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Analytical Study on Effect of Production and Productivity of Agriculture by the Inputs

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Abstract – An incredible dominant part of nations actualizes horticultural input endowments as a device to help farming productivity and output. In any case, despite the fact that this training spread and speaks to a vast piece of the rural spending plan, little accentuation has been set on the assessment of the viability of such plans. The paper intends to examine the effect of Agricultural inputs on Agricultural production and productivity utilizing A Simple Regression Analysis for the period 1980-1981 to 2015-2016. Agrarian inputs take as fertilizers, net watered area, pesticides, power, rainfall and utilization of HYV seeds. The investigation uncovers that the variables like fertilizers and net watered area are not statistically significant, which implies they do not significantly affect rural production and productivity amid the timeframe 1980-1981 to 2015-2016. The investigation further uncovers that the variables like pesticides, power, rainfall and seeds are statistically significant and it induced that these variables significantly affect farming production and productivity amid the previously mentioned information period. The creators opine that the government can intercede in the working of the horticultural sector both from input side just as from output side.

Keywords – Production, Productivity, Agriculture, Input, Growth, Development

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1. INTRODUCTION

Farming development is a standout amongst the most incredible assets to end extreme poverty, support shared success and feed an anticipated 9.7 billion individuals by 2050. Development in the agriculture sector is two to multiple times increasingly powerful in raising wages among the most unfortunate contrasted with different sectors. Examinations found that 65% of poor working adults brought home the bacon through agriculture. Agriculture is additionally significant to monetary development: in 2014, it represented 33% of worldwide total national output (GDP). Agriculture is the science or routine about cultivating, including development of the dirt for the developing of yields and the raising of creatures to give nourishment, wool, and different items while agrarian Productivity is increment in per capita output of horticultural produce. To address the issues of a total populace expected to achieve nine billion by 2050, farming production should increment by something like 60 percent. Because of its relative significance and future additions, it is-known to be a noteworthy source of crude materials for handling enterprises in the manufacturing of completed merchandise and ventures. It delivers about 80% of all manufacturing businesses' crude materials utilized in the production of completed merchandise in many economies of the world. For a long time, productivity has been a key issue of farming development methodologies due to its effect on monetary development and development. It is additionally a well-established fact that the most effortless methods through which humanity can escape poverty to a state of relative material affluence is by expanding rural productivity. Productivity upgrades make the riches that can be utilize to address the issues of things to come.

1.1 Production

Agricultural production relies upon common conditions, factor input, and the overarching dimension of innovation. Regular conditions for agricultural production are not controllable, so the examination of affecting factors of agricultural land is focuses for the most part on factor input, specialized dimension, and other circuitous factors. The agricultural populace maturing worries in this paper are among the roundabout factors. Agricultural production requires work input, yet in addition technological development. From one perspective, a maturing agricultural production needs innovation to adjust for physical inadequacy. Then again, nonfarm payrolls make the open door cost of agricultural work input substantial. This may slant them to put resources into the utilization of apparatus rather than work input.

1.2 Productivity

Productivity has been characterizing as the proportion of output to input. An expansion in productivity implies an increment in output that is relatively more prominent than increment in input.

Productivity is the proportion between output and input. It is quantitative connection between what we produce and what we have spent to produce. 70-Productivity is only decrease in wastage of resources like men, material, machine, time, space, capital and so forth. It very well may be communicated as human endeavours to produce increasingly more with fewer and fewer inputs of resources so that there will be greatest conveyance of advantages among most extreme number of individuals. Productivity signifies connection among output and one or all associated inputs

1.3 Production and Productivity Growth in Agriculture

While assessing the execution of a production unit or the agricultural sector, usually to utilize production (the dimension of output), productivity (output per unit of input) or effectiveness (real output in respect to the potential output or best practices) as pointers. Despite the fact that these measures are firmly related, they can yield diverse rankings in estimating execution. As a rule, productivity is the most normally utilized measure, be it quantified as far as absolute factor productivity (TFP) or in fractional terms, for example, work productivity (output per work) and yield (output per hectare) for its relative straightforwardness in calculation and interpretation.

In the accompanying areas, changes after some time in output and productivity development in various locales are analysing and the reasons for varieties are talk about.

1.4 Agricultural Development and Input Use

Agricultural output and productivity fluctuate incredibly with the stage of monetary development, resource blessings, government approach and agronomic-ecological conditions. In any case, there is a comparative way in agricultural development after some time and crosswise over nations. Pingali and Heisey (1996) arranged the technological transformation of crop production system into three distinct phases:

- The Land-Augmentation Phase;
- The Labour-Substitution Phase; And
- The Knowledge- And Management-Intensity Phase.

The fundamental supposition is that the progress starting with one stage then onto the next is dictating by developing factor shortage, first for land, at that point for work lastly for different factors of production, for example, machinery and the board aptitudes.

The principal stage is portraying by area development being the principle source of output development, as was seen amid the pre-Green Revolution time of the 1960s. In any case, as opportunities for area development decrease after some time, trimming force is expanding, alongside expanding utilization of water, fertilizers, pesticides and high yielding assortments. This was undoubtedly the situation amid the Green-Revolution period during the 1970s and mid-1980s. Such concentrated production results in an expanded interest for work and automation, as the production framework moves from single editing to twofold and triple trimming with expanded utilization of bought inputs.

Inevitably, production achieves the purpose of diminishing minimal comes back to encourage intensification, just like the case in the late 1980s, the post-Green Revolution stage. Here, better specialized learning and the executive's aptitudes are utilizing to substitute for conventional inputs. Assortment choice, manure timing and position, water the board and pesticide application are a few areas in which productivity has improved with decrease in unit cost of production.

The model simply laid out is utilizing in the accompanying investigation as the essential structure to clarify the adjustments in input use and in productivity between the 1960s and the 1990s. In the first place, it is connecting to different locales on the planet, at that point to the creating and created nations, lastly to the chose nations in Asia and the Pacific.

1.5 Factors Affecting Productivity Growth

In clarifying productivity development, financial analysts initially constrained themselves to the role of conventional inputs, for example, land, work, physical capital, water and synthetic inputs. In any case, the inability to clarify productivity development sufficiently driven them to examine the role of human capital and public merchandise, for example, education, agricultural research and expansion and publicly given framework. Public policies that have a solid connect to agricultural productivity, for example, arrangement changes additionally examined.

The reason for considering research is the conviction that interests in research result in increments in the load of learning, which, thusly, either encourage the utilization of existing information or produce innovation. Technological advances, in the case of coming about because of changes in input quality or how inputs are consolidating, lead to productivity gains. Education, preparing and expansion additionally increment productivity by expanding individuals' information and skill base, which are

basic for innovation appropriation and proficient utilization of inputs. Public foundation, then again, builds productivity by facilitating the trading of merchandise and ventures.

- Technological Change- It alludes to the adjustments in the production procedure that happen from the use of development and recently obtained logical learning and specialized and the board skills. Technological change increments agricultural productivity either by moving the production outskirts upward so progressively estimated output can be produced with a similar measure of inputs or by drawing nearer to the production wilderness.

- Agricultural Research and Extension- Numerous scientists have investigated the roles of research and augmentation in advancing agricultural growth. Rosegrant and Evenson (1992) found that in South Asia, public research represented 30 percent of the output growth, and expansion for around 25 percent, with comparing rates of return being 63 percent and 52 percent, separately. In spite of the high rates of profits from public research ventures, agricultural research force (ARI), estimated as a level of Chinese agricultural GDP, was found to have declined from 0.56 percent for the period 1958-1965 to 0.43, 0.44, 0.39 and 0.40 percent, individually.

- Human Capital - Human capital alludes to learning, knowledge and skills controlled by individuals associated with the production procedure. It is affecting specifically by education, preparing and augmentation. Its importance lies in the fact that it significantly affects the selection and the use of innovation, which thusly, influence the portion of resources and productivity. The idea of investment in human capital spreads not just investments in formal tutoring and post-school and hands on preparing, yet additionally investment as improved wellbeing and family care.

- Policy Reform and Prices- The importance of arrangement change has progressively seen as crucial for agricultural productivity gains, particularly for nations where government intercession in agriculture has been solid. Evacuating market mutilations and permitting market signs to be transmitted to producers is the principle goal of basic alteration programs by global associations for economies experiencing significant change and nations under water. Land change and most land policies, which appoint property rights to clients with the goal that effective and dependable utilization of resources can occur, are different situations where changes in approach can significantly affect productivity.

- International Trade- Encouraged by enhancements in transportation and communication technology, exchange has additionally been critical in diffusing new items and new advances. It is likewise certain that opening of economies is unequivocally associated with fast financial growth. An a valid example is the fast post-war growth of the most unique Asian nations, for example, Japan, South Korea and Taiwan, and the low growth of internal looking economies, for example, China (before the open-entryway arrangement) and India.

- Natural Resources - Regular resources are basic determinants of sustenance supply. Debasement of characteristic resources, for example, land and water, undermines production limit and compromises the maintainability of the normal biological community. Land corruption has been serious in the previous couple of decades. It was discovering that since 1945, around two thousand million of the world's 8.7 thousand million hectares of agricultural land, changeless fields, backwoods and forest has been corrupting through wrong agricultural works on, overgrazing and deforestation.

2. REVIEW OF LITERATURE

Kate & Leigh, (2010) - Investments in productivity increments higher up the sustenance esteem chain, for example, through advertising and transportation foundation, would build costs ranchers get for output while additionally putting descending weight on urban nourishment costs. Higher producer costs would make motivations for ranchers to put resources into productivity expanding advances since output increments would offer generous gains.

Paul et al. (2012) - agricultural production and closeness (as estimated by movement time) to urban markets are exceedingly associated in Sub-Saharan Africa, even in the wake of considering agro environment. As per IFPRI (2012) poor resource blessings, negligible utilization of inputs (manure, improved seeds, and water system), and unfriendly policies that proceeded for an extensive stretch have been distinguished as the real reasons for the low and declining execution of the agricultural sector in SSA. Proceeding with ecological debasement, high populace growth, and low dimensions of investment in agricultural framework

additionally bother the resource impediments of agriculture in Africa.

AfDB, (2012) - The agricultural sector, which represents 80% of business, remains a key source of growth. In 2011 the sector developed by 9%, driven by oat production which achieved a record high of 19.1 million tons in 2011. Agricultural production is helping by ideal climate conditions in oat developing areas, upgraded government bolster services to smallholders, improvement in yields and extension in the area under development. Increments in productivity are essentially in charge of expanded yields, as opposed to expansion of the developed area. This is predictable with the government's huge push to advance and convey technology bundles to smallholders.

Urgessa Tilahun Bekabil (2014) - Agricultural production in Ethiopia is described by subsistence introduction, low productivity, low dimension of technology and inputs, lack of foundations and market organizations, and extremely powerless against rainfall inconstancy. Productivity execution in the agriculture sector is basic to progress in largely monetary prosperity in Ethiopia. Low accessibility of improved or half and half seed, lack of seed duplication limit, low benefit and effectiveness of manure, lack of water system development, lack of transport foundation, detachment of market and predominance of land corruption, unfertile soil, overgrazing, deforestation and desertification are among the requirements to agricultural productivity amid last period. Nevertheless, in 2011 the sector developed by 9% driven by oat production which achieved a record high of 19.10 million tons in Ethiopia. Watchwords: Challenges, Prospects, Agricultural Production, Productivity, Ethiopia

3. OBJECTIVES OF THE STUDY

1. To define the concept of production, productivity, agricultural development and production growth

2. To determine the technological, human, agricultural, human, international and legal changes.

3. To understand the production growth of agriculture in India

4. To analyse the effect of various inputs on the agricultural production and productivity in India

5. To identified the various Trends in Agricultural Inputs of India

4. RESEARCH METHODOLOGY

4.1 Sources of Data collection

The investigation has utilized auxiliary information from various information sources like RBI, Hand Book of Statistics on Indian Economy, Economic Surveys, Agricultural Statistics initially and FAOSTAT and so on for examination.

4.2 Inputs used in this study

The paper uses the data for variables such as fertilizer consumption, net irrigated area, pesticides consumption, electricity consumption and HYV seeds consumption.

Agriculture GDP= β1+ β2 fertilizers+ β3 net irrigated area+ β4 pesticides+ β5 electricity+ β6 rainfall+ β7 seeds+ μ.

The Agriculture GDP growth rate is taking as the reliant variable and growth in fertilizers, net inundated area, pesticides, power, rainfall and HYV seeds are taking as independent variables.

β1 = Constant term (When value of all the independent variables are zero, the value of agriculture GDP). β2 = Unit/% change in agriculture GDP due to 1 unit/% increase in fertilizers. β3 = Unit/% change in agriculture GDP due to 1 unit/% increase in net irrigated area. β4 = Unit/% change in agriculture GDP due to 1 unit/% increase in pesticides. β5 = Unit/% change in agriculture GDP due to 1 unit/% increase in electricity. β6 = Unit/% change in agriculture GDP due to 1 unit/% increase in rainfall. β7 = Unit/% change in agriculture GDP due to 1 unit/% increase in seeds.

Here μ speaks to the various variables that have not been incorporating as independent variables because of inaccessibility of information in the given period. Our procedure will include the minimization of the blunder term to keep away from omitted variable inclination.

Mistake term essentially demonstrates the nearness of each one of those variables that has not been taking because of reasons like inaccessibility of information and so on. However, they affect the needy variable. Therefore, as a specialist, to stay away from false relapse, we ought to diminish the blunder term by taking the same number of variables as control variables, which thusly will give us exact and fair outcomes. Here in our paper we have managed the mistake term by taking the same number of control variables that impacts the reliant variable inputs utilized , which will improve our expectation, decrease our blunder term and make it near zero and maintain a strategic distance from the issue of exclude ted variable predisposition, as referenced prior.

4.3 Statistical Tools used in this study

A basic relapse investigation has been use here to set up connection between agriculture GDP growth and growth in different inputs required in production process.

5. DATA ANALYSIS AND RESULT

5.1 Progress of Agricultural Sector in Indian Economy

Table 1 gives data on the absolute populace in the nation and different class's agricultural specialists rely upon agricultural sector since 1951. Air conditioning cording to the Census of 1951, the number of inhabitants in the nation was 361.1 million. From that point forward, in a time of 60 years the number of inhabitants in the nation has expanded by in excess of 850 million. It is obvious from the above table that the rate of growth of populace amid 1951-1961 was 1.96 percent for every annum and further expanded to 2.20 percent per annum amid 1961-1971. The 1991 evaluation additionally shows that the yearly rate of growth of populace amid the 1980s was 2.16 percent. The yearly rate of growth rate of populace has boiled down to 1.97 percent amid 1991-2001 and further tumbled to 1.50 percent amid 2001-2011. The extent of provincial populace to the all-out populace has demonstrated a declining pattern since 1951. The extent of rustic populace to the all-out populace has been diminish from 82.7 percent in 1951 to 68.9 percent in 2011.

Table 1. Population and agricultural workers (In Millions).

Year	Total Population	Average Annual Exponential	Rural Population	Total workers	Agricultural Workers		
					Cultivators	Agricultural Laborers	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1951	361.1	1.25	298.6 (82.7)	139.5	69.9 (71.9)	27.3 (28.1)	97.2 (69.7)
1961	439.2	1.96	360.3 (82.0)	188.7	99.6 (76.0)	31.5 (24.0)	131.1 (69.5)
1971	548.2	2.20	439.0 (80.1)	180.4	78.2 (62.2)	47.5 (37.8)	125.7 (69.7)
1981	683.3	2.22	525.6 (76.9)	244.6	92.5 (62.5)	55.5 (37.5)	148.0 (60.5)
1991	846.4	2.16	630.6 (74.5)	314.1	110.7 (59.7)	74.6 (40.3)	185.3 (59.0)
2001	1028.7	1.97	742.6 (72.2)	402.2	127.3 (54.4)	106.8 (45.6)	234.1 (58.2)
2011	1210.8	1.50	833.7 (68.9)	481.9	118.8 (45.1)	144.3 (54.9)	263.1 (54.6)

Source: Registrar General of India.

Note: (1) Figures within parentheses in col.4 are percentages to the total population; (2) Figures within parentheses in col.6 and 7are percentages to col.8; (3) Figures within paren- theses in col.8 are percentage share of Agricultural workers in Total Workers been expanded considerably from 135.9 m millions of every 1951 to 481.9 million out of 2011. The reliance on agriculture has brought out by the fact that out of complete laborers 263.1 million has been occupier with (54.6 percent) has been occupy with Agriculture and collaborated exercises in 2011.

In Table 1, the working power in the agricultural sector was dispersing into cultivators and agricultural workers. Amid the year, 2011 there are 118.8 mil-lion cultivators and 144.3 million Agricultural Laborers the nation over. Very well, see it from the table the extent of cultivators in the absolute Agricultural specialists has declined from 71.9% in 1951 to 45.1% in 2011, while the extent of agricultural workers has expanded from 28.1% in 1951 to 54.8% in 2011. It obviously mirrors that many individuals have really moved from being cultivators to being agricultural workers. 2011, Census results demonstrate a fall of around 9 million in cultivators and an expansion of around 38 million in agricultural workers.

Table 2. Yield per hectare of major crops (Kgs per hectare)

Crop	1950-51	1960-61	1980-81	1990-91	2000-01	2014-15	2015-16
Rice	668	1013	1336	1740	1901	2390	2404
Wheat	655	851	1630	2281	2708	2872	3093
Jowar	353	533	660	814	764	953	-
Bajra	288	286	458	658	688	1272	-
Maize	547	926	1159	1518	1822	2557	-
Pulses	441	539	473	578	544	744	652
Total Food grains	552	710	1023	1380	1626	2070	2056
Oilseeds	481	507	532	771	810	1037	968
Cotton	88	125	152	225	190	461	432
Jute	1043	1049	1245	1833	2026	2627	-

Sources: (1) Various Economic Surveys;
(2) RBI, Hand Book of Statistics on Indian Economy 2015-16.

Table 2 gives data on yield per hectare of major crops in India since 1950-1951. Yield per hectare of all sustenance grains has expanded by more than three-and-a-half tomes from 552 kegs per hectare in 1950-1951 to 2016kgs per hectare in 2015-2016. Wheat has been recorded most significant increment since 1950-1951 with its yield expanding from 655 kegs per hectare in 1950-1951 to 3093 kegs per hectare in 2015-2016.Productivity of rice has additionally expanded from 1950-1951 to 2404 kegs per hectare in 2015-2016.Jowar and Bara recorded much slower rate s of growth in productivity. Productivity in heartbeats has appeared frustrating pattern. The productivity of maize and cotton has been expanded considerably because of the reception of cross breed maize assortments and But cotton in re-penny years. It is obvious from the above table that the productivity of Maize ascended from 547 kegs per hectare in 1950-1951 to 2557 kegs per hectare in 2014-2015. It likewise seen from the above table that the normal yield per hectare of heartbeats has become by short of what one percent yearly on a normal since the1950s. The

productivity of jute has additionally expanded from 1043 kegs per hectare in 1950-1951 to 2627 kegs per hectare in 2014-2015.Moreover, the objective in regard of production of oilseeds was possibly surpassed yet there were deficit in acknowledging focuses in aside from of sugarcane, jute, cotton and so forth.

Table 4. Area production and yield of principal crops in India in 2014. (Area- "000" hectares, production- "000" Tonnes, Yield-Kg/Hectare).

Country	Area	production	Yield	Production (%)
1. Paddy				
India	43,900	157,000	3576	21.19
2. Wheat				
India	30,500	95,900	3144	13.16
3. Maize				
India	9258	23,700	2560	2.28
4. Pulses				
India	30,309	19,980	659	25.79
5. Sugarcane				
India	5012	352,000	70,231	18.72
6. Groundnut (in shell)				
India	4685	6557	1400	14.94
7. Tobacco Unmanufactured				
India	433	721	1666	10.04

Source: FAOSTAT (as on 26-12-2016).

Area, Production and productivity levels of various crops in Indian agriculture is presented in the above Table 4. It is observed from the above table that there were wider differences among various inputs on the figures related to area, production and productivity of various crops. India accounted for percent of the total area.

5.2 Trends in Agricultural Inputs

The agricultural growth that India has experienced since autonomy is a result of endeavors to guarantee accessibility and utilization of fantastic seeds of high-yielding assortments; fertilizers; water system; pesticides; ranch machinery and hardware; power and agricultural credit. Preeminent among the agricultural inputs credited for upsetting the agricultural sector are improved seeds and planting materials.

Since freedom, a gigantic measure of investment made for the development of irrigation ventures. In 1950-1951 about 20.9 million hectares of land were inundated which accounted to just 18 percent of the complete edited area. Water and soil are the most vital factors on which agriculture is base.

Because of presentation of various sources of irrigation, irrigation capability of the nation has expanded from 81.1 million hectares in 1991-1992 to108.2 million hectares in March 2011 (Economic Survey 2010-2011).

The accessibility of irrigation at basic periods of harvest growth is a major factor, which determines the quality of yield produce. Around 42 million hectares of land in India has guaranteed irrigation offices. Whatever is left of the agricultural land mostly relies upon monsoon or rainfall.

The utilization of fertilizers in Indian agriculture has gotten a boost after the initiation of high-Yielding Varieties Program me in 1966.The consumption of fertilizers have been expanding from 66,000 tons in 1952-1953 to 125.46 lakh tones in 1990-1991 and in 2014-2015 remained at 255.76 lakh tons. India was risen as the second biggest customer of fertilizers after China. In any case, the imbalanced supplement utilize combined with disregard of organic issue has brought about sustenance lacks in Indian soils. The normal fertilizers consumption in India has in-wrinkled from 69.84 kg per hectare in 1991-1992 to 128.08 kg per hectare in 2014-2015. In the mid-1950s, the consumption of pesticides was immaterial yet in mid 1960s, the utilization of pesticides expanded significantly. The pesticides consumption in 1970-1971 remained at about 24.3 thousand tones and it rose to 57.4 thou-sand tons in 2014-2015.

5.3 Data Analysis and Results

Source	Sum of squares	Degrees of freedom	Mean sum of squares	Number of observations = 36
Model	412.003823	6	68.6673039	F (6, 29) = 6.05
Residual	329.219234	29	11.3523874	Probability > F = 0.0003
Total	741.223057	35	21.177801	R-squared = 0.5558

Inputs	Coefficient	Std Error	t value	*P* value
Fertilizers	−0.0125068	0.0449754	−0.28	0.0783
Net irrigated area	0.000156	0.0004561	0.34	0.0735
Pesticides	−0.0781709	0.0648877	−1.20	0.0238
Electricity	−0.0000741	0.0000838	−0.88	0.0384
Rainfall	0.0430007	0.0076602	5.61	0.000
Seeds	0.0269377	0.0171984	1.57	0.0128
constant	−33.85378	16.66425	−2.03	0.051

GDP = −33.85 − 0.0125fertilizers + 0.00015 net irrigated area − 0.078pesticides − 0.000074electricity + 0.043rainfall + 0.026seeds + μ the model is overall statistically significant (P < 0.05).

R Square value is 0.5558, which means 55.58% of the variation in agricultural GDP is explained by the above-mentioned independent variables.

The variables like fertilizers and net watered area are not statistically significant, which implies they do not significantly affect agricultural GDP amid the timespan 1980-1981 to 2015-2016. The examination further uncovers that the variables like pesticides, power, rainfall and seeds are statistically significant and it is construe that these variables significantly

affect agricultural GDP amid the previously mentioned information period. Pesticides and power have a negative association with agricultural GDP. Rainfall and seeds positively affect agricultural GDP. Because of 1% expansion in pesticides use, agricultural GDP diminishes by 0.078% and because of 1%, expansion in power, agricultural GDP diminishes by 0.000074%. Once more, because of 1% expansion in rainfall, GDP increments by 0.043% and because of 1% increment in seeds use, agricultural GDP increments by 0.026%. The blunder term represents the 45% variety in agricultural GDP that is not clarifying by the above taken independent variables.

5.4 Robustness Tests

Table 5 demonstrates that, all the VIF estimations of the variables are inside the limit dimension of 1 - 10. Thus, we can finish up, by saying that, there exists no Multi-collinear in the relapse demonstrate. There is no direct connection between the independent variables. Next, we apply the Breach Pagan BP test to check for Heteroscedasticity in our relapse display. Our investigation demonstrates that our test measurement has a P esteem under 0.05, and afterward we can close by saying that there is no presence of heteroscedasticity or unequal variance in our model.

Table 5. Values for Variance inflation factor (VIF) for Agriculture GDP.

Variables	Variance inflation factor (VIF)
Fertilizers	1.201
Net irrigated area	1.309
Pesticides	1.216
Electricity	1.177
Rainfall	2.673
Seeds	2.033

Further, we apply Durbin Watson DW test to check for autocorrelation in our model. Our analysis shows that DW test value is nearly 2, which signifies there is no presence of autocorrelation.

So, all the three tests act as a robustness heck for our regression model. Therefore, we can say that our regression results are accurate and unbiased.

Table 6 Units Are % Growth Rates

Year	Fertilizers %	Seeds %	Net Irrigated area%	Pesticides %	Electricity %	Rainfall %	GDP %
1980	0.0993	0.0172	0.0460	0.0444	0.0059	−0.0274	12.9
1981	0.0534	−0.0334	0.0046	0.0638	−0.0116	−0.1349	4.6
1982	0.2070	0.0692	0.0309	0.1000	0.0234	0.3051	−0.3
1983	0.0650	0.0781	0.0047	0.0182	0.1495	−0.1415	10.1
1984	0.0320	0.1347	−0.0066	−0.0714	0.1175	−0.0318	1.6
1985	0.0202	0.0149	0.0168	−0.0385	0.2571	−0.0752	0.3
1986	0.0161	0.0084	0.0076	0.3380	0.1978	0.0061	−0.4
1987	0.2568	0.0089	0.0759	0.1344	0.1024	0.4125	−1.6
1988	0.0478	0.0042	0.0120	−0.0513	0.1332	−0.1591	15.6
1989	0.0845	0.0011	0.0283	0.0417	0.1422	0.0568	1.2
1990	0.0145	0.0070	0.0384	−0.0383	0.1637	−0.1481	4
1991	−0.0452	0.0492	0.0086	−0.0186	0.0815	0.0041	−2
1992	0.0175	0.0310	0.0207	−0.1009	0.1164	0.0890	6.7
1993	0.0969	0.0588	0.0323	−0.0360	0.1217	0.1054	3.3
1994	0.0231	0.0613	0.0076	−0.0016	0.0811	−0.1008	4.7
1995	0.0311	0.0482	0.0320	−0.0841	−0.0200	0.0387	−0.7
1996	0.1314	0.0753	0.0018	−0.0690	0.0860	−0.0083	9.9
1997	0.0377	0.0784	0.0403	−0.0590	0.0652	0.0170	−2.6
1998	0.0757	0.0354	0.0017	−0.0602	−0.0644	−0.0848	6.3
1999	−0.0757	−0.0194	−0.0404	−0.0567	−0.0682	−0.0341	2.7
2000	0.0393	0.0641	0.0314	0.0789	−0.0361	−0.0142	0
2001	−0.0729	0.0679	−0.0534	0.0272	0.0344	−0.1029	6
2002	0.0438	0.1077	0.0586	−0.1511	0.0308	0.2471	−6.6
2003	0.0952	0.1075	0.0381	−0.0080	0.0168	−0.1580	9
2004	0.1055	0.0540	0.0271	−0.0221	0.0196	0.1293	0.2
2005	0.0645	0.2230	0.0313	0.0438	0.0967	0.0172	5.1
2006	0.0424	0.1551	0.0071	0.0511	0.0521	0.0604	4.2
2007	0.1036	0.2053	0.0071	0.0053	0.0345	−0.0692	5.8
2008	0.0633	0.1914	−0.0267	−0.0465	0.1087	−0.2045	0.1
2009	0.0618	0.0787	0.0278	0.3281	0.0576	0.3049	0.8
2010	−0.0118	0.0631	0.0320	−0.0461	0.1154	−0.0109	8.6
2011	−0.0811	0.0630	0.0087	−0.1389	0.0461	−0.0861	5
2012	−0.0413	−0.0384	0.0277	0.3214	−0.0220	0.1382	1.4
2013	0.0447	0.0057	−0.0135	−0.0486	0.0113	−0.1661	4.2
2014	−0.0214	−0.0029	0.0068	0.0253	−0.0056	−0.0203	−0.2
2015	−1.0000	−1.0000	−1.0000	−1.0000	−1.0000	−1.0000	1.1

6. CONCLUSION

From the above talk that it very well may be reasoned that the variables like fertilizers and net inundated area are not statistically significant, which implies they don't significantly affect agricultural production and productivity amid the timespan 1980-1981 to 2015-2016. The examination further uncovers that the variables like pesticides, power, rainfall and seeds are statistically significant and it is construct that these variables significantly affect agricultural GDP amid the previously mentioned information period. Pesticides and power have a negative association with agricultural GDP. Rainfall and seeds positively affect agricultural GDP.

The government can mediate in the working of the agricultural sector both from input side just as from output side. The government can specifically supply the inputs like water, irrigation, power, seeds and fertilizers in sufficient amount at financed cost. Government association is basic for making exportable surplus through sufficient investment on foundation, irrigation, agricultural research and augmentation and so forth.

The approach of shoddy input can be legitimize in the underlying periods of development and that to when the recipients have a place with low-pay

gatherings. The strategy of giving free capacity to the entire cultivating network will likewise have serious results like decay of ground water due to over use of groundwater. The government needs to direct the consumption of ground water levels and enlisting of siphon sets ought to be make necessary with respect to the cultivating network. Water shed tasks just as development of minor irrigation and upkeep of age-old water resources will be putting in the hands of cultivating network.

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