Tanks		Wells		Other Sources	
		2013-14	2018-19	2013-14	2018-19	2013-14	2018-19	2013-14	2018-19
1.	Anantnag	92.06	96.15	3.21	0.81	N.A	N.A	4.73	3.03
2.	Kulgam	78.21	69.20	3.43	4.24	8.01	11.11	10.35	15.43
3.	Pulwama	98.69	98.98	1.08	0.76	0.24	0.25	N.A	N.A
4.	Shopian	100	100	N.A	N.A	N.A	N.A	N.A	N.A
5.	Srinagar	65.93	60.55	20.72	22.71	1.85	2.20	11.50	14.52
6.	Ganderbal	95.94	94.62	0.79	1.39	2.02	1.66	1.25	2.30
7.	Budgam	90.35	86.25	0.93	3.54	N.A	4.08	8.78	6.10
8.	Baramulla	100	100	N.A	N.A	N.A	N.A	N.A	N.A
9.	Bandipora	89.96	91.05	0.54	0.47	0.64	1.42	8.86	7.03
10.	Kupwara	91.42	93.07	3.54	3.81	N.A	N.A	4.93	3.11
11.	Kashmir Region	92.05	91.41	2.23	2.28	1.05	2.05	4.65	4.24

Source: Directorate of Economics and Statistics, Jammu & Kashmir (2013-14 & 2018-19) Financial commissioner and Revenue, Jammu & Kashmir (2013-14& 2018-19).

Spatial Pattern of Cropping Intensity: Cropping intensity mentions to the production of multiple crops in the same field over the course of an agricultural year. Cropping intensity is increased when a greater proportion of the net sown area is cropped many times during an agricultural year. This also translates into increased productivity per unit of arable land over the course of an agricultural year. Irrigation has been critical in increasing cropping intensity. The districts of the study area are classified into three categories based on cropping intensity, as indicated in Table 4. The cropping intensity of the Kashmir division is depicted in Figure 5.

Table 4. District wise cropping intensity of Kashmir region (2018-19)

Sr. No.	District	Net Sown Area*	Double Crop Area*	Gross Crop Area*	Cropping Intensity
1.	Anantnag	44769	23243	68012	152

2.	Kulgam	29263	11297	40560	139
3.	Pulwama	33669	22342	56011	166
4.	Shopian	18567	1562	20129	108
5.	Srinagar	5944	2289	8233	139
6.	Ganderbal	13595	7517	21112	155
7.	Budgam	45024	14362	59386	132
8.	Baramulla	64817	981	65798	102
9.	Bandipora	20799	3545	24344	117
10.	Kupwara	44107	0	44107	100

Source: Financial commissioner and Revenue (2018-19) *Area in Hectares

Low Cropping Intensity: This group includes areas with cultivation intensities ranging from 100 to 120 percent (Table 5). The districts of Baramulla, Shopian, Kupwara and Bandipora fall under this category of cropping intensity. The least cropping intensity among this category was recorded in Kupwara (100) followed by Baramulla (102), Shopian (108) and Bandipora (117). These districts are not placed in close proximity to one another. One significant cause for low cropping intensity is that the majority of these districts are drought-prone, mainly Baramulla, Kupwara and Bandipora and irrigation infrastructures are still sparsely distributed throughout these districts. The majority of land irrigation is supplemented by canals which is confined to a certain area; mostly in plain areas. As a result, the upper regions have sparse irrigation facilities which results in low cropping intensity.

Table 5. Kashmir Region: Cropping Intensity-2018-19

Sr.	Irrigation Intensity	Name of District
1	High (140 and above)	Anantnag, Pulwama, Ganderbal
2	Moderate (120-140)	Budgam, Srinagar, Kulgam
3	Low (100-120)	Kupwara, Baramulla, Shopian, Bandipora

Area of Moderate Cropping Intensity: This group includes areas with a cropping intensity of between 120 - 140 percent (Table 5). This category includes Budgam, Srinagar and Kulgam. Among this category, Budgam recorded the cropping intensity value of 132 followed by Srinagar (139) and Kulgam (139). In Budgam & Srinagar, the canal irrigation decreased from 90.35 (2013-14) to 86.35 in (2018-19) while the other sources of irrigation recorded increase (Table 3) in the given period. As a result of this, the irrigation which was initially confined to lower areas also developed in upper areas through the development of wells, tube wells and springs. It is because of this, the farmers in the upper reaches started cultivation on an intensive scale and impacted cropping intensity. Srinagar

district is also a commercial hub supplemented by well-developed irrigation facilities and most of the land is fed by Jhelum River and also by tanks, wells and other sources of irrigation which facilitates different cropping combinations. On the other hand, Kulgam district has also resulted in shift in cropping pattern as most of the farmers are converting their land from paddy field to other commercial crops (Shah and Anbuvul 2016) which leads to increase in area of commercial crops results in medium cropping intensity.

Area of High Cropping Intensity: This group includes areas with cultivation intensities ranging from 140 and above percentage (Table 5). The research region's Anantnag, Pulwama and Ganderbal districts have a high cropping intensity. Among this category, Anantnag recorded the cropping intensity value of (152) followed by Ganderbal (155) and Pulwama (166). Irrigation is extensively developed in each of these districts. Majority of the agricultural land occupies the plain areas which is mostly irrigated by major tributaries of Jhelum and Sind. The upper parts of these districts are fed by springs and wells. To sum up, extensive irrigation facilities, commercialization of crops, favorable climatic conditions and topography are the major determinants which facilitates high cropping intensity in these regions.

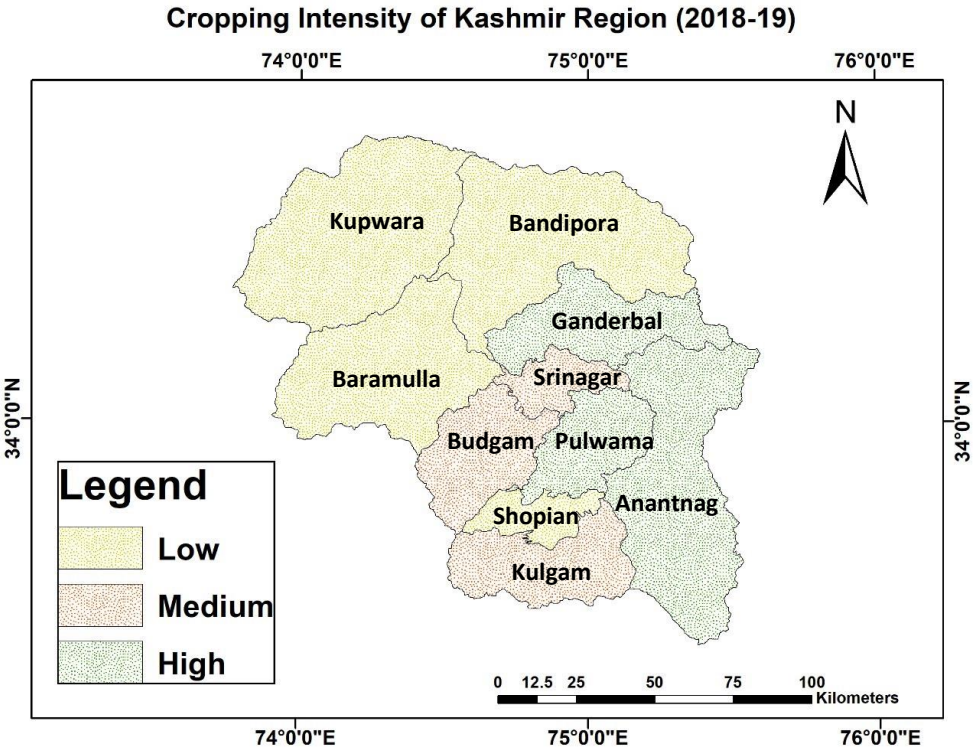

Figure 2. Map of cropping intensity of Kashmir region (2018-19)

As conclusion, agriculture is the primary economic activity of Jammu and Kashmir. Around 70% of the inhabitants in the Union Territory derive their livelihood from agriculture and allied activities. Cropping patterns in a region are strongly influenced by geography, socioeconomics and history. The physiography, climate, soil, and

water are the key factors that places restrictions on plant and animal growth and dispersal. Farmers' involvement in the cultivation of specific crops in an area is also critical. The physical atmosphere constrains the crop selection, either by restricting some plants from growing or by limiting their harvest per unit area. Crop combinations in the different parts of the valley are heavily influenced by geography, soil, and extreme weather conditions. Rice and maize account for around 96 percent of total cultivated land under food grain crops, according to Weaver's technique. As a result, it might be simply referred to as a two-crop combination region. The findings of the study reveals that total food crops and non-food crops recorded a slight increase from 2013-14 to 2018-19. Among food crops, wheat recorded a remarkable increase of 156.2% in terms of change in area followed by fodder (20.06%) and fruits & vegetables (11.50%). The inter district analysis reveals that Kupwara followed by Baramulla, Shopian and Bandipora has recorded least cropping intensity, while as the districts of Anantnag, Pulwama, and Ganderbal have a high level of crop intensity. Budgam, Srinagar and Kulgam districts are moderately diverse.

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DECLARATION OF COMPETING INTEREST

The authors have no conflicts of interest to declare that are relevant to the content of this article.

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