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EMERGING TRENDS IN AREA AND PRODUCTION OF PULSES IN UTTAR PRADESH

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Abstract: *Because of their affordability and accessibility, pulses have long been an important part of India's food supply, helping to ensure that its people ate nutritiously balanced meals. Pulses are consumed by people from all walks of life, regardless of their socioeconomic status, class, or rural-urban location. It has long been a staple of Indian cuisine. Food security is dependent on the availability and use of pulses. Despite the fact that pulses are an essential part of our country's agricultural system, the production of pulses is far behind the growing demand from consumers. Pulses have long been a key export from India. As pulse crops are now cultivated on irrigated land and the government has changed its emphasis to enhancing pulse crop yield, Uttar Pradesh offers enormous potential for pulses production. Present paper attempts to review the trends in growth in area and production of pulse crops in Utter Pradesh.*

INTRODUCTION

Farmers in Uttar Pradesh, a state recognized for its agricultural prowess, rely on crops for their living. High-value crops and infrastructure development are essential in the state of state's agricultural policy, which stresses regional specialisation in the production of commodities that best fit their particular bio-physical endowment and enhancing soil and water sustainability (Fahimuddin, 2013). A significant phenomenon in Uttar Pradesh is crop diversification. It was customary to cultivate urd and moong in the kharif season. As a result, farmers have begun cultivating urad and moong throughout the summer months, which has resulted in an increase in the area under these crops since the late 1970s and early 1980s (Sharma and Sisodia, 2018). The yield differential is the difference between the greatest yield that can be achieved and the yield at the farm level at which it is measured. Various food crops, such as rice, wheat, and maize, have yield gaps that may be seen empirically (Jha, et al., 2011; Hall, et al., 2013 and Bhatia, et al., 2006). The literature on yield gap analysis is thin on the ground when it comes to key pulse crops like chickpea, pigeon, lentil, and so on. There have been various research (Dwivedi, et al., 2013; Bhatia, et al., 2006; & Singh, et al., 2001) that have attempted to quantify the yield differences between chickpeas and pigeons in India, mostly in aggregate levels. Research stations and farmers' areas have varying yields because of fast technological development, which is important for policymakers to consider when developing and implementing regulations. There was a discrepancy between the actual average output of farmers' farms and the prospective production of crops derived from yearly reports of the Indian Institute of Pulses Research, Kanpur, India.

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There were eleven significant pulses (yield / kg) that were categorized into two categories based on the average yield of total pulses from 2007–2012: those that were above and those that were below the national average. While most states had an increase in the average yield of total pulses from 2007 to 2012, Rajasthan and Karnataka saw a decrease in the national average of 786 kg / ha. Smaller states like Jharkhand, West Bengal, Bihar, and Haryana had a far lower average output than Rajasthan and Karnataka despite their larger territory. The yield of pulses crops in their tiny producing states was greater than the national average, indicating a stable state of pulses crops in their main producing states and the ability of small pulses growing states to develop pulses. To ensure long-term growth and production stability, strategies tailored to minor pulses producing nations should be implemented. In India, states like Rajasthan and Karnataka, which produce the majority of India's pulses, had lower yields than the national average, while smaller states like Orissa and Tamil Nadu had greater yields.

That means that the nation's pulses output has to be improved immediately by focusing on the smaller states of the country. Compared to the national average, Madhya Pradesh, the largest pulses-producing state, had lower yields in chick peas. The yield of individual pulses is increasing and has the capacity to rise, and such a condition should be maintained with the proper governmental action in the minor states. An important part of the National Food Security Mission-Pulses (NFSM-Pulses) has been to encourage farmers to share the word about integrated nutrient management and plant protection, and this has been bolstered. Expansion and institutional support are required to keep the production schedule on track (Rimal and Kumar, 2015)

AREA AND PRODUCTION OF PULSES CROPS:

Pulses are the edible dried seeds of plants that can be digested. Due to their role in the diets of millions of people throughout the globe, they are of particular nutritional and economic significance. Because of their high protein content (two to three times more than most cereals), pulses are an important source of both protein and energy for humans. Approximately 90% of the world's human pulses intake is consumed in underdeveloped nations. Pulses supply roughly 10% of daily protein and 5% of daily calories in the diets of people in most low-income nations. Because of its high protein content, pulses are essential in a nation like India for individuals of all socioeconomic classes. It is because pulses may be produced in rainfed environments without the need for extensive irrigation that they are planted in the post-grain / cash crop zones. In terms of both production and consumption, India is the world's biggest pulses producer and consumer, accounting for 25 percent of the global total (Srivastava et.al., 2010). For the last 40 years, pulse production has stayed essentially unchanged (Sekhar and Bhatt, 2012). In 2016, India accounted for 38 percent of the world's pulses area. Almost a quarter of the world's GDP came from India in 2016. Only 23 percent of the world's output came from India in 2016, down from 45 percent in 1961. However, India's pulses yield was comparable to the world's (Verma, 2019). All three seasons are suitable for the cultivation of pulses. Rabi, Kharif, and Zaid in India are examples of this.

The commodity has three distinct growing seasons: (I). Foods that may be grown in the Kharif and Rabi seasons include Arhar (Urad), Moong (Lobia), Kulthi (Kulthi), and Moth. Pigeon peas and peas are the two most commonly grown pulses in India. Madhya Pradesh has the largest area of pulse production, followed by Rajasthan, Maharashtra, Karnataka, Uttar Pradesh, and Andhra Pradesh. In addition to Madhya Pradesh, Rajasthan, Maharashtra, and Karnataka, the area under Chickpea was also the highest. Pigeon pea was most prevalent in Maharashtra, followed by Karnataka, Madhya Pradesh, and Uttar Pradesh in terms of land area. Other notable producers were Telangana, Gujarat, and Andhra Pradesh. In Uttar Pradesh and Madhya Pradesh, peas occupied the largest amount of land in the region. Odisha and Jharkhand were the other two producers. Madhya Pradesh was the leading producer of chickpeas. Maharashtra and Rajasthan followed. Madhya Pradesh and Uttar Pradesh are the primary producers of peas in the country. Orissa ranked third in terms of total area under cultivation for peas, but the state's pea yields were dismally low. Urdabeen and mungbean were largely produced in the states of Tamil Nadu, Uttar Pradesh, Andhra Pradesh, Madhya Pradesh, and Maharashtra. Liquid lentils are mostly produced in Uttar Pradesh, Madhya Pradesh, Bihar, and West Bengal (Table 1).

Table 1 : Major Pulses Producing States in India

Crops	Reference Year	States
Chickpea	2013-14	Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, , Karnataka , Andhra Pradesh, Gujarat, Tamil Nadu, Jharkhand , Bihar
Pigeon pea	2013-14	Maharashtra, Karnataka, Madhya Pradesh, Uttar Pradesh, Andhra Pradesh, Gujarat, Jharkhand, Odisha, Tamil Nadu
Urdbean	2013-14	Tamil Nadu, Uttar Pradesh, Andhra Pradesh, Madhya Pradesh, Maharashtra, Jharkhand , Rajasthan, West Bengal Gujarat
Mungbean	2013-14	Rajasthan, Maharashtra, Andhra Pradesh, Tamil Nadu , Madhya Pradesh, Gujarat, Bihar, Odisha , Karnataka
Lentil	2012-13	Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Jharkhand, Rajasthan, Assam
Pea	2012-13	Uttar Pradesh, Madhya Pradesh, Jharkhand , Assam, Bihar, Maharashtra
Mothbean	2011-12	Rajasthan, Gujarat, Maharashtra, Jammu and Kashmir
Lathyrus	2011-12	Chhattisgarh, Bihar, West Bengal, Madhya Pradesh, Maharashtra
Kulthi	2011-12	Karnataka, Tamil Nadu, Odisha, Chhattisgarh, Maharashtra, Andhra Pradesh, Jharkhand , Bihar

Source: Indian Institute of Pulses Research, Kanpur

Madhya Pradesh also has the greatest pulse output in the country. Maharashtra, Rajasthan, Uttar Pradesh, Karnataka, and Andhra Pradesh were the next states to join. Despite the fact that Karnataka had a larger area under production, Uttar Pradesh had a higher production rate than Karnataka. These points show the disparities in production productivity. Although Madhya Pradesh's output has grown, the state's proportion of overall production in the nation has decreased from 32.43 percent in 2015-16 to 27.20 percent in the current fiscal

year. Compared to 2015-16, Maharashtra's production and proportion of the state's total output grew significantly in 2016-17. It rose from 9.45 percent to 16.29 percent of the total (Table 2).

Table 2: Share by Major Pulses Producing States

State/Year	2014-15	2015-16	2016-17
Madhya Pradesh	28.15	32.43	27.20
Maharashtra	11.97	9.45	16.29
Rajasthan	11.38	12.17	13.75
Uttar Pradesh	8.39	7.12	9.44
Karnataka	8.10	6.97	7.51
Andhra Pradesh	5.54	7.52	4.02

Source: CMIE States of India

India produces a wide variety of pulses, including chickpea, pigeon pea, urdbean, mungbean, and lentil. More than half of India's pulse consumption is made up of chickpeas and pigeon peas. Chickpea production's share climbed from 35% to 45% over this time period, whereas mungbean production's share increased slightly (Table 3).

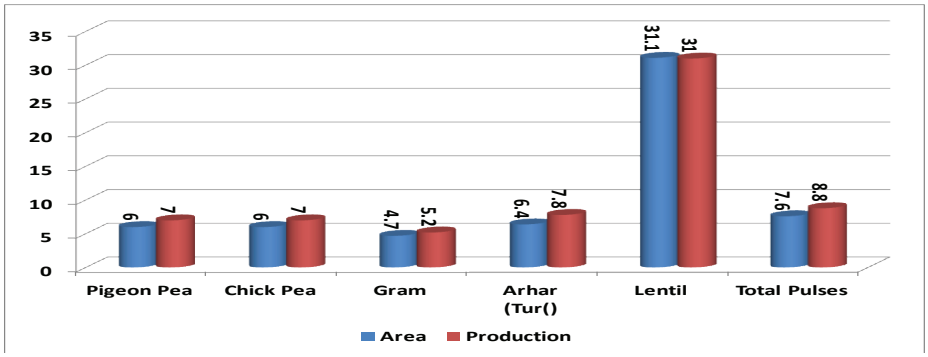
Table 3: Composition of Pulses in Production of Pulses in India

Crop	2001	2011
Chickpea	34.84	45.07
Pigeonpea	20.31	15.68
Urdbean	11.64	9.65
Mungbean	9.3	9.87
Lentil	8.3	5.15
Other Pulses	15.61	14.18
Total	**100.00**	**100.00**

Source:-Sen, Jayanta et al. (2018)

The share of Uttar Pradesh in area and production under various pulses crops is shown in chart 1. During 2017-18 the share of state in area and production of lentil was reported 31.14 and 31.02 percent, respectively. However share of area and production of Arhar, Pigeon Pea, Chick Pea and Gram was recorded as low as about 6 percent.

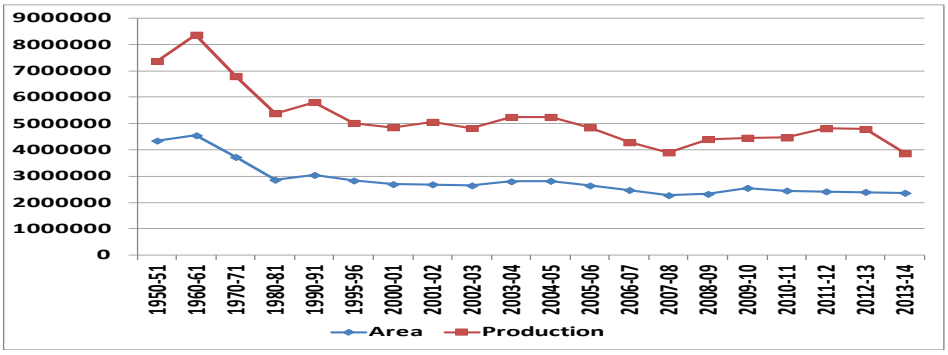
Chart 1: Share of Uttar Pradesh in Area and Production of Pulses



Source: Agricultural Statistics at A Glance, 2018, Ministry of Agriculture & Farmers Welfare, Government of India

Chart 2 depicts the state of Uttar Pradesh's land area, output, and total pulses. Pulses have decreased in area, output, and productivity from 1950-51 to 2013-14 in the state. Pulses accounted for 21.76 percent of the total planted area in 1950-51, a figure that dropped to 9.11 percent in 2013. As a result, the total pulse area in the state has decreased mostly in the post-reform era. In 2013-14, the average yield of all pulses was 6.36 MT/hectare, down from a 1950-51 high of 27.68 MT/hectare.

Chart 2: Area and Production of Pulses in Uttar Pradesh Area in Hectare Production in MT



Source, Directorate of Agriculture, Government of Uttar Pradesh

There are state-by-state maps of pulse production and yield in India in Table 4. Pulses were grown mostly in the states of Madhya Pradesh, Rajasthan, Maharashtra, Uttar Pradesh, and Karnataka in 2016-17. Uttar Pradesh produced 8.5% of the state's total pulses, but only 9.44% of the state's total output. Jharkhand, West Bengal, Madhya Pradesh, Uttar Pradesh, Gujarat, and Maharashtra had the highest overall pulse production in 2016-17.

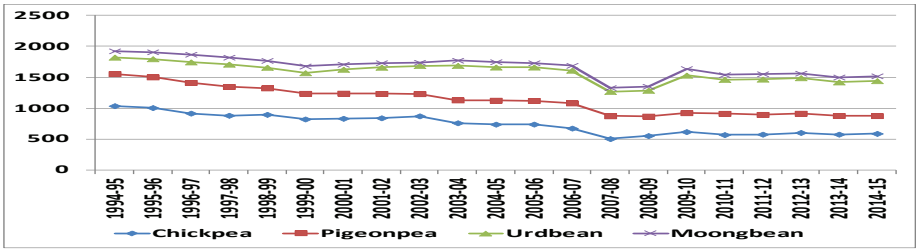
Table 4: State-wise Area, Production and Yield of Pulses in India (Area - Million Hectares Production - Million Tonnes Yield –K.g./ Hectare)

State	Area	% to All India	Production	**% to All-India**	**Yield**
Madhya Pradesh	6.66	22.63	6.29	27.20	944
Rajasthan	5.27	17.90	3.18	13.75	604
Maharashtra	4.36	14.80	3.77	16.29	865
Uttar Pradesh	2.51	8.52	2.18	9.44	871
Karnataka	2.97	10.08	1.74	7.51	586
Andhra Pradesh	1.41	4.80	0.93	4.03	659
Gujarat	0.94	3.20	0.82	3.54	868
Jharkhand	0.80	2.73	0.81	3.49	1002
Tamil Nadu	0.79	2.67	0.43	1.85	544
Chhattisgarh	0.88	3.00	0.76	3.28	858
Telangana	0.70	2.38	0.54	2.32	771
West Bengal	0.27	0.91	0.26	1.12	968
Others	1.88	6.38	1.43	6.19	
All India	29.45	100.00	23.13	100.00	786

Source: Agricultural Statistics, India 2018

Chart 3 depicts the expansion of pulses-producing land in Uttar Pradesh during the last several decades. During the years 1994-1995 to 1999-2000, 2005-2006 to 2009-10, and 2010-11 to 2014-15, the state's area under pulses showed negative increase. The area under chickpea and pigeonpea in the state has decreased in both the pre- and post-reform era. Urad and moong beans have shown a considerable increase in area under cultivation between 1994 and 1999, as well as from 2005 to 2009. However, from 2010-11 to 2014-15, these crops had negative growth.

Chart 3: Growth of Area under Pulses in Uttar Pradesh (Area in 000 Hectares)



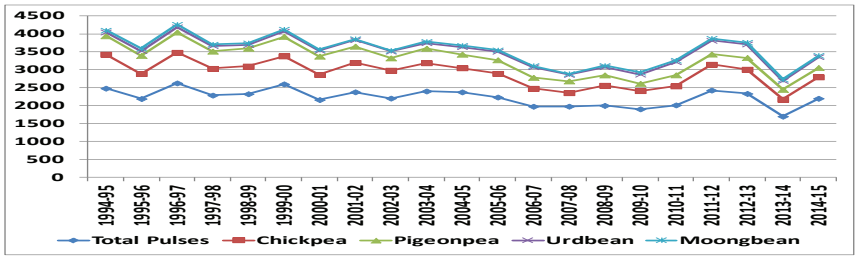
Source, Directorate of Agriculture, Government of Uttar Pradesh

More over a quarter of the state's pulse area was under urad bean in 2014-15, whereas less than a quarter of the state's pulse area was under chick pea. Pulses are more prevalent in the eastern and Bundelkhand regions of the states. Pulses crops are grown in various parts of the state in varying proportions. A majority of the eastern region was dedicated

to lentils and pigeon peas (tur), while the western region had more than two-fifths of the total area dedicated to urad beans. About 39 percent of Bundelkhand's land was devoted to urad bean and 30 percent to chick pea in the Central region. Urad bean and pea accounted for more than half of the region's total pulse area. In 2014-15, Bundelkhand accounted for more than half of the state's total acreage planted to pulses (54.32 per cent). During the year, the Eastern region had a considerable portion of the overall area under pulses (26.88 per cent). The Eastern region accounted for 57.10 percent of the total pigeon pea area, while Bundelkhand had a share of 20.35%. More than two-thirds of the state's chick pea cropland was found in Bundelkhand, according to official data (67.90 per cent). Lentils accounted for 82% of the land in Bundelkhand and the Eastern region, whereas peas accounted for 74% of the area in Bundelkhand. Urad beans are grown on a substantial amount of land in Bundelkhand, as well (57.21 per cent). However, the percentage of the Central region in the area under moong bean was large (22.06 per cent).

Chart 4 shows the increase in pulse output in Uttar Pradesh. The state's pulse production increased nominally from 1994-1995 to 1999-2000 and from 2010-11 to 2014-15. However, the output of total pulses during 2000-01 to 2004-05 and 2005-06 to 2009-10 was found to be declining. During 1994-95 to 1999-2000, 2000-01 to 2005-06 to 2009-10, there was a decrease in chickpea output. Although nominal rise was seen in the production of chickpea, pigeonpea, and urad bean from 2010-11 to 2014-15,

Chart 4: Growth of Production of Pulses in Uttar Pradesh (Production in 000 Metic Tones)



Source, Directorate of Agriculture, Government of Uttar Pradesh

In 2014-15, the state's total pulse output was 78.2 percent of the total production in Bundelkhand and the Eastern area. In terms of moong and urad bean output, the Western and Central regions accounted for more than 60% of the total. More over two-thirds of the state's pigeon pea output was recorded in the Eastern area, while the Eastern region produced around 60 percent of the state's lentils. In 2014-15, Bundelkhand accounted for 75% of the country's pea output, 55% of its urad bean production, and nearly 50% of its chickpea production. The state's urad bean and pea output combined accounted for 25.79 percent and 25.26 percent of total pulse production, respectively. The mix of pulse crops in overall pulse production has varied significantly across all geographical areas. Approximately 2/5 of the overall pea output was recorded in Bundelkhand, while about 44% of the total urad bean production was reported in the Western area. A total of 58.52 percent of the pulses produced in the Eastern area came from lentil and pigeon pea crops.

Constraints

In addition to weather and soil conditions, agro -economic constraints, better input quality, availability of pests and diseases, technical and infrastructure constraints as well as blue-bull troubles as well as credit, marketing and policy constraints are some of the major constraints in the production of pulses (Singh et al., 2015). It is vital to promote genetically modified crops in order to boost pulse yields. This crop's vulnerability to pests and diseases, as well as its restricted genetic base, make it difficult to breed. Increase the genetic diversity of pulses through improving pre-breeding and generating major germplasm sets (Subramaniam, 2016). There is a need for genetic research in order to better understand pests and disease resistance, as well as the use of genes and markers in mapping and tagging, gene pyramiding, and the creation of transgenic chickpeas. Singh et al., (2015) have outlined some strategies and procedures for increasing agricultural yields without extending crop acreage. Vertical cropping begins with pulse intercropping, which may be done in stages. Agricultural research stations have created a variety of pulse intercropping techniques. Agricultural methods in rainfed areas are well-known to farmers and have been practised for generations. This tactic is known as replacement or multiplication in the vertical approach. In order to promote high-quality seeds, we must first ensure that superior types of seeds are available in adequate numbers and at the right time. In the vertical strategy, balanced nutrition management is the third replacement seed. Research shows that sulphur and zinc sulphate may be applied at the time of planting and every two years to solve the issue of pulses depleted in these components. In addition, it has been noticed that the usage of these chemicals may increase water efficiency and agricultural output. Pulse mechanization follows a vertical orientation. To boost agricultural yields, soil mechanization is critical. There are several benefits to adopting inter-culture operations that include deep-tilling with ridge planting, line planting, automation and the use of mechanized harvesters. It has been made possible for farmers in Madhya Pradesh to get subsidies for deep ploughing their land as part of the 'Haldhar' programme of the state government. Some initiative may be present. The vertical approach is the use of resource saving technology to expand irrigation services. Pigeon peas have also shown to be a good candidate for sprinkler irrigation.

Rice fallow land should be used more efficiently and pulses should be replaced with low-productivity crops, according to Singh et al., (2015). It is possible to employ rainwater for the establishment of rabi crops (Anonymous, 2013 and Singh et. .al., 2013). Pulses, according to Jeswani and Baldev (1990), have a unique trait with Rhizobium that can thrive in soil on its own. Rhizobium fixes atmospheric nitrogen by penetrating pulp crop root hairs. An effective Rhizobium culture is used for artificial inoculation, which guarantees that the crop receives the greatest amount of symbiotic nitrogen. Growth of riseobium leads to higher yields. Multiple diseases and pests may attack pulse crops at once, requiring a wide variety of disease-resistant cultivars. Integrated pest control has been recommended by Reddy (2009). Integrated pest control of kharif pulses post-harvest includes agricultural systems that include crop rotation or intercropping of non-host and host crops, as well as other agro-economic techniques such as utilizing solar energy before summer ploughing. Storage activities are

responsible for the greatest amount of post-harvest losses, according to a new study. Pulses growing are a demanding endeavor for farmers. The primary obstacles are a shortage of HYV seeds, fertilizers, plant safety chemicals, and poor production availability, as well as a lack of input subsidies, a low seed rate, and a general lack of information about seeds, treatment, weeds, and so on at the time of sowing. Yadav et al. have also reported on the dose and manner of controlling fertiliser inputs (Kumar et al., 2009).

CONCLUSION

Indian agriculture has grown and developed as a result of the government's decision to liberalise the industry. India's most populated state is Uttar Pradesh. Agriculture has grown significantly throughout the state. Pulses may also be grown in the state, which offers room for growth. As a result of globalisation and economic liberalisation, the state government has launched a number of initiatives to help businesses adapt to the new business climate. It's not only the federal government that's putting its money where its mouth is when it comes to promoting agriculture in the state. Pulses production in India is dominated by Uttar Pradesh. Pulses crops are mostly grown in the eastern region and the Bundelkhand region of the state. Pulses growers in the state include the Pigeonpea, Chickpea, Pea, Lentil, Moongbean, and Urdbean. There are certain irrigated areas in the state where pulses are cultivated, such as the Central and Western regions, where Urdbean and Moongbean crops are farmed. Growth in the area, output, and yield of pulses crops has fluctuated throughout time.. As a result of the execution of the National Food Security Mission and its coverage of all districts under the Mission for pulses production, pulses output in the state are predicted to dramatically change.

References

Ali, M. and Gupta, S. (2012). Carrying capacity of Indian agriculture:Pulses crops. *Current Science* 102(6): 874–881.

Annoymus. (2013) Report of Expert Group on Pulses. Department of Agriculture & Cooperation Government of India, Ministry of Agriculture.139.

Bhatia, V. S., P., Singh, S. P., Wani, A. V. R. KesavaRao, and K. Srinivas. (2006)"Pea in India using Simulation Modeling".*Global Theme on Agro-ecosystems*, Report no. **31**. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Andhra Pradesh, India.

Dwivedi, S. V., R. K. Anand, and M. P. Singh, 2013 "Varietal Performance of Oilseeds and Pulses at Farmers Field in Vindhyan Zone under Rainfed Condition". *Technofame-A Journal of Multidisciplinary Advance Research*, 2(1):25-29.

Fahimuddin (2013) "Diversification of Agriculture in Uttar Pradesh: Need for Policy Reorientation", *Journal of Rural Development*. 29(2):141-156.

Hall, A. J., Feoli, C., J. Ingaramo, and M. Balzarini. (2013) "Gaps between Farmer and Attainable Yields across Rainfed Sunflower Growing Regions of Argentina", *Field Crop Research,* 143: 119-129

Hasan, Rooba and D.N. Khan (2018)"Diagnosis of Pulse Production and Consumption in Uttar Pradesh: An Inter-Regional Analysis"*International Journal of Current Microbiology and Applied Sciences, Volume 7* (7): 860-865

Jeswani, L., &Baldev, B. (1990) "Advances in pulse production technology"Jeswani, L. M. and Baldev, B.(Eds) ICAR publication, New Delhi, India, 79.

Jha, G.K., R.R., Burman, S.K.,Dubey, and G.Singh. (2011) "Yield Gap Analysis of Major Oilseeds in India", 6(2): 209–216.

Kumar, Parveen et al. (2009) "Constraints In Pulses Cultivation As Perceived By The Farmers", *Rajasthan Journal of Extension Education*17-18

Kumar, Rajesh, S.K. Singh and Uma Sah (2017)" Multidimensional study of pulse production in Bundelkhand region of India",*Legume Research*, 40(6)

Patel AK, Singh D, Baghel KS and Pandey AK. (2014) "Enhancing Water Productivity to Improve Chickpea Production in Bansagar Command Area of Madhya Pradesh",*Journal of AgriSearch* 1(1): 19-21

Reddy, A. A. (2009)"Pulses production technology: Status and way forward"*Economic and Political weekly*, 73-80.

Rimal, N. S. and S. Kumar (2015) "Yield Gap Analysis Of Major Pulses In India",*Journal of Institute of Agriculture and Animal Science*, 33-34

Sekhar, C. S. C., & Bhatt, Y. (2012). Possibilities and constraints in pulses production in India and impact of national food security mission (final report) Institute of Economic Growth. *New . Delhi*

Sharma, M.K. B.V.S. Sisodia and Vinit Kumar (2014) "Pattern Of Growth And Scenario Of Pulse Production In Uttar Pradesh: A Regional Study", *International Journal Of Innovative Social Science & Humanities Research*, Vol (2), Issue-1, December

Singh, A. K., Singh, S. S., Prakash, V., Kumar, S., &Dwivedi, S. K. (2015). "Pulses production in India: present status, bottleneck and way forward". *Journal of AgriSearch*, 2(2), 75-83.

Singh, N., Kaur, H. and Singh, R. (2001) "A Diagnosis on Area, Productivity and Production of Pulses in India".*Indian Journal of Agricultural Economics,* 57(3): 393-394.

Singh,R.P.(2013)"Status paper on pulses". Directorate of pulse development, Bhopal, 89-90.

Srivastava, S. K., Sivaramane, N., & Mathur, V. C. (2010). Diagnosis of pulses performance of India. Agricultural Economics Research Review, 23(1), 137-148.

Subramanian, A. (2016)"Incentivising Pulses Production Through Minimum Support Price and Related Policies". Ministry of Finance, Government of India.

Varma, Poornima (2019) Production, Markets and Trade: A Detailed Analysis of Factors Affecting Pulses Production in India, Centre for Management in Agriculture Indian Institute of Management, Ahmadabad

Yadav, V. P. S and Kumar R. (2007)"Boosting Pulse production through front line Demonstration: An innovative approach*". Agri Ext.* Review, 31: 31-37