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Agricultural Practices in Pakistan: Sustainability and Food Security in a Post-Pandemic Era

Hamzo Khan Tagar
Post Doctoral Research Fellow European Scientific Institute (ESI) &
Associate Professor of Economics, Government of Sindh
Education Department Karachi, Pakistan

Josué Gutiérrez Barroso
Department of Sociology and Anthropology
Universidad La Laguna Spain

ABSTRACT

The key objectives of the paper are to examine the growth sustainability of Pakistan's agricultural sector in a historical context and its impact on other associated sectors of the economy, particularly on food security. The study also examines major challenges faced by this sector in its growth process making its performance unstable. A descriptive time series analysis is performed on the data obtained from various sources for the period 1951 to 2020. The study finds that the factors like; low investment in this sector, unequal land distributions and utilization of scarce water resources, inadequate supply of major inputs, insufficient infrastructural facilities and unskillful labour force reduce the opportunities for stable agricultural growth in the Indus valley region. It is also evident that duringthe last 70 years period at least ten years of growth was observed instable with negative trends and this phenomenon jolted overall economic indicators that harmed the economic development process at large and impacted food insecurity in Pakistan.

Keywords: Agriculture Practices, Growth Sustainability, Indus valley region, (GDP), Public Policy and Food Security

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INTRODUCTION

The word agriculture derives from the Latin ager (field) and colo (cultivate) signifying, when combined, the Latin agriculture: field or land tillage. "It has a very wide spectrum of activities that are integral to agriculture and have their descriptive terms, such as cultivation, domestication, horticulture, arboriculture, and vegeculture, as well as forms of livestock management such as mixed crop-livestock farming. The term agriculture is occasionally restricted to crop cultivation excluding the raising of domestic animals, although it usually implies both activities.)."(Q.Fuller, 2014)

Agriculture lays down a foundation of economic growth and development within an economy, the sector contributes in terms of providing food and fibre to the human population and livestock and provides essential raw materials used by various industries in the manufacturing sector which produce products with higher value addition. One aspect of contributions made by the agriculture market to the overall economy is through its backward linkages with industries and urban centres such as farmers' expenditures on industrial goods i.e. clothes, furniture, household, utensils, building materials, fertilizers, pesticides, tools and implements. The net transfer of capital from agriculture to the non-farm sector is an important means of growth and development. The transfer of surplus and skilled labour, from agriculture to another sector of the economy is also accelerating the growth and development process of an economy.

The agriculture sector provides an opportunity for international market linkages plus allows the flow of capital goods and technical expertise between the developed and developing emerging markets. It is an important source of saving and investment with its potential for gross domestic product (GDP) growth and its ability to provide food security to its nation and around the world. On a global scale "the agriculture sector has contributed between 4% in the last 20 years in global GDP with the highest value additions of 73% 3.5 trillion USD. Agriculture employed 874 million people in 2020, or 27% of the global workforce, compared with about 1050 million" (or 40%) in 2000.(FAO, 2021)

The importance of this sector is manifold as it feeds the country's people, provides the raw material for industry and is a base for foreign trade since the green revolution to date but still, agriculture and agro-based products are the largest sources of the country's total export earnings. Pakistan exports raw agriculture items along with semi-finished and manufactures agriculture goods. The biggest source of foreign exchange for Pakistan has been through the export of agricultural goods based on the textile, leather and sugar industries. The majority of the population of Pakistan resides in rural areas and earns its livelihood, directly or indirectly, from agricultural activities e.g. crop cultivation, livestock, labour in agriculture, agriculture input supply, transportation of agricultural output to the market etc. Therefore it can be rightly stated that the development of the agriculture sector is synonymous with the development of the country.

BACKGROUND OF THE STUDY

Review of the Literature: Agricultural practices and their growth sustainability with their correlations to another sector of the economy in the context of sustainable economic growth and food security of the country have been studied worldwide.

(Shujie, 2000), demonstrate how agriculture has contributed to China's economic development using both empirical data and co-integration analysis. They have drawn two important conclusions in their empirical study. First, although agriculture's share in GDP declined sharply over time, it is still an important force for the growth and development of the other sectors of the economy. Second, the growth of non-agricultural sectors had little effect on agricultural growth and development. This was largely due to the government's poor policies and their improper implementations in the agriculture sector and less proportion of investment in the rural population.

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(Sunil)criticizes the “neglect” of the agricultural sector's role in the development process of the less developed economies. (Ahmad & (2000), Vol., 39.4,); and (S.Akbar .M and Z. F.Naqvi (2000))have worked in detail on the relationship of two important variables of the economy, exports and growth, grounded in endogenous growth theory tested in the case of Pakistan by applying the same method to conclude the significance of agricultural growth in the economy.

(S . Akbar Zaidi (2005))investigated the agriculture growth trends in Pakistan and he finds out that the agriculture sector's growth and its development are the most dependent on the policies of the government and the political scenario in Pakistan. From the political economy perspective political instability, poor policies toward sustainable agricultural growth and their weak implementations are also the major challenge to sustainable agricultural growth and development destinations.

(Katircioglu, (2006),)analyzes the relationship between agricultural output and economic growth in North Cyprus, a small island that has a closed economy using co-integration. The learned author uses annual data covering the (1975-2002) period, to find the direction of causality in Granger sense between agricultural growth and economic growth. His empirical results suggest that agricultural output growth and economic growth as measured by real gross domestic product growth are in a long-run equilibrium relationship and there is a feedback relationship between these variables. The study also concludes that the agriculture sector still has an impact on the economy although North Cyprus suffers from political problems and drought.

(Lachaal, (2007),), examine the agricultural sector's role in economic growth and its interactions with the other sectors using time-series co-integration techniques. The empirical results from this study indicate that in the long run, all economic sectors tend to move together (co-integrate). But, in the short run, the agricultural sector seems to have a limited role as a driving force for the growth of other sectors of the economy i.e. industries, manufacturing, commodity markets export and services sector to some extent.

The World Bank Report “Agriculture for Development” concludes that the agriculture sector offers pathways to reduce poverty and to provide food security if serious efforts are to be made to increase productivity in the staple foods sector, connect small-holders to rapidly expanding high-value horticulture, poultry, aquaculture and dairy markets, and generate jobs in the rural non-farm economy as soon as possible.. “Agriculture has served as a basis for growth and reduced poverty in many countries, but more countries could benefit if governments and donors were to reverse years of policy neglect and remedy their underinvestment andmisinvestment in agriculture” (Agriculture for Development, 2007-2008)

(Ahmad A. H., 2009)study shows that growth and productivity can be achieved due to applying modern farming methods such as mechanization, land, water, labour and the use of inputs such as certified seed, sufficient fertilizer and pesticide etc. It can be concluded in the context of the above study that Chinese modern farming technology can be used for a better result in the case of Pakistan agriculture to remove the time-barred traditional practice of farming for ages because it is cheap in price and easy to use.(Khan, Unpublished, 2009.), concludes the existence of strong time trends with a significant impact of the investment of 0.5 on the growth of the agriculture sector. Similarly, (Zubairu, 2010)empirical results indicate that the agricultural

sector is contributing higher than the petroleum and manufacturing sectors. The coefficient value of the agriculture sector is 1.7978 which means a 1 unit increase in contribution, gross domestic product GDP will increase by 1.7978 units. However, petroleum is contributing 1.14 units to the GDP which is low compared to the contribution of the agriculture sector.

(Raza, (2012)) have analyzed the role of agriculture in the economic growth of Pakistan. However, regression results show that there is a positive and significant role of agriculture sub-sectors to the economic growth but only the forestry sub-sector should insignificant relationship with gross domestic product GDP.(Olajide, 2012) found a positive causal relationship between gross domestic productgross domestic product(GDP) and agricultural output in Nigeria; however, their study was limited to showing only that agriculture and GDP growth rate are correlated.(Abdul Razzaq Nazish (Corresponding Author), 2013) findings suggested that the agriculture, industry, manufacturing and service sector are significantly affecting the annual gross domestic product (GDP) growth of Pakistan. The result of their study indicates that the agriculture sector is more important than other sectors of the economy of Pakistan.(Zaheer, 2013) results suggest that the growth of the agriculture sector has fluctuated over sixty (60) years in Pakistan.

(Anwer, 2015)have analyzed the role of the agriculture sector share ingross domestic product GDP. The study reveals a positive and significant relationship betweengross domestic product GDP and agriculture in Pakistan. The above-referred studies conclude significant contributionsto other sectors of the economy and are acknowledged with strong and undeniable evidence.

Feed the world(How o feed the World in 2050, 2009) concludes that “Cross country analysis shows that GDP growth originating in agriculture is, on average, at least twice as effective in benefiting the poorest half of a country’s population as growth generated in non-agricultural sectors. Agricultural growth is key for overall growth and development and poverty reduction”. The findings of the above-reviewed studies in detail show that an unstable agriculture growth rate has impactedgross domestic product GDP Growth and affects other sectors of the economy, overall export and investment in the country.

Significance of the selected outline and the Interest of the Authors in the Proposed Study: Pakistan as an agricultural country still has not tapped the potential of the agriculture sector to ensure the food security of more than 200 million people in 2nd decade of the 21st century. The sector should be more focused on by the policy makers because of itsimportant contributionsto the economy.It has also been concluded by two other prominent scholars that “Agriculture provides a base for economic development and expansion of non-agriculture sector depends on agriculture. It helps the low-income country to achieve a higher standard of living and provide scope for the rural sector to combine income distribution objective with development objectives. Agriculture and economic development are interrelated with each other. For the foreseeable future, the economic and social welfare of much of the world's population inhabiting the developing countries will continue to depend upon progress in agriculture”(Keningersent)This is also observed in Pakistan from a farmer's perspective that real estate and other urban centres activities are promoted more in comparison to the agriculture sector. These low intentions of the policymakers are reflected inversely as slow and sometimes negative growth in the agriculture sector which harms overall national economic

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growth and development and created food insecurity in the country. The less importance to this sector will create food insecurity and several other socio-economic problems in the future. The eminent agric- economist(Mellor, 1966)defines its importance as "The Interplay between development means and development objectives are particularly important in the agriculture sector. The initial size and backwardness of agriculture suggest wide scope for the rising gross national product through agriculture development".

The Economic Survey of Pakistan a valuable yearly document insist economists and relevant policymakers develop the robust proposal on the above-titled studies in the long-term public interest as elaborated in the following evidence "Agriculturesector contributes 19.2 percent to the gross domestic product(GDP) and provides employment to around 38.5 percent of the labour force. More than 65-70% of the population depends on agriculture for its livelihood. The agricultural growth rate has been constrained by shrinking arable land, climate change, water shortages, and large-scale population and labour shifts from rural to urban areas. Increasing agricultural productivity, therefore, requires the adoption of new approaches"(Economic Survey Pakistan 2021, 2020). The above referred recent economic survey of Pakistan insists Pakistan's researchersselect the area of the species outlined in the greater public interest and as a need of the hour to work on keeping given the above authors selects the outline "Agricultural Practices in Pakistan: Sustainability and Food Security in a Post-Pandemic Era:". It is also pointed out that the agricultural sector growth and instabilityaremore focused on by scholars of our neighbour country India i.e(Rupa Chand, 2009)(Paltasingh, 2013). (NRV. Ramana Reddy, 8 | August 2020)and several other scholars created a debut on the subject matter. It is the need of the hour to focus this area of the study in Pakistan as a country case studyto fill the gap in thisimportant area and re-address the challenges in the post-pandemic era for sustainable agriculture growth and development in the 21st century.

Objectives of the Study

The specific objectives of this paper were:

i. To the analysis of Pakistan's agricultural practices in a historical context and its contributions towards gross domestic product (GDP) and allied sectors.

ii. To the analysis of the major challenges creating growth instability and impacting food insecurity.

Research Methodology: The mixed explanatory approach has been used to test the hypothesis empirically using time series data of agricultural growth from 1951 to 2020. The simple crosstabs have been used to measure the agriculture growth associations with gross domestic product (GDP) and other allied sectors of the economy with an overview of Pakistan's agricultural practices and performance in the last 70 years in detail. The American Pscylogical associations famous as (APA) approach has been adopted in the refrences/citations used in the study.

DISCUSSIONS AND RESULTS

Past Glory of Agriculture Practices in Pakistan: The Indus valley civilizations are centred in between the hills and sandy desert of the country which is called Pakistan. The hub area used for agriculture farming is mostly situated in mid of the valley on the banks of the Indus River and all rivers of provinces directly fall in Indus which supported friends and foes alike since the very beginning of human history. "This valley is irrigated through an elaborate system of canals

taken from barrages mostly built on Indus and also other rivers. The Indus Valley has been a centre of agriculture for the last 6000 years, about a thousand years before the development of Mohan-jo-Daro. "This assumption is based on the discovery of an agricultural village at the KotDiji (District Khairpur). About 25 miles east of Mohan-jo-Daro, The village is said to be 500 years older than Mohan-jo-Daro"(Rehman)

Scholars agreed that the world's oldest cotton was discovered from Mohan-jo-Daro is evidence valid enough to sustain the assumption that the Indus valley is the home of cotton. The Rig-Veda, Ramayana, Mahabharata and the laws of Manu famous books of sub-continent history also write about cotton cultivation and the cotton textile industry in the region. In 325 – 26 B.C. Alexander the Great entered the Indus valley through the Khyber Pass and conquered great parts of the country. He was surprised when he saw trees of cotton and said, "Is their wool in the tree!!!?" At that time trees of cotton were so tall that cotton was picked while riding on camels. "Inarches, who accompanied Alexander on his invasion of Indus valley, described the dress of the people and reported that the lines from the trees are more shining white than any other lines unless it is that the people being dark make lines appear all the more white" (Bury, 1961).The British ruled here from 1843 to 1947 and promotes textile industries because of the strong cotton belt and potential for other agricultural commodities.

Present Cropping Pattern and Major Crops

The crop sector has enormous potential to influence not only the performance of overall agriculture growth but can serve as an anchor for the food security of the country, particularly after the emergence of a food crisis on the global front. To do so, a shift in emphasis from price to yield is vital. Global integration and changing dietary patterns across regions have caused structural shifts. Agriculture growth in the Indus valley mostly depends on major crops such as wheat, cotton, sugarcane, rice and maize.

Major crops account for more in agriculture value addition and it contributes importantly to the gross domestic product(GDP) of the country. In major crops, the cotton crop is a source of raw materials for the textile industries. Sugarcane crop is a cash crop and it is important for sugar and sugar-related production. On the other hand, wheat and rice staple food crops; the rice crop is a source of foreign exchange earnings item of Pakistan.

Minor crops also play a key role in agricultural sector growth and provide food security to the people residing in hard areas of the country's desert and hilly areas located in far-flung locations of the country. These are included as Gram, Barely and Tobacco. Furthermore, minor crops such as oilseed crops, sunflower, rapeseed, mustard, cottonseed, canola onion, chillies and potato etc. Minor crop shares are also important to the agriculture sector and towards GDP. Figure -01 below shows the copping zones in detail.

Livestock subsector

The livestock sub-sector contributed more than 50 per cent value-addition to the agricultural economy. While gross value addition of livestock was greatly increased as compared to crops. This sector meets the domestic demand for meat, milk, and eggs. Pakistan is the 3rd largest milk producer country in the world. In this sector, more than eight million rural families are engaged in raising livestock. it has the potential to play a key role in global food security and to earn foreign exchange at large in minimum investment with little risk factor.

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Fishery& Forest sub-sector

According to the latest economic survey of Pakistan 2021, this subsector contributed 2% percent in agriculture value addition. Pakistan sells good quality seafood to Malaysia, Thailand, China, the Middle East, Sri Lanka, Japan, etc. The fishery sub-sector is playing the most important role in poverty alleviation and provides food security for rapid increasing population and employment for coastal communities and also to ensure their lively hood with environment suitability at a greater level. Forests are recognized as a key component of our environmental sustainability. The share of the forestry sub-sector in agriculture varies from time to time and mostly remained up to 01 to 2% with the main components of forestry, timber and firewood.

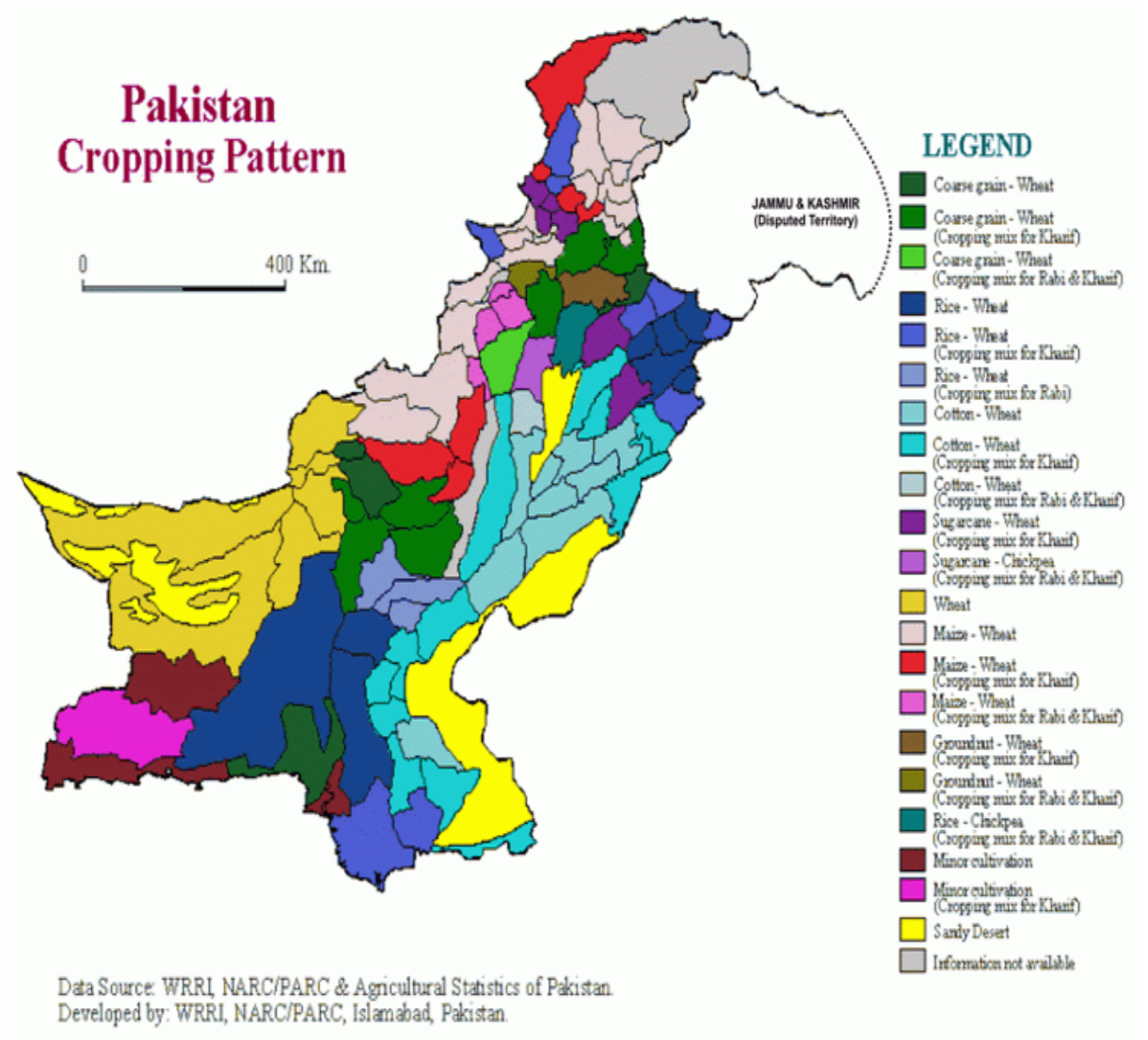

Figure -01

Green Revolution Policy and Changing Agricultural Practices (1951-1971)

In the ancestral period agriculture sector was neither documented nor planned in good manners but the British period earns up its place in history in agricultural development mainly due to the construction of Barrages in twenty century and several other marketing and infrastructural development schemes in the region. After the creation of Pakistan on 14th August 1947, no breakthrough has been observed in the first decade of the newly established

country due to political instability in the country. But the land reforms of 1958 and the green revolution period of the 1960s brought structural change; this paradigm shift on the one hand brought about significant changes through modern inputs and on the other led to a constraint in the agricultural economy of the country.

Despite several constraints, the agriculture of Indus valley still forms the backbone of the economy, contributing one-fourth to gross domestic product (GDP) and engaging the majority of the rural population in the valley. This is a farmer's perspective that Pakistan's agriculture sector growth performance has suffered due to a lack of strategic planning of the sector for its sustainable growth and development and its responsibility can be fixed on political economy elites making and implementing public policies from time to time in the greater public interest. The share of the country's cultivated crops and irrigated areas has fallen. Millions of acres of land are cultivable waste only due to water scarcity. It is also an important fact that the agricultural sector is mostly ignored by policymakers in developing and fragile economies like Pakistan in short/long-term planning particularly; after initiatives of the green revolution. Above mentioned ignorantly has affected agricultural growth and also spread rural poverty, particularly in the last three decades.

The growth practice and performance of the agriculture sector in the past were also attractive when Pakistan came into being a share of agriculture was more than 50% ofthecountry's gross domestic product (GDP) asa single large sector of the economy. The decade-wise average growth rate in agriculture has remained stable from 1950 to 1959, very impressive from 1960 to 1969 and was seen lowest in the year 1970 to 1971 details are mentioned in Table-01 below. It is very interesting at the initialstages that in 1951Gross Domestic Product-(GDP) and Agriculture growth were not impressive due to partitions of India and the migration process of the refugees but in 1952 it was stable with the support of the manufacturing sector growth which was 9.97. In 1953-54 overall growth jumped an impressive agriculture growth recoded as 15.23 with gross domestic product (GDP) growth 10.22. The next year it decreased again negative growth of -2.21 affected allied sectors and gross domestic product (GDP). The negative growth of agriculture was observed again in 1960-61 and 1970-71. The main reasons were political instability, separation of the eastern part of the country, war with India and internal hue and cry so the political economy could not play its role in the development of agriculture in the country as sustainable solutions to the challenges prevailed in the feudal dominated agriculture structure of the country. It can be seen the decreasing trends in agriculture growth jolted all other sectors of the economy at large in table 01 in details

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Table .1Economic Growth Indictors of Pakistan: Phase- I (First 20 Years) United Pakistan Period 1951-1970-71

(Constant factor cost FC) 1980-81=100					
Year	GDP	Agriculture	Manufacturing	Commodity Producing Sector	Services Sector
1951-52	-1.80	-9.06	7.77	-5.78	4.82
1952-53	1.72	0.81	9.97	1.82	1.58
1953-54	10.22	15.23	13.04	14.60	3.63
1954-55	2.03	-2.21	12.39	0.27	4.97
1955-56	3.53	2.09	10.07	3.92	2.90
1956-57	2.98	2.27	5.44	3.12	2.75
1957-58	2.54	1.92	3.73	2.79	2.12
1958-59	5.47	4.00	4.18	4.66	6.79
1959-60	0.88	0.29	2.14	0.65	1.23
1960-61	4.89	-0.21	12.88	4.38	5.70
1961-62	6.01	6.19	13.30	7.13	4.26
1962-63	7.19	5.21	11.20	7.39	6.88
1963-64	6.48	2.51	11.36	6.27	6.83
1964-65	9.38	5.25	9.95	7.23	12.84
1965-66	7.56	0.45	8.59	3.05	14.45
1966-67	3.08	5.48	5.66	4.79	0.74
1967-68	6.79	11.73	6.37	9.38	3.09
1968-69	6.49	4.52	8.63	7.06	5.62
1969-70	9.79	9.55	11.33	11.59	7.02
1970-71	1.23	-3.07	6.44	0.41	2.55

(Affairs, 1951-1957)

Land Reforms Policy and Agricultural Growth Practices & Performance (1972 to 2000)
This analysis is based on almost 30 years of agricultural practices &growth sustainability in the context of policies and programs implemented during the second phase of the green revolution with problems and progress in the sector because the period is outcome period of growth due to full implementations of green revolution policies in the country. The main cause of continued instability in the growth was the separation of the west part of Pakistan in 1971 and two wars with neighbours country India and heavy floods of 1975-76 and political instability in 1977 also harms the growth and development of the sector at large despite several reforms announced by the first democratic government of Pakistan including two land reforms but not properly implemented. The growth practice and performance of the sector in these almost three decades was mostly stable but negatively observed also four times in 1971-72,1974-75,1983-84 and 1992-93 as shown in table 02 below.

The Green Revolution initiative was started in Pakistan's agriculture in 1960 but the outcome period of these initiatives are decades between 1970 and 1980. The growth was stable from 1980 to 1990 due to food demand in the cold war zone of Afghanistan and the migration of refugees towards Pakistan stable policies of martial law government and USAID support for the agriculture sector particularly investment and reform in the irrigation sector. The decades of 1990 to 2000 again created large-scale instability because of the following reasons sudden

changes in regimes created political instability which led to a lack of proper policy for agricultural development and heavy floods of 1992, inadequate supply and crisis of input costs and issues in marketing of produce, particularly in cotton and sugarcane crop owners, paid a heavy price. It is very important to conclude with due diligence that in the decade 1990 a new political group entered in political economy which is called industrial class and country politics divided into two major groups one industrial group of the Muslim League –Nawaz and the second Pakistan People's Party group in leadership of Benazir Bhutto as Bhutto legacy the second group was pro-agriculture and first is pro industrial. Still, the political economy elites of Pakistan are divided into two groups but agriculture sector policies are not the preference of these groups. Most leaders of the above two groups are owners of cotton and sugar mills and small growers are left in the lurch at their mercy. Agriculture policy is mostly called price policy so both groups are avoiding investing in sustainable policy to provide food security to their country fellows and even not obey and implement the policy guides lines of the state to implement the normal price of their crop/output, these situations lead agriculture more instability and incompetency to deliver in global competitions. Another strong group of the political economy elite is civil and military bureaucracy but they are interested and investing their skills and money into the new group of real estate it is an emerging sub-sector of the economy since the new millennium era of 2000 which strengthen the services sector of the economy. It's easy to understand that growth practices have very serious declining trends and also been observed that the agriculture of Pakistan is in grip of a crisis for the last three decades and not performing well particularly since 1990 several times, the negative agricultural growth rate was observed. This setback disturbed economic growth and reduces export opportunities and income of the farmers at large.

The above-mentioned instability in agricultural sector growth affects the overall Gross Domestic Product-(GDP) and development process in the sector and also destabilizes the economic development of the region.Thetable 02 showenbelowis self-explanatory of the situation as analyzedfrom different perspectives.

TABLE – 02Economic Growth Indictors of Pakistan: Phase-II (30 Years)
(From Democratic Transaction to New Millennium Period 1971-72 -1999-2000)

	(Constant FC)					(Current MP)			
Year	GDP	Agriculture	Manufacturing	Commodity sector	Services Sector	Total Investment	Fixed Investment	Public Investment	Private Investment
1971-72	2.32	3.47	1.25	1.54	3.55	-2.90	-3.29	-60.63	0.42
1972-73	6.80	1.67	8.73	4.95	9.64	12.82	12.23	-0.64	5.08
1973-74	7.45	4.18	6.35	5.87	9.79	34.33	38.82	75.16	3.06
1974-75	3.88	-2.12	0.53	-0.46	10.04	56.86	-88.52	76.70	35.63
1975-76	3.25	4.47	1.39	4.65	21.45	49.63	40.40	57.45	24.50
1976-77	2.84	2.53	1.81	2.70	3.03	20.43	16.03	11.07	19.99
1977-78	7.73	2.82	10.21	5.63	10.51	9.26	9.61	15.46	11.94

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1978-79	5.53	3.10	8.01	5.07	6.11	11.33	9.13	7.93	11.94
1979-80	7.33	6.61	10.26	8.46	5.91	24.05	24.81	20.88	32.90
1980-81	6.40	3.66	10.63	6.26	6.58	9.83	4.77	-1.22	13.06
1981-82	7.56	4.72	13.75	15.09	7.90	19.62	14.43	19.77	7.97
1982-83	6.79	4.40	7.03	4.64	2.24	9.63	13.14	11.98	14.69
1983-84	3.97	-4.82	7.89	0.38	7.61	12.04	12.07	7.97	17.42
1984-85	8.71	10.92	8.09	9.45	8.21	12.81	12.59	11.35	14.07
1985-86	6.36	5.95	7.55	6.93	5.77	11.58	12.35	13.07	11.49
1986-87	5.81	3.25	7.53	5.76	5.86	13.46	14.27	17.03	10.99
1987-88	6.44	2.73	9.98	6.12	6.77	11.07	11.22	1.49	16.73
1988-89	4.81	6.87	3.96	5.77	3.81	19.65	19.69	15.99	23.94
1989-90	4.59	3.03	5.72	4.69	4.48	11.34	11.19	3.63	19.33
1990-91	5.42	4.96	5.39	5.61	5.21	18.96	19.53	16.29	18.31
1991-92	7.57	9.50	7.22	8.34	6.76	26.46	27.19	28.25	30.98
1992-93	2.10	-5.29	4.44	-0.27	4.63	13.79	13.86	15.59	13.33
1993-94	4.37	5.23	4.55	4.53	4.20	9.95	9.41	8.51	11.51
1994-95	5.06	6.57	2.54	5.32	4.80	13.41	13.30	21.23	8.48
1995-96	6.60	11.72	3.73	8.16	4.99	16.39	15.91	16.49	18.66
1996-97	1.70	0.12	-0.07	-0.10	3.61	8.04	7.72	0.64	19.52
1997-98	3.49	4.52	6.93	5.30	1.64	8.99	1.51	-14.85	13.28
1998-99	4.18	1.95	4.10	3.42	4.99	-3.56	1.51	25.77	-11.44
1999-2000	3.91	6.09	1.53	3.02	4.79	10.19	10.49	5.50	14.31

(Pakistan, 1972-2000)

Agricultural Growth Sustainability in 21st Century (2001-2020) & Pakistan Economy

Sustainable agriculture has very interesting definitions "A sustainable agriculture is one that, over the long term, enhances environmental quality and the resource base on which agriculture depends; provides for basic human food and fibre needs; is economically viable, and enhances the quality of life for farmers and society as a whole".(American Society of Agronomy, 1989, pp15). The modern practices in the agricultural sector are indispensable to the country's

sustainable economic growth, food security, employment generation and poverty alleviation particularly, at the rural level. The agricultural growth rate has been constrained by shrinking arable land, climate change, water shortages, and large-scale population and labour shifts from rural to urban areas. Increasing agricultural productivity, therefore, requires the adoption of new approaches. The better performance of agriculture is attributed to better weather and improved production system.

This is an Indus valley farmer's perspective in the digital era of the 21st century that the people related to the agricultural sector are suffering from multi-dimensional problems; small growers are worried about inadequate supply of input. They complain that feudal lords/elite groups get the lion's share of the input. Faced with such a dilemma, small growers fall prey to revenue and irrigation department officials even though they are not able to pay agricultural taxes imposed on them by the government. They have several complaints about the degradation of their land; millions of acres of land were completely affected by water logging and salinity. Every year country loses thousands of acres of fertile land due to population pressure; per capita land is also decreasing sharply and has created a fragmentation problem. Uncertainty in the supply of water and improper utilization of available water resources need serious attention. The shortage of quality seeds, pesticides and chemical fertilizer is a common problem. Many times, the cotton crop of the country was greatly affected due to the unavailability of good quality pesticides, inflicting a loss of billions on the economy.

The growers have complainedagainst public sector credit institution officials that they get bribes for loan sanctions. Rampant corruption was observed in agriculture, irrigation and other associated departments. The government research institute faces a shortage of trained workers and funds for research work. Every year, growers bear greater finical loss due to a flawed marketing system, mismanagement of public sector organizations and conspiracy/hegemony of commission agents and industrialists. These setbacks in the primary sector of the Pakistan economy which is called agriculture impacted a decrease in output and income of the people and economy, because the low level of investment and negligence of policymakers spread rural poverty at large, increased food inflation to double-digit and food insecurity among urban poor's, unemployment and other socio-economic problems, particularly in the rural economy of the country. Asa result of the above-mentioned problems, the average growth of agriculture during the era ofmilllinum development goals (MDGs) initiatives of UNDP (2000-2015) is 2.2 % over15 years. The agricultural growth was observed as negative as 0.27% in the year 2015-16. It's mainly due to a 28% drop in the cotton crop which set back 0.4% in GDP growth in the long run and the target of Gross Domestic Product-GDP growth is not achieved as planned by economic managers of the country. The instability of growth leads to food insecurity in the region. The table 03elaborates on the 20 years of agricultural growth practices and performance in close inspections.

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TABLE-03

Economic growth of pakistan (2001-2020)

		(Constant basic prices)			Current MP)		
Year	GDP	Agriculture	Manufacturing	Commodity Producing Sector	Services Sector	Gross Capital Formation	Gross Fixed Capital Formation
2000-01	3.65	-0.72	10.49	2.00	5.09	7.94	7.83
2001-02	2.37	0.76	4.07	1.01	3.51	-1.52	-2.32
2002-03	5.64	4.41	7.29	5.53	5.74	12.99	13.40
2003-04	7.70	2.85	16.38	9.23	6.45	13.80	13.62
2004-05	7.52	7.02	16.03	6.78	8.14	23.87	24.84
2005-06	5.56	1.27	9.39	2.38	8.20	25.77	26.81
2006-07	5.54	3.42	9.03	5.48	5.58	9.29	9.00
2007-08	4.99	1.81	6.10	5.05	4.94	17.70	17.94
2008-09	0.36	3.50	-4.18	-0.88	1.33	13.38	12.41
2009-10	2.58	0.23	1.37	1.76	3.21	1.43	0.31
2010-11	3.62	1.96	2.50	3.21	3.94	9.84	8.36
2011-12	3.84	3.62	2.08	3.09	4.40	17.11	18.05
2012-13	3.68	2.68	4.85	1.73	5.13	10.79	10.69
2013-14	4.05	2.50	5.65	3.49	4.46	10.01	9.72
2014-15	4.06	2.13	3.88	3.63	4.36	17.02	18.00
2015-16	4.51	0.27	3.66	3.03	5.55	5.02	4.90
2016-17	5.28	3.46	5.27	4.26	5.98	11.05	11.23
2017-18	5.5	4.0	5.4	4.3	6.3	25.4	13.7
2018-19	1.9	0.6	-0.7	-0.9	3.8	-21.6	7.1
2019-20	-0.4	2.7	-5.6	-0.1	-0.6	13.2	6.5

(Division, 2000-2020)

Agricultural Growth Instability and Gross Domestic Product (GDP)Nexuses

Agricultural growth insatiability debuted worldwide in the literature on economic growth and development It is defined as "The fluctuations in agricultural production disturb the rhythm and mutual balances among many interdependent processes in the economy"(Mahir, 2004).

Indus valley agriculture was the part and parcel of sub-continent agriculture before the partition and there are several systemic similarities in the same countries now named Pakistan and India after 1947. The available literature is also the same to address the challenges and to re-address the sector or frtherimprovmnets/reforms at large. "There has been stong linkage between growth and instability in agricultural output and it has widely argued that instability is a consequence of growth.There is a positive as well as a negative relationship between them" this is concluded by the renewed Indian scholar (Paltasingh, 2013).

The prominent researchers in the field of agricultural growth conclude that "Agriculture growth and instability have remained subject of intense debate in the agricultural economics literature in India. While the need for increasing agricultural production or growth is obvious, the increase in instability in agricultural production is considered adverse for several reasons.

It raises the risk involved in farm production and affects farmers' income and decisions to adopt high-paying technologies and make investments in farming. Instability in production affects price stability and the consumers, and it increases the vulnerability of low-income households to market. Instability in agricultural and food production is also important for food management and macroeconomic stability" (Rupa Chand, 2009).

The latest available literature on the subject matter concludes that in the Andhra Pradesh State majority of the population (62%) for their livelihood depends on agriculture-related activities; it contributesonly 27.84% to the state's Gross Domestic Product and is growing at 6.2% in 2018-2019, but found thegrowth and instability in Area, Production and Productivity of paddy with time series data of paddy.It is famous as the rice bowl of the country but a specific studyreveals that the area, production and yield of paddy are in decreasing trend in Andhra Pradesh year by year. The instability analysis clearly shows that there is high instability in the area, production and yield of paddy.(NRV. Ramana Reddy, 8 | August 2020).

A prominent scholar of the subcontinent A.Vaidyanathan1992), reviewed the instability in agriculture Extent, causes and consequences in detail and he concludes on basis of the review that "instability is an inherent characteristic of agriculture everywhere. Being dependent on weather conditions, area, yield and production of crops are liable to substantial variationsfrom year to year. The nature and extent of variability of agricultural production, its sourcesand implications have however not received systematic attention till recently, at any rate in the Indian context". The instability in agricultural growth over a longer period is one of the important decision parameters in development dynamics and more so in the context of agricultural production. Wide fluctuation in crop output not only affects the price but also wide variations in disposable income of the farmers that spread poverty among them, particularly in the rural economy at large. The above-mentioned problems are a greater challenge than harms overall production, reduces export, impacts other sectors of the economy and also affects inversely local and global food security at large. Pakistan's agricultural sector indeed has enormous potential but tapping this potential, however, will require higher levels of investment and some major reforms to public policy. This includes policies designed to address long-standing issues relating to land ownership, irrigation infrastructure, fertilizer markets, and the science required to provide farmers with improved cultivars and other technologies.

The improvement in environmental conditions also supports agriculture at various stages; culture is also interrelated with the growth process and needs to discuss widely with farming communities and the private sector in the greater interest of the public for more export and technological skills rather than dull old traditional cultivations.This dream will come true when growth sustainability will be focused on short and long-run policies by the political economy elites as the need of the hour and in a contest of historical growth and gross domestic product(GDP) trends in the Pakistan economy which shown mostly instability of the growth and highly impacted by the gross domestic product(GDP) and its allied sectors in Table 4&05 and also visible from figure-02 given below.

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Table-04 Instability in Agricultural Growth and Gross Domestic Product (GDP)

S.No	Period From	Period To	Decade-wise Agric Growth	GDP Growth
1.	1960	1969	5.1	6.8
2.	1970	1979	2.4	4.8
3.	1980	1989	5.4	6.5
4.	1990	1999	4.4	4.6
5.	2000	2009	3.2	4.7
6.*	2010	2020	2.8	2.5

Table-05 Instability in Agricultural Practices in Last 20 Years of 21st Century caused Food Insecurity

S.NO	Year	Agricultural Growth
1.	2000-2001	-0.72
2.	2001-2002	0.76
3.	2009-2010	0.23
4.	2015-2016	0.27
5.	2018-2019	0.6

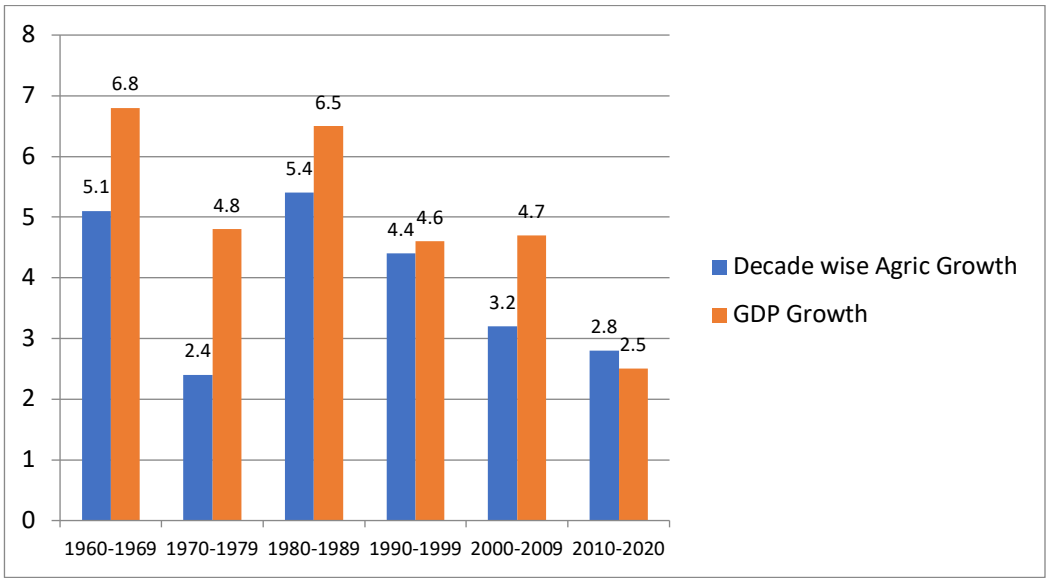

Figure-02Instability in Agricultural Growth and Gross Domestic Product (GDP) Growth Nexuses (Economic Survey Pakistan, 1951-2000)

Sustainable Development Goalsand Post-Pandemic Challenge of Food Security

The United Nations Organizations (UNO) introduced a set of 17 Sustainable Development Goals (SDGs) to end poverty, fight inequality and injustice, and tackle climate change by 2030. Pakistan has also followed these goals as a Member of the organization because it addresses not only the problems of today's world but also equally focuses on the future needs of the people. It is to highlight that more than 06 goals of the agenda, i.e. hunger, poverty, malnutrition, unemployment, sustainable growth, and natural resource conservation are directly associated with the agriculture sector. The Challenge of sustainable agricultural growth and its correlations with food security in the context of ever-increasing populations of the country and

the 04th green revolution in the agriculture sector with its nexus to farmer's education and literacy in the Indus valley region are discussed in the analysis below in details.

Food security is defined by the Food& Agriculture Organization(FAO) as "Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life."(Walter Fraanje, n.d.). In the 21st-century food security situations are at stake due to growing conflicts at regional, national and global levels, unemployment, rapid increasing populations in the third world, changing consumption patterns globally, extreme weather events due to global warming/ climate change, and the economic and health issues largely posed by the Covid-19 pandemic are the major causes to speeding uncertainties and contributing to hunger in the world.

When we analyse the current food security country status we find that we are at larger risk as mentioned by a recent reliable report "Pakistan ranked 92nd out of 116 nations in the Global Hunger Index (GHI) this year. With a score of 24.7, the country's level of hunger is categorized as 'serious'. The report further, mentions: "As the year 2030 draws closer, achievement of the world's commitment to Zero Hunger is tragically distant". Further, it contends that current projections show that the world as a whole- and 47 countries in particular-will fail in achieving even low hunger by 2030. (Concern Worldwide and Welthungerhilfe-2021).In addition, the global report on food crises-2021 predicts that food crises will become more widespread and severe, with a bleak outlook for 2021. According to the World Food Programme, 41 million people are on the verge of famine.((FSIN), 2021)

It is also concluded that over the last three years, Pakistan's double-digit food price inflation, along with dwindling income, has left more Pakistanis food insecure. The World Food Programme (WFP) estimates that approximately 43pc of Pakistanis are food insecure and 18pc of those have acute food insecurity. The The World Food Programme contends that affordability is the "greatest barrier to achieving a nutritious diet," estimating that the majority of Pakistanis are incapable of affording nutritionally acceptable food.(World Food Program, 2021)

The Food Insecurity model was developed by Food & Agriculture Organization (FAO) recently with 08 key questions to estimate the food insecurity situations during covid-19. It evaluates in detail how many households have adequate access to food both in quality & quantity and how many households either faced uncertainties about their ability to obtain food or have been forced to compromise on quality and/or quantity (Moderate level). Further, it also provides information that how many households typically ran out of food and at worst gone a day without eating (severe level of food insecurity) in the last 12 months. It is found that 84 per cent of households are food secure and 16.44 per cent of households faced moderate &1.80% faced severe food insecurity in Pakistan which is alarming data is reflected in Table 06 in detail.

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Table-06 Food Insecurity Situations in Pakistan and the province

Moderate or Severe Food Insecurity		
Region	**Severe**	**Moderate Severe**
Pakistan	1.80	16.44
Punjab	2.29	15.66
Sindh	1.52	17.52
Khyber Pakhtunkhwa	1.24	14.44
Baluchistan	3.55	23.36

(Pakistan Social & Living Standards Measurment, 2019-2020)

The (PSLM 2019-20) concludes that Baluchistan and Sindh are two of Pakistan's provinces having the highest prevalence of food insecurity, malnutrition and poverty. In 2020, the population faced multiple shocks including high food prices, locust outbreaks, rains/flooding/snowfall/drought, all exacerbated by the impacts of the COVID-19 pandemic. The study selects ten rural districts of Baluchistan and nine rural districts of Sindh for in-depth analysis. In total, around 3.8 million people (26% of the population analyzed) are estimated to be facing high levels of acute food insecurity in the current year period of March to June 2021, corresponding to the end of the lean season and the beginning of the harvest season. Food insecurity remains high in Pakistan, particularly in rural areas and policy maker's need urgent action that is required to protect livelihoods and reduce food consumption gaps of people in Crisis and save lives and livelihoods of people in Emergencies. The COVID-19 pandemic is spreading fast in Pakistan like in many other countries across the globe. It came at a time when the country is already going through the highest food inflation and slow economic and agricultural growth. A quarter of the population (around 53 million people) lives below the national poverty line and around two-fifths (around 84 million people) are multi-dimensionally poor Similarly, food insecurity is also very high and between 20-30% population (40 to 62 million people) is in some form of food insecurity in Pakistan. Given the scale of this emergency, while the situation is still evolving, there is a strong likelihood that the number of food-insecure people will rise especially in areas already affected by the high recurrence of food insecurity and hit hard by COVID-19.

The prevalence of acute malnutrition among children under five in all provinces/regions excluding Islamabad capital tertiary (ICT) and northern regions of Gilgit and Baltistan which is famous as tourist industry (GB) exceeds the emergency threshold (15%). This is concluded that Sindh and Baluchistan's southern regions of the country are most affected by poverty and food insecurity in comparison to the northern regions of Punjab and Khyber PakhtoonKhwa (KPK). This is food for thought for researchers and academics and intellectual's to conduct a robust study on the subject matter to evaluate the root causes of the southern and northern divide in the country'ssocio-economic situations because the southern region is rich with natural resources but their people are suffering from multi-dimensional problem including acute poverty and food insecurity at large.

(Kalam, 29 november, 2021)concluded the critical situation of food insecurity in Pakistan and suggested feasible policy recommendations to cope with the challenge in the post-pandemic era to serve the nation with great enthusiasm in the future.He argued that our economic and financial policies have only exacerbated social and economic inequities while

simultaneously increasing the number of people who are food insecure. His emphasis to avoid future food crises, the government must strive to improve the value chain of fruit and vegetable crops while also ensuring the availability of storage facilities. “The government must promote crop diversification, water management, and climate-smart farming to decrease the devastating effects of natural disasters on food security. Prioritizing agricultural value addition and preserving subsidies for essential crops is also critical for the country’s food security”.

CONCLUSION

Sustainable growth can play a significant role in local and global food security if policymakers focus it on long-run investment policies and planning. The main cause of instability in the growth in Pakistan during the first phase of the green Revolutionfrom 1951 to 1971 was two wars with India and the separation of the western part of Pakistan which is called Bangladesh nowadays. After the revival of a few years of the first elected democratic government supper floods of 1974-75 and political instability in 1977, also harms the growth and development of the sector at large. It is concluded that land reforms are partially implemented in Pakistan because the majority of feudal are part and parcel of establishments. The growth in the second phase of three decades from 1972 to 2000 was negatively observed four times period political instability of 1972, due to heavy floods of 1974-76 in the country and 1983-84 due to great movement for restoration of democracy against military rule and heavy rains of 1992-93. The poor growth sustainability and paradigms shift in investment from agriculture to other sectors are analyzed from 2001 to 2020 in the third and last phase of agricultural growth in Indus valley. The study also concludes that investment in agriculture is more beneficial and safe in the compression of other sectors of the economy because of more profits and low risk in investment. But unfortunately in the last two decades from 2001 to 2020, less investment came towards this sector.

It’s observed that the unstable sometimes –minus growth in various decades impacts adversely on the overall growth of gross domestic product (GDP) and other relevant sectors of the economy and inversely impacted the development process and capital formation, in the long run, this statement is endorsed by the World Bank and feed the world a global form of Food and Agricultural organization’s (FAO) at large in their respected studies. The livestock fisheries forestry and poultry supporting sub-sector have a significant role in sustainable agricultural growth strategy if managed properly and decently in the context of their increasing share in the economy, export demand abroad and more profitability in comparison to major and minor crops as evident. These sub-sectors have been given less attention in the past strategy of growth and development but have potential. The results suggest that the Government of Pakistan with the support of international donors /stakeholders should make some intervention in the agricultural sub-sectors by introducing innovative agriculture technologies that could improve the subsector's share in the overall agriculturegross domestic product(GDP) as a game-changer. The analysis of the longer period data indicates that major crops, minor crops and livestock substantially share the agriculturegross domestic product(GDP) with a coefficient. However, the forestry sub-sector was not significant economically but it has still important in the agriculture sector because of the global warming / environmental aspect of the growth strategy and climate change prospects. The strategy of export-led growth and import reduction bill by promoting and production of import substitutes is also significant. The agro-based industry at the farm level helps in raising the agricultural production and at least support the 06 goals of SDGs to implement indecent manners.

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The study concludes that Pakistan's agriculture sector growth performance has suffered due to the poor role of the political economy and a lack of strategic planning of the sector for its sustainable growth and development in global competitiveness. In support of the above-mentioned statement the share of the country's cultivated crops and irrigated areas has fallen sharply. Millions of acres of land are cultivable waste only due to water scarcity. The farm sector in the region faces expanding demand for food, feed and bio-fuels, the rising price of energy, increasing water scarcity as well as the upraising effects of climate change destabilising agriculture growth particularly impacted the unstable gross domestic product (GDP) growth of the country. The farmer's community has several complaints about the degradation of their land; every year country loses thousands of acres of fertile land due to population pressure, per capita land is also decreasing sharply and has created a land fragmentation problem. Uncertainty in the supply of water and improper utilization of available water resources needs serious attention from policymakers. The shortage of quality seeds, pesticides and chemical fertilizer is a common problem. Growers do not get off the best quality seed. Every year, crop production is affected due to insects and pest attacks which leads to growing instability in the region at large. This study suggests afurther study to develop a feasible strategic policy document for sectoral reforms and to address the above-refereed issues/factors impacting growth sustainability and creating food insecurity in the Indus valley in a separate policy document to help the government in the greater public interest.

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