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RESEARCH ARTICLE

STUDY OF CHANGES IN THE CULTIVATION AREA, IRRIGATED AREA, PRODUCTION & PRODUCTIVITY OF DIFFERENT CROPS IN THE STATE OF UTTAR PRADESH

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Abstract

India is one of the largest producers of food grains in the world. One of the major contributors to this achievement is the state of Uttar Pradesh. The state has seen significant contributions coming in due to focus of governments and farmers on it.Other factor is the huge demand for cereals in the global market that is creating an excellent environment for the export of Indian cereal & food grains. All food grain types have seen significant changes in their area of cultivation to coverage under irrigated area. Increase in sown area also has led to increase in production. Additionally, good farming practices, availability of irrigation water have contributed largely to increase in average yield of most of the food grains in the state for the period under study. Increase in sown area, it seems has also been driven by opportunity to increase earnings of farmers. This study has covered primarily, area of production, irrigated area, absolute production, and average yield of various crops which are cultivated in the state of Uttar Pradesh for the period from 2006-07 to 2012-13.

Introduction:-

Constantly agriculture and agricultural practices are changing across the globe due to many factors, like climate change, availability of water, government policies and more so due to inclination of people involved, accepting agriculture as an occupation. On one hand, size of holdings is decreasing in densely populated countries like India and on the other hand, mechanization of farming has put pressure to have bigger holdings for reaping benefits from modernfarming practices.

Simultaneously, constant change in availability of water is also changing the pattern of cultivation of different crops in different regions. Farmers who are involved in farming are trying to fulfil their expectationsof earning more by growing all those crops which are high in demand in the market.

Looking at the current water availability in the state, irrigation uses around 90% of available freshwater, as against 70% globally. This has put an unrequired pressure on water availability as freshwater demand is also increasing from different other sectors. Growing population along with heightened commercial activities has added to woes. However, constant govt interventions, area under net irrigation has increased from 18 to 48%. Primarily, it has happened due to people resorting to owning up their own tube wells and decreasing their dependency on canal system of the country. Water from rivers, lakes, reservoirs, and wells are the main sources of fresh water in the state.

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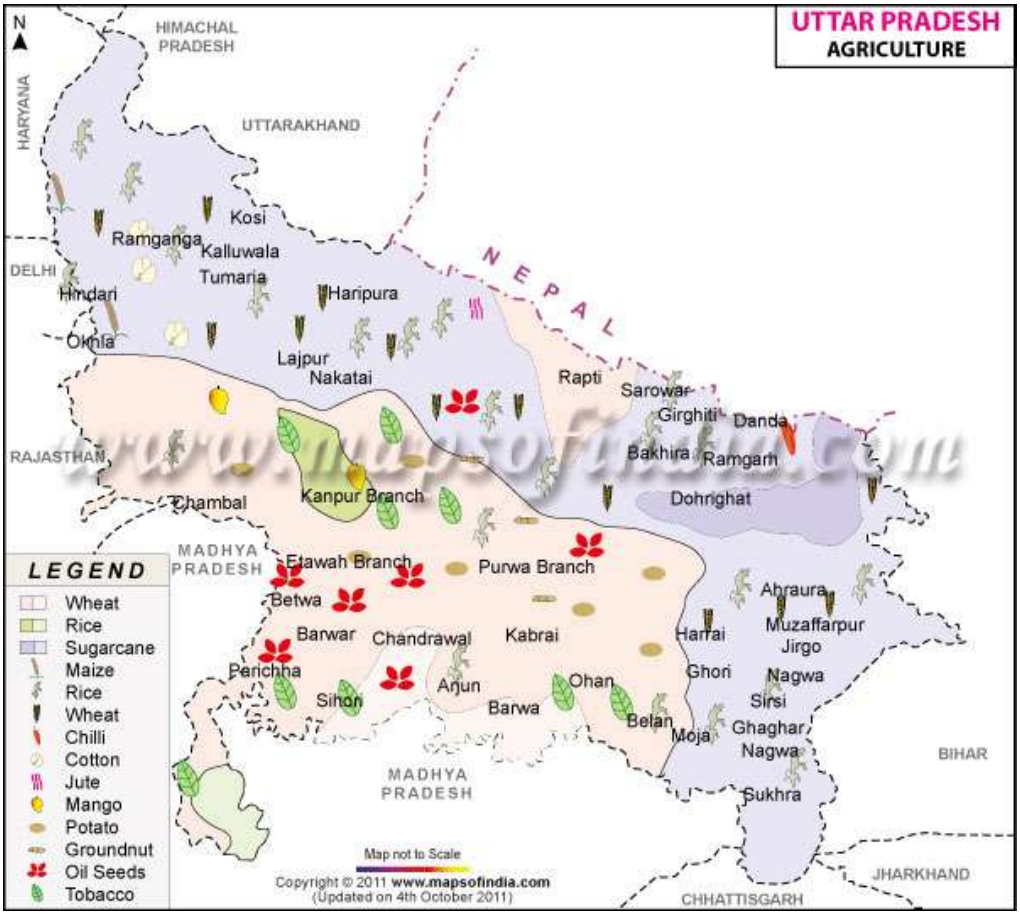
Owing to above mentioned factors area under cultivation, production and productivity of various crops in the state is witnessing constant fluctuation.

Objectives:-

In this paper, primary focus is to study various agriculture related factors along with to know how different crops and their share in overall food grain production has changed in the state. The major objectives for this paper to mentionare:

1. To study change pattern in net irrigated area in the state and variations in cultivation of various crops.
2. To study production and productivity of various crops.



Materials & Methods:-

In this paper, relevant data on different relevant factors have been collected from different sources. The study is done on secondary data and the data is collected for two periods, that are 2006-07 and 2012-13, giving a time frame of six years for this study. The calculation is done based on percentage change in different variables for the study period.

Results & Discussion:-

Discussion is contained around following factors and changes during the given timeframe from 2006-07 to 2012-13.

1. Area under principal crops in UP
2. Irrigated Area under principal crops in UP
3. Production of principal crops in UP
4. Average yield of different crops
5. Overall change in production of food grains
6. Overall change in irrigated area of food grains
7. Overall change in production of food grains
8. Overall change in average yield of food grains

Area under principal crops in UP

Uttar Pradesh is one of the states in the country which is well bestowed upon by the nature for agriculture and cultivation for various food grains.

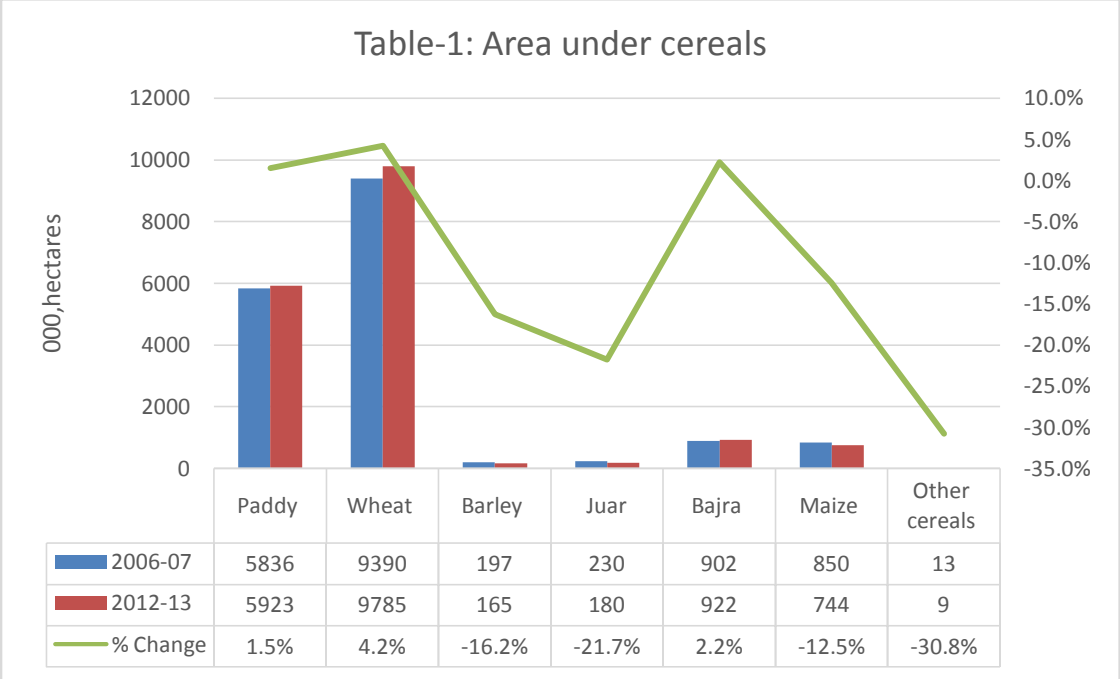
Contribution of UP to overall food grains production in the country is significant as naturally, land availability for agriculture is very high in the state. For the reason of study, area is divided under:

1. Area under cereals
2. Area under pulses
3. Area under oilseeds
4. Area under other major crops

Cereals

Paddy, wheat, barley, juar, bajra, maize are the main cereals grown in the state. Given table below signifies the ever-increasing demand for paddy & wheat. Paddy and wheat cover area of 5836 thousand and 9390 thousand hectares in the year 2006-07; together wheat & paddy having majority share in overall area under cereal production in the state.

Furthermore, area has increased to 5923 thousand hectares for paddy and 9785 thousand hectares under wheat in the year 2012-13. The percentage increase for these two cereals from the year 2006-07 to 2012-13 is 1.5% and 4.2% respectively as shown in Table-1.



	Paddy	Wheat	Barley	Juar	Bajra	Maize	Other cereals
2006-07	5836	9390	197	230	902	850	13
2012-13	5923	9785	165	180	922	744	9
% Change	1.5%	4.2%	-16.2%	-21.7%	2.2%	-12.5%	-30.8%

Pulses

Urd, moong, arhar, gram are the pulses which are grown primarily in the state.From the demand point of view, gram, arhar and urd are the pulses which are high in demand and therefore, are sources of higher income for farmers.

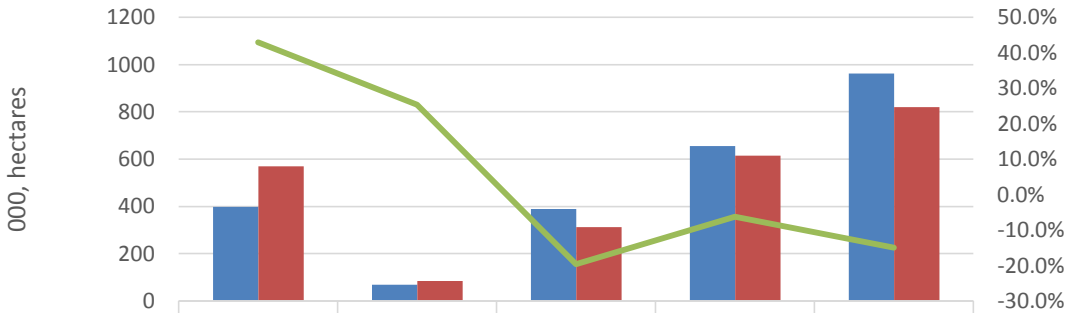
Considerable amount of fluctuation is evident from the data provided in the table below in terms of area under cultivation, seemingly due to higher income opportunities for farmers.

The area under urd has seen significant increase to 569 thousand hectares in the year 2012-13 from 398 thousand hectares in 2006-07, which is 43% in six years.

Moong is another pulses, for which area has increased by 25.4% during the study period. Surprising observation is reduction in area under arhar and gram. For arhar, area has decreased by 19.6% and for gram, decrease is 6.3%.

Cumulatively, area has further decreased by 15%, except for four major pulses from the year 2006-07 to 2012-13 as shown in Table-2.

Table-2: Area under Pulses in UP

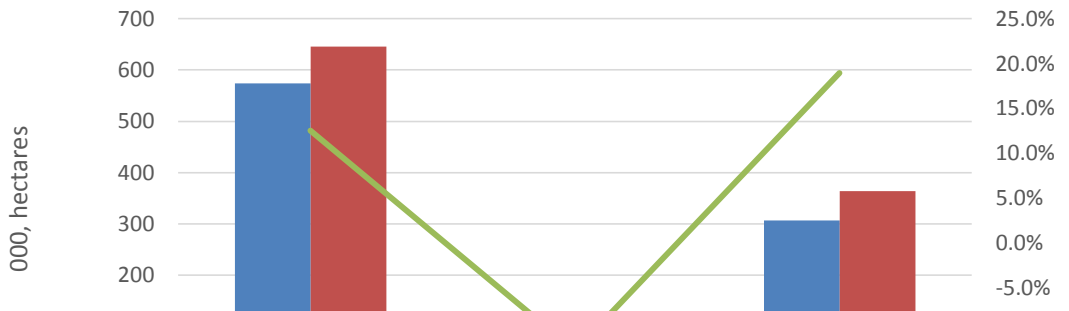


	Urd	Moong	Arhar	Gram	Other Pulses
2006-07	398	67	387	655	962
2012-13	569	84	311	614	818
% Change	43.0%	25.4%	-19.6%	-6.3%	-15.0%

Oilseeds

Under oilseeds, crops which are primarily grown in the state are rapeseed, mustard, and groundnut. Table below indicates that except for ground nut, area under other oilseeds has increased significantly during the study period. Out of all oilseed crops, rapeseed, and mustard cover majority of area in the state during reference years as shown in Table-3.

Table-3: Area under Oilseeds in UP

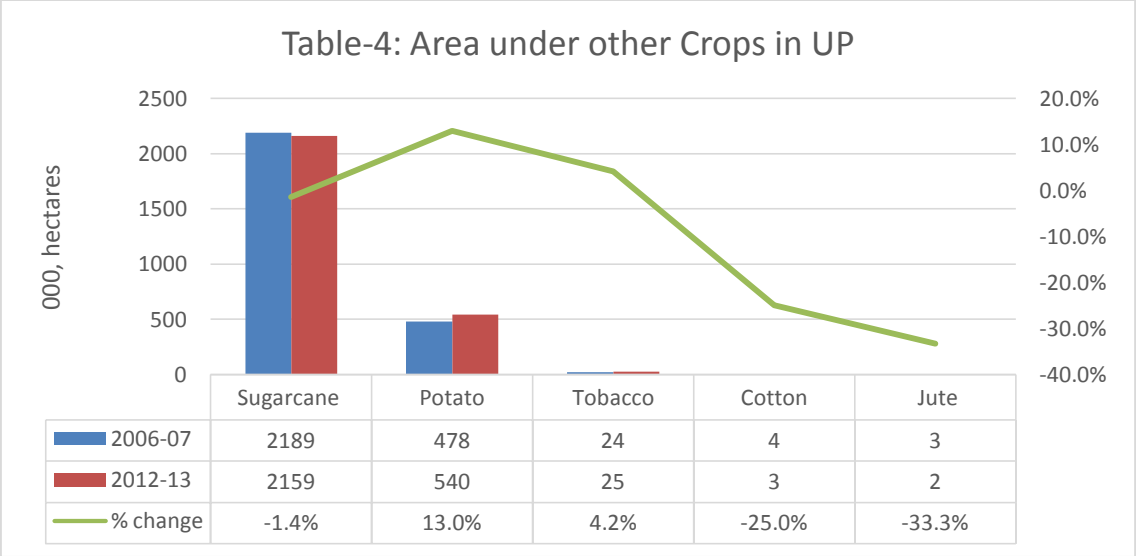


	Rapeseed and mustard	Groundnut	Other Oil seeds
2006-07	573	100	306
2012-13	645	88	364
% change	12.6%	-12.0%	19.0%

Other Crops

State of Uttar Pradesh is known for sugarcane and potato production in the country. It is evident from the data shown in the table below. During the study period, area under sugarcane has seen minor dip while area under potato has increased in percentage terms.

Tobacco is another crop, which has covered more area under it in the year 2012-13 than in the year 2006-07. Area under crops like jute and cotton has marginally reduced during the period, as per Table-4.



	Sugarcane	Potato	Tobacco	Cotton	Jute
2006-07	2189	478	24	4	3
2012-13	2159	540	25	3	2
% change	-1.4%	13.0%	4.2%	-25.0%	-33.3%

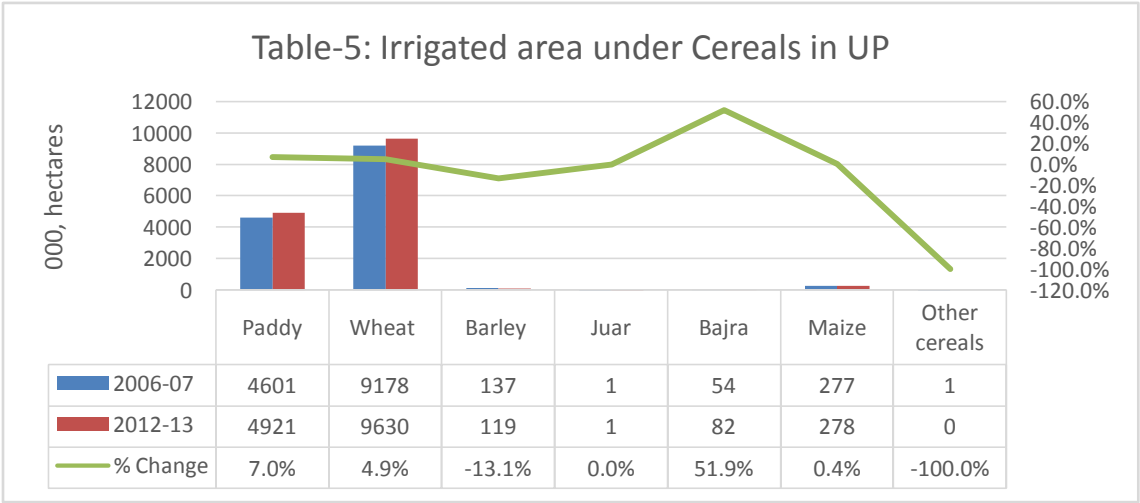
Irrigated area under principal crops in UP

The state of Uttar Pradesh has witnessed changes in irrigated area under different crops during the study years. Major crops and area under them is classified as below:

1. Irrigated area under cereals
2. Irrigated area under pulses
3. Irrigated area under oilseeds
4. Irrigated area under other major crops

Cereals

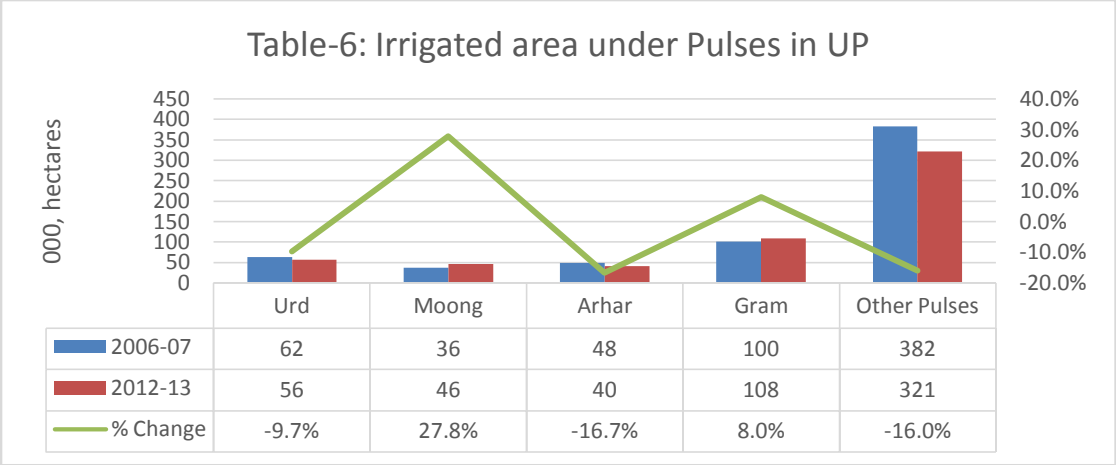
Irrigated area for main cereal crops of paddy and wheat has increased by 7.9% and 4.9% respectively from the year 2006-07 to 2012-13. Overall, in the state, irrigated area for cereals has increased for all major cereals except for barley which has seen reduction by 13% as per Table-5.



	Paddy	Wheat	Barley	Juar	Bajra	Maize	Other cereals
2006-07	4601	9178	137	1	54	277	1
2012-13	4921	9630	119	1	82	278	0
% Change	7.0%	4.9%	-13.1%	0.0%	51.9%	0.4%	-100.0%

Pulses

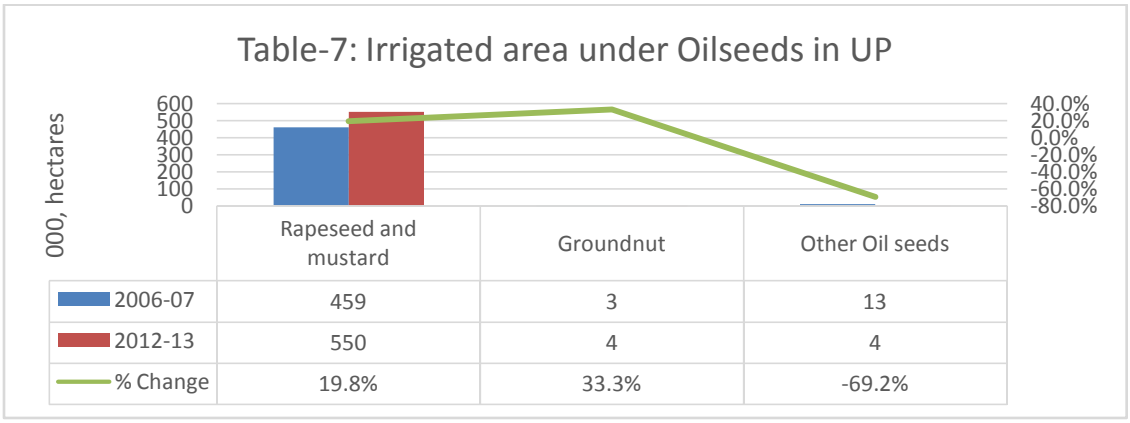
Pulses are sown in the state in a big way as they fetch good income for farmers. The study shows that irrigated area for moong has increased by 27.8% from the year 2006-07 to 2012-13 while gram has seen increase by 8% in irrigated area. For all other pulses, irrigated area has decreased, ranging from 9.7% for urd to 16.7% for arhar in the same period as per Table-6.



	Urd	Moong	Arhar	Gram	Other Pulses
2006-07	62	36	48	100	382
2012-13	56	46	40	108	321
% Change	-9.7%	27.8%	-16.7%	8.0%	-16.0%

Oilseeds

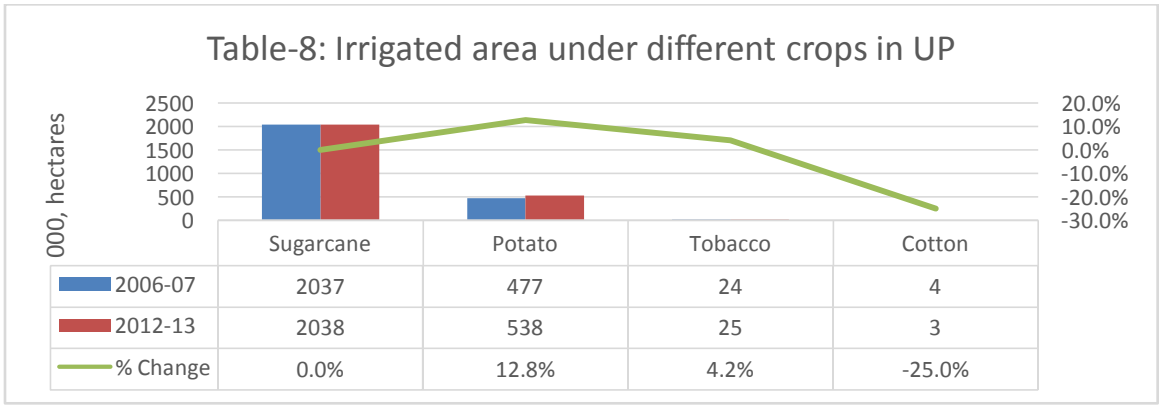
For crops under oilseed category, considerable increase in irrigated area for rapeseed, mustard and groundnut is evident from the data presented in the table. While for gram, increase is by 33.3% from 2006-07 to 2012-13, it is 19.8% for rapeseed and mustard in the sameperiod. For other crops under oilseed category, area has decreased significantly. The decrease is by 69.2% during the studied period as per Table-7.



	Rapeseed and mustard	Groundnut	Other Oil seeds
2006-07	459	3	13
2012-13	550	4	4
% Change	19.8%	33.3%	-69.2%

Other Crops

Other major crops of state like sugarcane, potato, irrigated area is keep fluctuating significantly. However, during the period under study, no change is reflected for sugarcane. But irrigated area hassignificantly increased by 12.8% for potato from 2006-07 to 2012-13. Cotton has seen major dip by 25% whereas, tobacco has seen a marginal increase of 4.2% from 2006-07 to 2012-13 as shown in Table-8.



	Sugarcane	Potato	Tobacco	Cotton
2006-07	2037	477	24	4
2012-13	2038	538	25	3
% Change	0.0%	12.8%	4.2%	-25.0%

Production of principal crops in UP

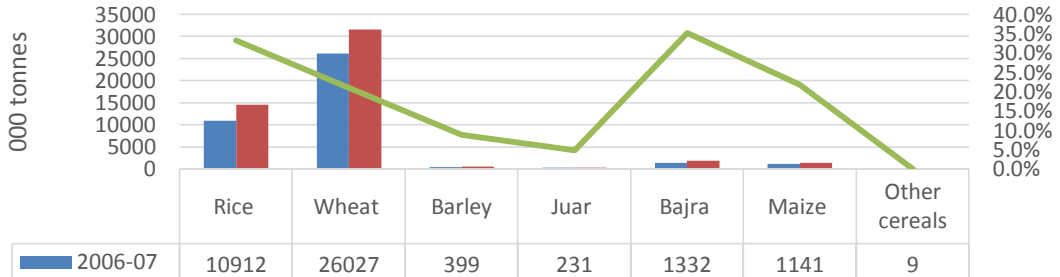
During the period from 2006-07 to 2012-13, the state has seen increase in production of almost all principal crops in all categories grown. For better representation, study has been classified as below:

1. Production of cereals in UP
2. Production of pulses in UP
3. Production of oilseeds in UP
4. Production of other major crops in UP

Cereals

Under cereal category of crops, all crops have seen increase in their productions from the year 2006-07 to 2012-13. The highest being for bajra by 35.1%, followed by rice by 33.2%, maize by 21.8%, wheat by 20.9%, barley by 8.8%, and for juar by 4.8% as shown in Table-9.

Table-9: Production of Creals in UP

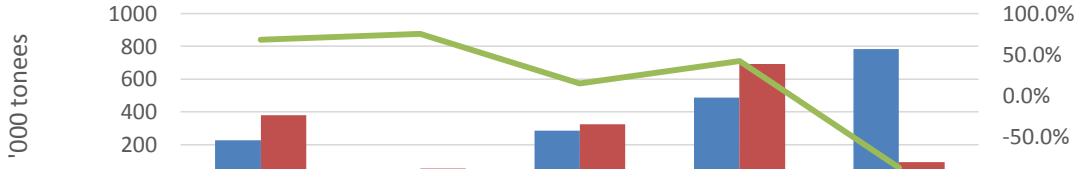


	Rice	Wheat	Barley	Juar	Bajra	Maize	Other cereals
2006-07	10912	26027	399	231	1332	1141	9
2012-13	14536	31476	434	242	1800	1390	9
% Change	33.2%	20.9%	8.8%	4.8%	35.1%	21.8%	0.0%

Pulses

Likewise, pulses have seen significant increase in their production per hectare in the state. Moong has seen the highest jump in production. It has registered 75% increase from 2006-07 to 2012-13 followed by 67.7% for urd, 41.9% for gram and 14.4% for arhar. Other pulses were down by 88% as per Table-10.

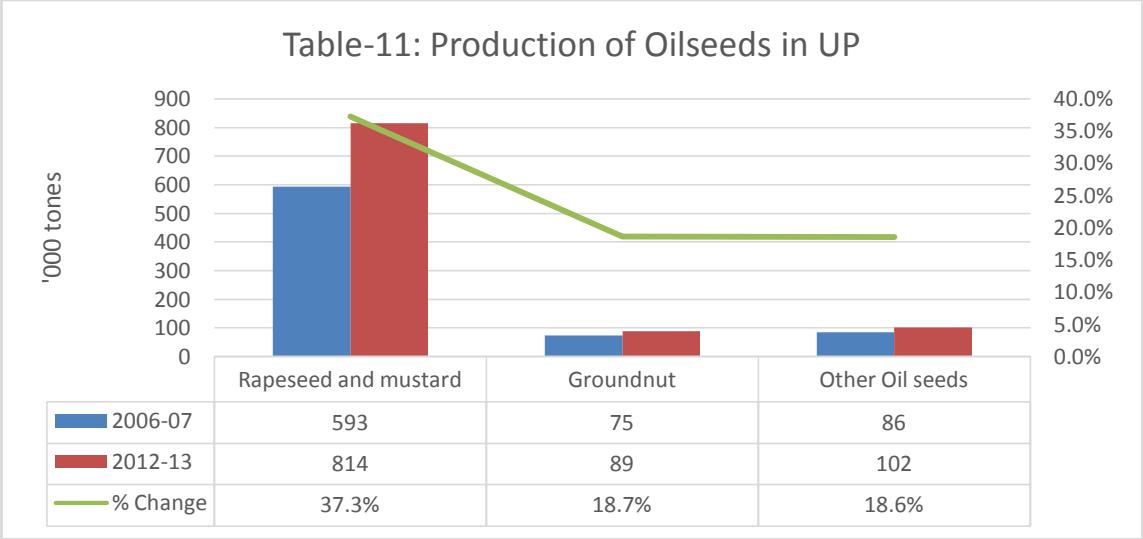
Table-10: Production of Pulses in UP



	Urd	Moong	Arhar	Gram	Other Pulses
2006-07	226	32	285	487	784
2012-13	379	56	326	691	93
% Change	67.7%	75.0%	14.4%	41.9%	-88.1%

Oilseeds

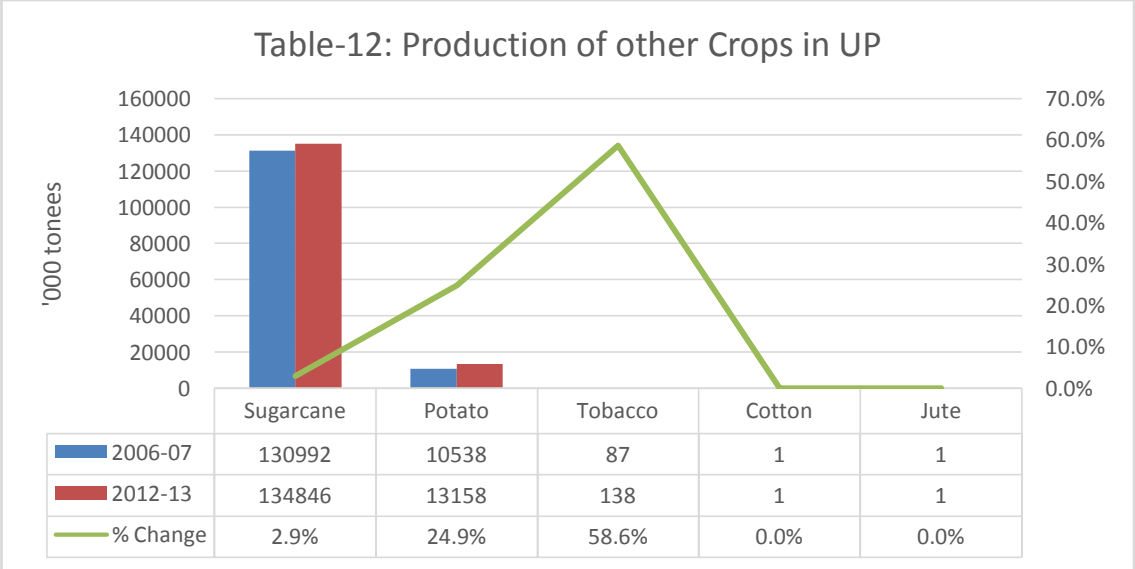
The increasing trend in production is evident even for crops under oilseeds category. The highest being for rapeseed & mustard which has seen increase of 37.3% in the period from2006-07 to 2012-13. In the same period, groundnut production increased by 18.7% and other oilseeds by 18.6% as pr Table-11.



	Rapeseed and mustard	Groundnut	Other Oil seeds
2006-07	593	75	86
2012-13	814	89	102
% Change	37.3%	18.7%	18.6%

Other Crops

Sugarcane, potato, cotton, and tobacco which are the other principal crops grown in the state have also seen increase in the production. Potato has witnessed increase of 24.9% from 2006-07 to 2012-13, tobacco 58.6%, sugarcane 2.9%. There is no change in production of jute and cotton during the same period as per Table-12.



	Sugarcane	Potato	Tobacco	Cotton	Jute
2006-07	130992	10538	87	1	1
2012-13	134846	13158	138	1	1
% Change	2.9%	24.9%	58.6%	0.0%	0.0%

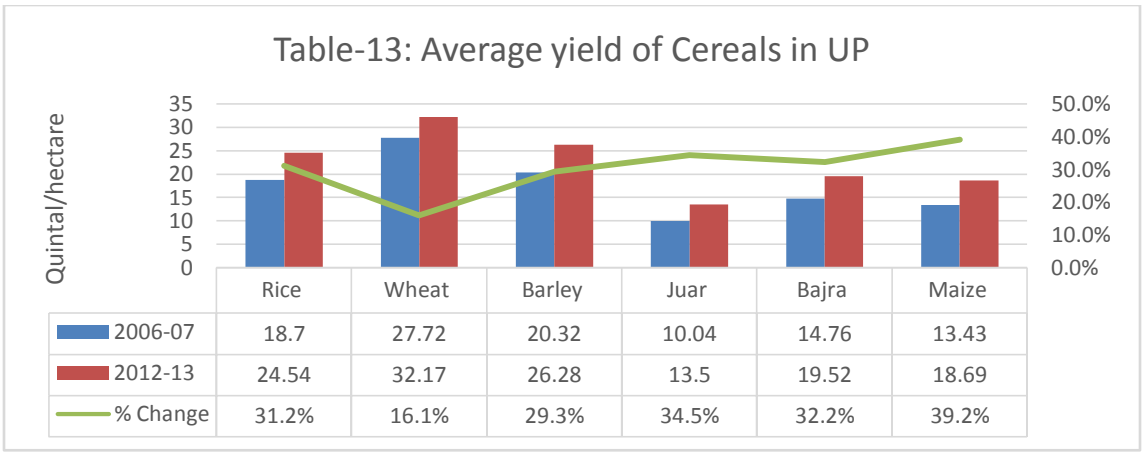
Average yield of crops in UP

In the study, it is found that modern agriculture practices have made a good impact on average yield of almost every crop, grown in the satte. For the period under study, average yield analyses have been done for all major categories of crops as mentioned below:

1. Average yield of cereals in UP
2. Average yield of pulses in UP
3. Average yield of oilseeds in UP
4. Average yield of other major crops in UP

Cereals

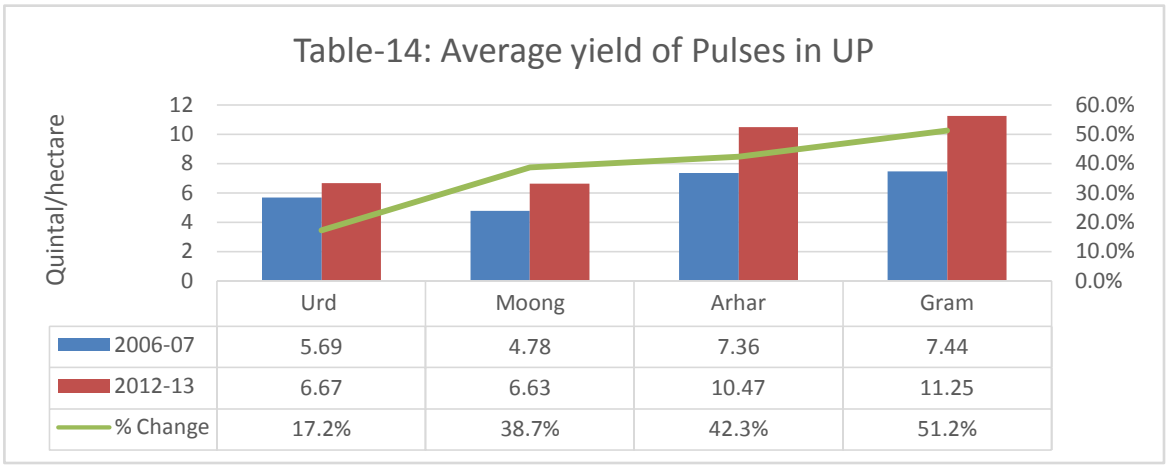
In the period from 2006-07 to 2012-13, average yield of all crops under cereals category in Uttar Pradesh have seen significant increase, maximum for maize with 39.2%. Juar, bajra, rice, barley and wheat have seen increase by 34.5%, 32.2%, 31.2%, 29.3% and wheat 16.1% increase respectively in average yield in the state as per Table-13.



	Rice	Wheat	Barley	Juar	Bajra	Maize
2006-07	18.7	27.72	20.32	10.04	14.76	13.43
2012-13	24.54	32.17	26.28	13.5	19.52	18.69
% Change	31.2%	16.1%	29.3%	34.5%	32.2%	39.2%

Pulses

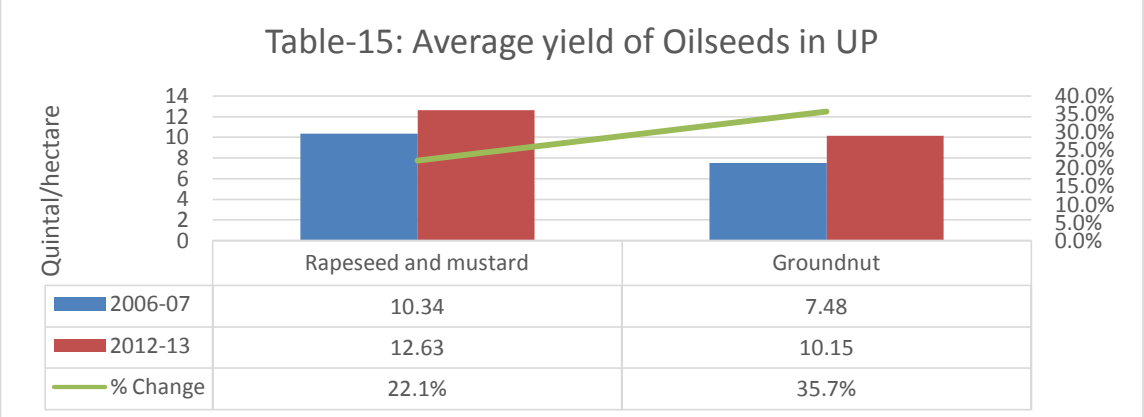
In the period from 2006-07 to 2012-13, average yield of all crops under pulses category in Uttar Pradesh have seen significant increase, maximum for gram with 51.2%. Average yield of other pulses, namely, arhar, moong and urd has increased by 42.3%, 38.7% & 17.2% respectively as shown in Table-14.



	Urd	Moong	Arhar	Gram
2006-07	5.69	4.78	7.36	7.44
2012-13	6.67	6.63	10.47	11.25
% Change	17.2%	38.7%	42.3%	51.2%

Oilseeds

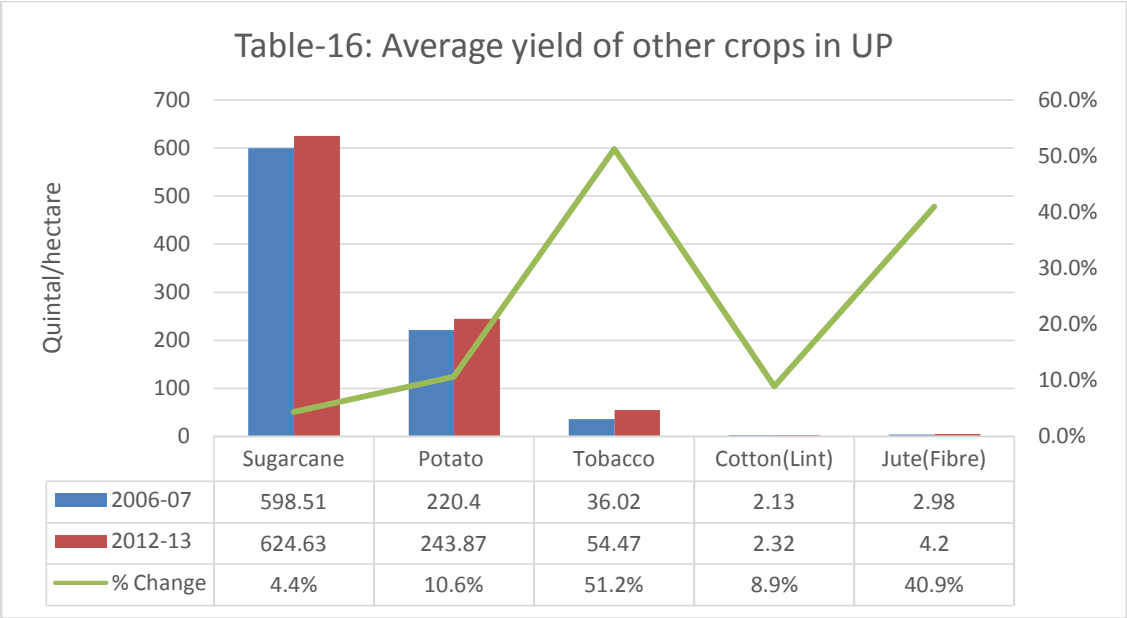
In the period from 2006-07 to 2012-13, average yield of all oilseeds have seen considerable increase in their average yield in Uttar Pradesh. Average yield of groundnut has increased by 35.7% whereas rapeseed & mustard has seen increase of 22.1% during the study period as per Table-15 below.



	Rapeseed and mustard	Groundnut
2006-07	10.34	7.48
2012-13	12.63	10.15
% Change	22.1%	35.7%

Other Crops

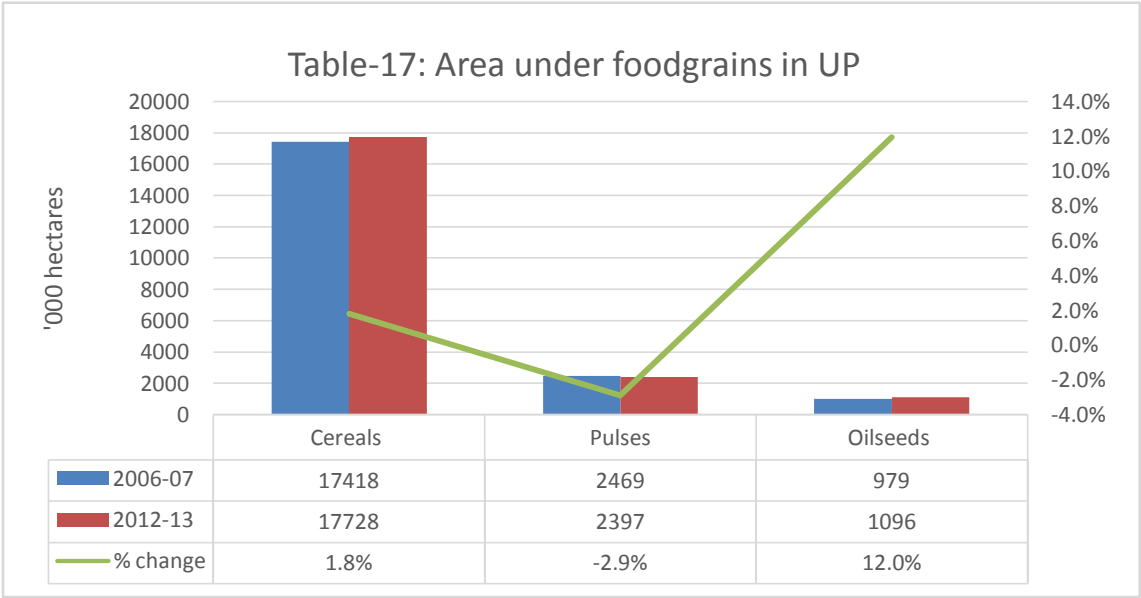
As seen for crops in different categories as mentioned above, major other crops like sugarcane, potato, cotton and jute have also witnessed increase in their average yield in the state of Uttar Pradesh from 2006-07 to 2012-13. In percentage terms, the highest increase is for tobacco with 51.2%, followed by jute 40.9%, potato 10.6%, cotton 8.9% and sugarcane 4.4.% as per Table-16.



	Sugarcane	Potato	Tobacco	Cotton(Lint)	Jute(Fibre)
2006-07	598.51	220.4	36.02	2.13	2.98
2012-13	624.63	243.87	54.47	2.32	4.2
% Change	4.4%	10.6%	51.2%	8.9%	40.9%

Overall change in production of food grains

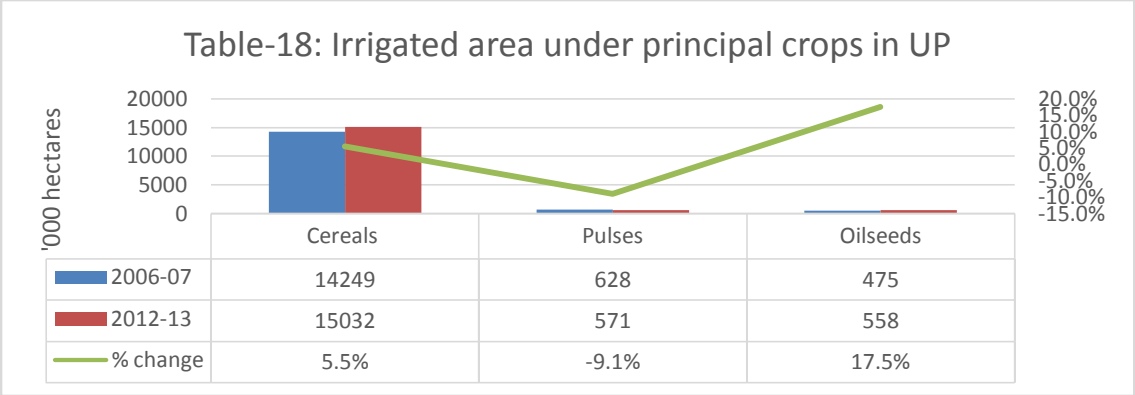
In the period from 2006-07 to 2012-13, cereals, and oilseeds have seen increase in their area of cultivation by 1.8% and 12 % respectively, except for pulses in the state. Area under pulses has decreased by 2.9% as shown in the Table-17.



	Cereals	Pulses	Oilseeds
2006-07	17418	2469	979
2012-13	17728	2397	1096
% change	1.8%	-2.9%	12.0%

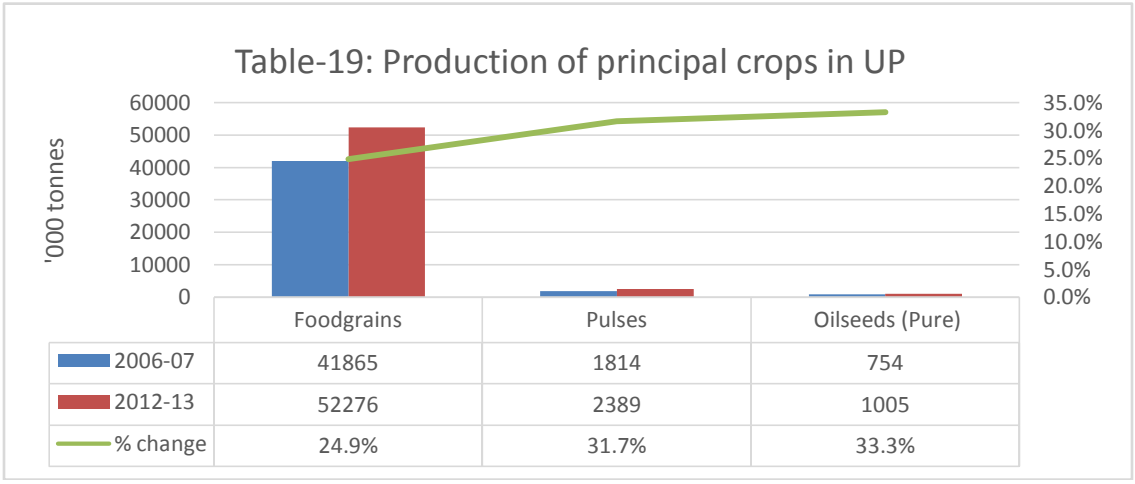
Overall change in irrigated area of food grains

In the period from 2006-07 to 2012-13, cereals, and oilseeds have seen increase in their irrigated area of cultivation by 5.5% and 17.5% respectively, except for pulses in the state. Irrigated area under pulses has decreased by 9.1% as shown in the Table-18 below.



Overall change in production of food grains

In the period from 2006-07 to 2012-13, all food grains have seen significant increase in production, led by oilseeds by 33.3% followed by pulses by 31.7%. Overall food grains production has increased by 24.9% during the period in the state of Uttar Pradesh as per Table -19.



Conclusion:-

The paper has studied how different factors like area of cultivation, irrigated area for different crops have impacted production of different category crops in the state of Uttar Pradesh from the year 2006-07 to 2012-13. It has been found that most of the crops have seen increase in their area of cultivation and irrigated area. This increase in areas have positively impacted the absolute production and their average yield. Another facet which could be seen is that those crops which can make farmers earn more money are being grown more. It can be concluded from the study that there hasbeen significant change in the cultivation of different types crops in the state. This could be primarily due to increase in area of cultivation and irrigated area. Shift to such crops which can command more earning for farmers is visible in almost all categories, namely cereals, pulses, oilseeds, and other major crops in the state of Uttar Pradesh during the studied period.

Suggestions:-

From the present study, following submission can be made for acceptance by different players involved in agriculture in the state of Uttar Pradesh.

1. Governments at all levels whether central, state, or local govt bodies should continue giving due thrust to modern day agriculture practices.
2. Governments should also provide due support to farmers for cultivation of all those crops which are not sown by farmers as not helping them increase their earnings.
3. Irrigation sources might have changed the landscape. But it may be a fact that farmers are arranging water for their agricultural needs by their own manged sources. Governments at central and state should go for big way in

constructing canals and last filed availability of water. Second, they should ensure regular electricity to private and other tube wells so that cost of farming is reduced, farmers can increase their profit.

4. Governments should take steps to make farming a full-time occupation to ensure increase of production of various crops to feed increasing population.
5. Efforts should also be made to bring more & more area under irrigation so that multiple crops can be grown by farmers for income opportunity in the state.

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