

## A comparative analysis of agricultural development and modernization between China and Pakistan

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### ABSTRACT

The economies of developing countries like Pakistan and the Republic of China are highly influenced by agricultural growth and development. It has been frequently discussed that economies can develop through agriculture production growth and agriculture modernization. The role of the agriculture sector in the development of economies has comprehensively discussed whereas the association among the agriculture sector and other sectors of the economy that can alleviate poverty. The study discovers that innovation in the agricultural sector would not only prompt poverty diminishment but also boost up the economic growth in poor countries. It defines clearly all those differences which are found in the introduction of new technology adopters and non-adopters of between Pakistan and China. The prosperity suggestion of this study monitors as: it was settled in the introduction section that agricultural growth over the fulfillment of modernization is one of the key policy purposes of Pakistan and China's economies. Nevertheless, in the detection of economic growth, development among various objectives (e.g., service sector growth and industrialization) can tricky in light of the fact that it just targets higher economic development, although ignoring the agricultural sector, does not essentially involve prosperity for all of the population, especially poor people, and eventually rises dissimilarity. Here it is important to refer looking at the effects of costs, assets, technology, education, unrestricted investments, climatic factors on long-term food accessibility in Bangladesh, found that climatic elements to have generally more impact on food availability than technologies. The major objective of this study is to demonstrate the possible solution for economic growth and highlight previous work is done on agriculture development and modernization in Pakistan and China.

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### 1. Introduction

Agricultural sector has dominant role in the economy of any country to boost its economy, and also a key driver of agriculture-related industries. It has contribution to increase GDP about 29 %, and about 65% of the world population is associated with agriculture in the agricultural-based countries (Rehman et al., 2015a; 2017a). Fig. 1 illustrates the contribution of agriculture sector in the economy. The livelihood of 86 percent peoples in rural area depends on agriculture sector. In the developed and

transforming countries, service and manufacturing sector has necessary role to interconnect with agriculture and have esteem chains about 30% of GDP>It is base for the sustainable rural communities and provides jobs to 1.3 billion dispossessed workforces when there is urban instability. In developing countries, about 3 billion peoples out of 5.5 billion lives in the rural areas about portion of humankind. About 2.5 billion rural populations livelihoods depend on agriculture sector what's more 1.5 billion are in the smallholder family unit. Agriculture has important role to boost economic growth and reduce the poverty in the agro-based countries. In the developing countries, agriculture performs a noteworthy role for the social and economic growth. It recovers the position of assess of the rural poor farmers and helps the farming sector more modest and supportable and increases the income sources at the work advertise and the provincial nonfarm economy, and encouraging

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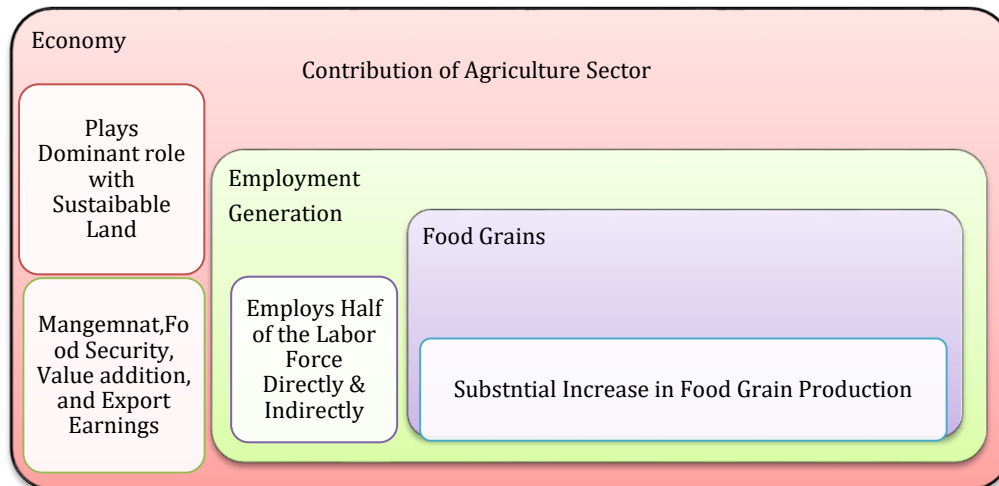
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effective movement out of agriculture. For the progress of all zones of agriculture information

suitable excellence is basic point.



**Fig. 1:** Contribution of agriculture sector

In agriculture-based countries, the agriculture sector can be an engine of development, its average contribution in overall economic growth is 32% and offers income and jobs most of the poor people who live in rural area. The average contribution of agricultural sector in economic growth is about 7% in the transforming countries. It is a compelling instrument to reduce poverty but urban poverty is less than the rural poverty (World Bank, 2008). Agriculture plays an important role in adjusting the other sector of an economy in the transforming countries. Growth in the agriculture sector is a significant base in the early stage to boost. It plays an important role in structural change of an economy (Dercon, 2009). Information and Communication Technologies (ICTs), is used for the purpose to increase agricultural efficiency and sustainability and also support the farmers. ICTs can use for the production, stored, evaluated, dispersed of data and information. The information services are necessary in the agriculture at the domestic and provincial level.

A technological modification is compulsory ailment for the agricultural modernization and transformation rather than satisfactory circumstance. Enhancement of agricultural efficiency contains the change which is not only technological aspects but also in fundamental features or in the manufacturing unions when taking agriculture as a system. For economic development, agriculture has positive role in the poor countries to support their economy (Kuznets and Murphy, 1966; Rehman et al., 2015b). From 1987-1997, four methods was employed in China (the Chenery-Watanabe, the Rasmussen, the Pure Linkage, and the Dietzenbacher and van der Linden method) instead of one, to investigate more strong outcomes and create the inter-sectoral associations of key sectors, and found that inter-sectoral interdependence that positively connected with an increasing tendency (Andreosso-O'Callaghan and Yue, 2004). The annual income has

been boosted by increasing the agricultural production. Access to domestic markets regarding food supply significantly impacted the agricultural production that becomes cause of suitability by civilizing agricultural process. Fig. 2 shows the gross domestic product GDP growth in China and Pakistan from 1980-2004. It includes several segments namely agriculture sector, industry sector, service sector and total growth per capita income of both countries.

The structural change in the Chinese economy has been significantly causing the growth. Agriculture sector contribution to GDP during 1970 was 40% and fell down in 1980 to 30% and 20% in 1995, 11% in 2007. During this time the contribution of industrial sector in the national GDP was varied, and in 1980-1990 growth was increased steadily up to 41% and was 49% in 2007. The share of services sector to GDP was 13% and was 21% in 1980, 40% in 2007. In reaction to external trade patterns and fluctuations in national demand of China continue to encourage its structural modification policies and economic reform. In late 1990s 40% of labor force of rural areas was engaged to non-agricultural sector (Barrett et al., 2001).

Percentage share of agriculture in national economy from 1983 to 2012, e.g. share of agriculture in GDP, share of agriculture in employment, rural consumption in retail, agriculture in revenue, agriculture in government expenditure, agriculture in bank loans, agriculture in import, agriculture in export presented in Table 1.

## 2. Importance of agriculture sector in China and Pakistan

### 2.1. Importance of agriculture sector in China

China's agriculture economy is the biggest economy in the world, plying an important role in

producing and consuming agricultural products in the world agricultural markets. China's part in the global rural exchange has suggestions for farming makers, customers, and policymakers in the United States. Although the foundation of business sectors for rural information sources and yields has helped China to rise agriculture generation in the course of

recent 30 years, the nation faced a few issues that will be more difficult to determine. Over the past 30 years China's agricultural economy facing challenges and difficulties, policy makers need to play an important role in addressing the problems and make policies that how to affect the trade of agricultural products.

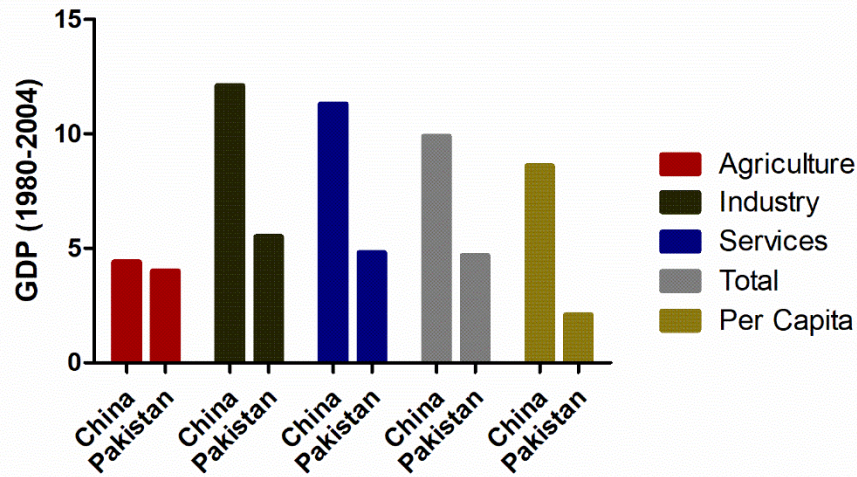


Fig. 2: Pakistan and China real growth in GDP and exports from 1980-2004

Table 1: Percentage share of agriculture in national economy from 1983 to 2012

1983-2012	% Share in GDP	% Share in Employment	% Share in Rural Consumption	% Share in Revenue	% Share in Government Expenditure	% Share in Bank Loans	% Share in Import	% Share in Export
1983	33.9	67.1	51.4	4.2	0.0	0.0	26.6	22.3
1984	33.1	64.2	52.5	3.7	0.0	0.0	18.5	22.6
1985	29.8	62.4	53.0	2.1	8.3	0.0	12.1	24.5
1986	28.5	41.5	52.1	2.1	7.9	0.0	12.0	24.5
1987	28.3	60.0	51.7	2.4	8.0	0.0	14.8	22.0
1988	27.2	59.5	50.8	3.1	7.9	0.0	16.8	22.0
1989	26.4	60.1	50.0	3.1	9.4	0.0	17.1	20.5
1991	26.2	60.0	47.0	2.9	10.3	6.7	13.7	15.8
1992	23.6	58.6	45.5	3.4	10.1	6.7	12.0	14.5
1993	21.5	56.0	44.6	2.9	9.5	6.5	8.1	13.7
1994	21.6	53.3	43.9	4.4	9.2	4.9	10.8	12.9
1995	20.8	52.2	43.2	4.5	8.4	3.1	9.30	9.4
1996	20.4	50.5	43.2	5.0	8.8	3.1	7.1	8.4
1997	18.3	49.9	43.4	4.6	8.3	4.4	7.0	8.2
1998	18.0	49.8	38.9	4.0	10.7	5.1	7.0	7.5
1999	17.6	50.1	38.7	3.7	8.2	5.1	5.0	6.9
2000	16.4	50.0	38.2	3.5	7.8	4.9	5.0	6.3
2001	15.8	50.0	37.4	2.9	7.7	5.1	4.9	6.0
2002	15.3	50.0	36.7	3.8	7.2	5.2	4.2	5.6
2003	14.6	49.1	35.0	4.0	7.1	5.3	4.6	4.9
2004	15.2	46.9	34.1	3.4	7.5	5.5	5.0	3.9
2005	12.5	44.7	32.8	3.0	7.2	5.9	4.3	3.6
2006	11.8	42.6	32.5	3.1	6.5	5.9	4.0	3.2
2007	10.8	40.8	32.3	3.2	6.8	5.9	4.3	3.0
2008	10.7	39.6	30.3	3.1	7.2	5.9	5.1	2.8
2009	10.3	38.1	32.8	4.1	8.7	5.8	5.2	3.3
2010	10.1	36.7	31.9	4.1	9.0	5.4	5.2	3.1
2011	10.0	34.8	31.8	3.8	9.1	5.4	5.4	3.2
2012	10.1	33.6	31.9	3.8	9.6	5.7	6.1	3.0
(%)								
Annual growth rate	-4.4	-1.9	-2.1	0.8	-0.5	0.3	-5.1	-8.3

China was poorest nation with more than 60% population or above more than 60% of the world, per day income was less than 1\$ in the early 1980s. China in 1990 in light of high development rates filled in terms of professional career receptiveness,

reduced poverty to less than 33% and 13.4% in 2003. Studies have more prominent importance in offering reference for China to locate its legitimate method for agrarian modernization. The most critical motivation Schultz has given us is to search

for a way to enhance rural effectiveness through factor examination (Schultz, 1987). Now days agricultural technologies become an important part nearby Chinese and foreign researchers instead of structural change. Agricultural modernizations to the technological field in research approach increase the productivity of agriculture sector. Since 1950s, the main development activity of China was growth of the agricultural production. Aside from the starvation years of the late 1950s and mid-1960s, the nation has appreciated rates of creative development that have outpaced the ascent in the populace. Despite the fact that yields and aggregate creation ascended amid the pre-change period, add up to factor efficiency did not, and provincial livelihoods were undeveloped (Rozelle and Huang,

2004). Farming is in charge of a significant part of the change in the livelihoods and wholesome status of poor people. The population of China was not higher than its annual growth from agricultural sector later 1978. But in many areas it faced the problem of diminishing marginal returns which means high inputs will not raises output. Numerous have anticipated that in future all additions should originate from new innovations that altogether enhance agriculture efficiency. China's agricultural and rural economies will further challenge in the form of exchange progression and strains between nature and advancement (Rozelle and Huang, 2003; Huang et al., 2004). The GDP per capita and nominal per capita GDP in USD are show in Fig. 3.

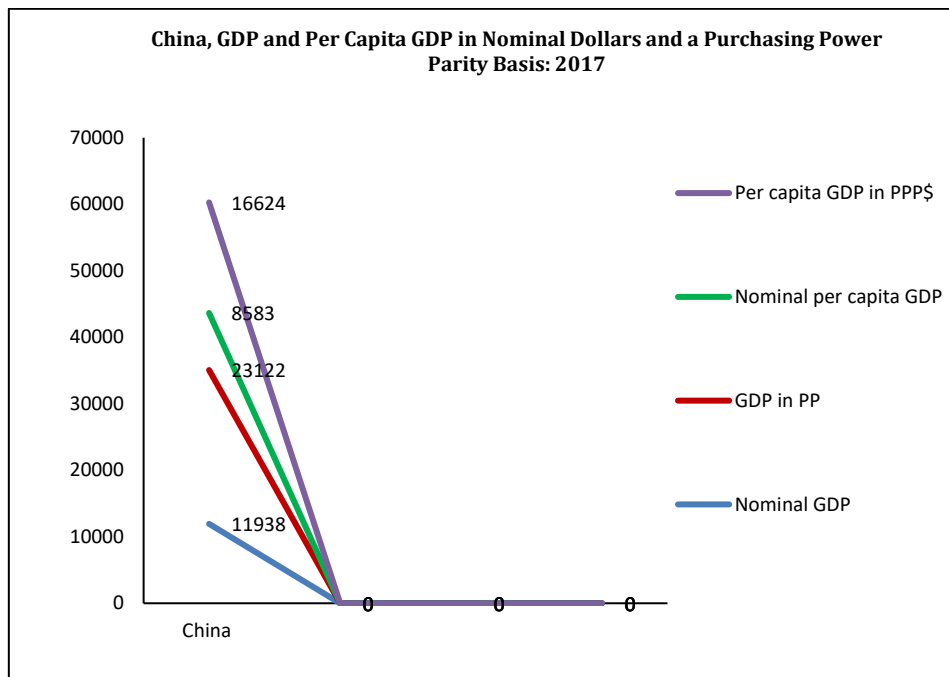


Fig. 3: Per capita GDP and Nominal per capita GDP of China

At the present, China is focused on land and water assets of oversee to attempt and to create current advertising foundations and framework to help rustic earnings to keep pace with urban wages and to create or adjust horticultural innovations. China has a long haul need to source satisfactory nourishment to fulfill rising residential request and higher rural efficiency is a noteworthy net exporter of sustenance on the planet, especially in arrive escalated items, for example, wheat, soybean, corn, and hamburger. Given its wealth of specialists, China has a relative preferred standpoint in labor-escalated prepared things, for example, certain amphibian item squeezed apple, and quills and down.

## 2.2. Importance of agriculture sector in Pakistan

Pakistan is an agrarian economy. The agricultural area is deliberated as the foundation of Pakistan's economy and driver of economic development. Pakistan is a sixth most populated nation in the

world, with a 162mn of population, which has been developing at the rate near about 2.5% yearly. The 2/3 of its population is living in country territories and horticulture is their real wellspring of income. Farming contributes 21% to GDP and representatives 45% aggregate workforce. Furthermore, it likewise contributes significantly to Pakistan's fare income. Henceforth, it tends to be surmised that any change in this segment will influence emphatically all macroeconomic markers of an economy, especially destitution. Agriculture is one of the leading economic segments of the nation, it contributes around 9.8% of the total national output (GDP) and 42.5% of the rustic individuals are related with agribusiness (GOP, 2015). Agriculture gave fundamental force to financial development by making extra request of products and ventures because of higher costs of rural create. Because of exorbitant spike in costs of significant harvests, an extra measure of Rs. 342 billion was exchanged to the rustic territories in 2010-11. In spite of this exclusive Rs.329 billion were exchanged to the



provincial regions by virtue of higher costs of significant products amid the eight years (2001-

2008). Fig. 4 illustrates the contribution of Pakistan's agriculture sector from 1965-2004.

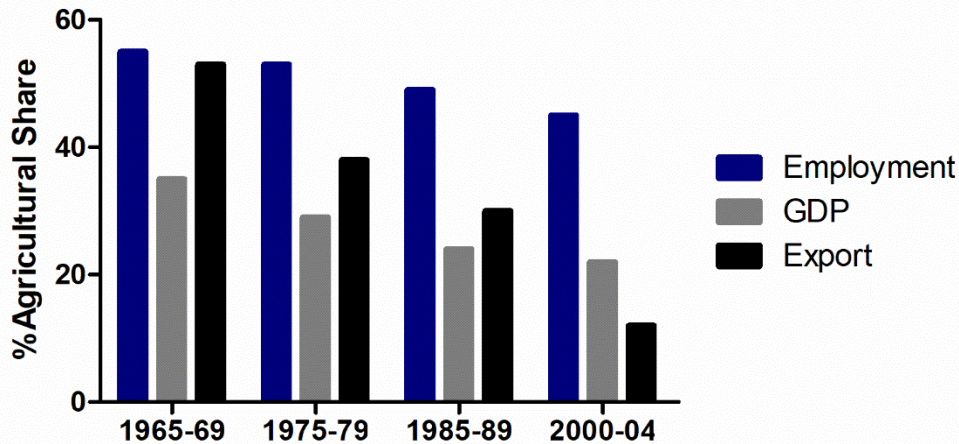


Fig. 4: Contribution of Pakistan agriculture sector from 1965-2004

More or less, contribution of Pakistan's agriculture sector in national GDP is 22% to 24%, utilizes 44% of the nation's aggregate work drive, straight forwardly maintains about 75% of the population, and backings 30% of fares. From that point forward, to expand the overall agriculture growth in Pakistan which need to improve the knowledge and technology transfer at the country's provincial level? The administration of the rural expansion has been sorted out under the nation's provincial ministry of agriculture. Different investigations have been established that the nation's agrarian augmentation instruction address the edit generation, trim administration, learning, and innovation exchange which intend to enhance the general horticulture in the Pakistan (Shah et al., 2010; Luqman et al., 2007). Pakistan's agricultural system faced many challenges, the primary obstacles which are being looked by agricultural expansion framework are; less utilization of ICTs, non-accessibility of assets, uncalled for transportation office, an absence of preparing and cooperation among various rural divisions. Such issues diminish the dispersal of rural data (Yaseen et al., 2015).

Modern agricultural technology have vital role to enhance agriculture, Pakistan still has the lack to use the modern agricultural technology to boost its agricultural production (Rehman et al., 2016). Human capital plays a significant role in sectoral growth (Hena et al., 2018). Agriculture sector of Pakistan plays an energetic role and provides raw material to agro-based Pakistan's agriculture sector produces surpluses for export to gain remote trade which is truly necessary that is most significant part of agriculture in the economy. It accounts 21.9% offers in the gross residential item (GOP, 2015), and provide employment almost about 70% people who live in the rural areas (GOP, 2003). Annual income has boosted by high agricultural production that positively affects access to sustenance supply in the local market which adds to agriculture

manageability by enhancing agriculture practice. Pakistan is an agricultural country in spite of the fact that its economy has seen extensive diversification throughout the years (FAO, 2017). Regardless of the more prominent part of agriculture in the economy and sustenance security, yet the nation has not possessed the capacity to understand its genuine agrarian generation potential as it is much lower than numerous different nations of the world (Noor et al., 2016). Furthermore, actual yield and conceivable potential yield of crops found enormous gap (Zafar et al., 2017). Agriculture production can significantly boost, if farmers adopt available technologies according to recommendations (Waqas et al., 2017). Accordingly, there is a desperate need to make utilization of science and innovation in the field of farming. In this specific situation, agriculturists require sufficient data and presentation to the most recent innovations. Research has demonstrated information's and exposure of farmers is a main effecting factor of their selection conduct. In the late 20<sup>th</sup> century, the agricultural extension system started in the developing countries with taking another path worldwide development for changing the national growth (Musingafi and Zebron, 2014). The growth of agriculture has perceived an appreciated rise as it as it bounced from 0.3% in 2015-2016 to 3.5% in 2016-2017 showed in Fig. 5.

The techniques executed to embrace rural expansion exercises are classified into individual, gathering, and mass augmentation strategies (FAO, 2002). In developing countries modern information and communication tools (ICT) assume an imperative part in enhancing the accessibility of market data and rural improvement (Casaburi et al., 2014). Wheat, maize, sugarcane, cotton and rice are the major crops of Pakistan (Rehman et al., 2017a). According to financial overview of Pakistan contribution of major crops in GDP around 5.4% and

contribution of major crops in agriculture part is going to be 25.6%.

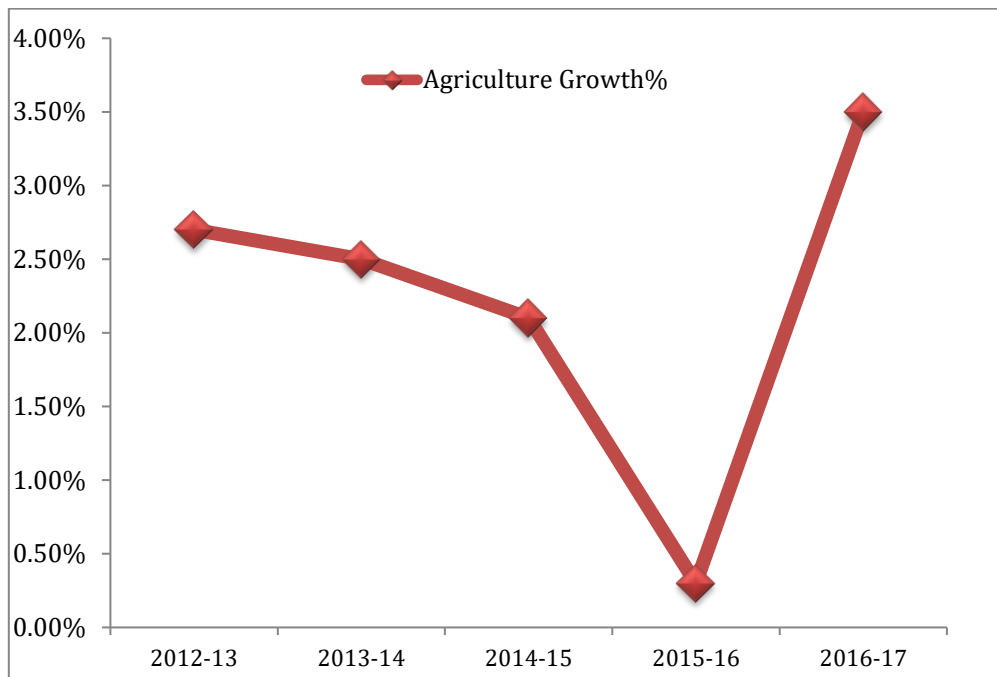


Fig. 5: Agriculture growth during the period of 2012-2017

Rice is money in addition to a sustenance trim. Pakistan real yields are wheat, rice, maize, sugarcane, and cotton (Rehman et al., 2017b). The commitment of significant products in the horticulture part is going to be 25.6% and commitment of real harvests in GDP is right around 5.4% as per the financial overview of Pakistan. The contribution of wheat crop is about roughly near 10.3% and in the GDP is about 2.2% (Rehman et al., 2017c) Pakistan delivers great rice which is ideal and like in everywhere throughout the world. Pakistan has the claim to fame in however because of some intrinsic issue we have not overabundance on mastery to making send out on a considerable measure of the amount of good rice that in the long run impacts on our remote trade hold. The offer of rice in the farming is right around 3.1% and in GDP is 0.7%. Cotton is an important cash crop of Pakistan having dominant role to contribute in the national economy of Pakistan (Rehman et al., 2016). The Cotton is a money harvest and makes crude material for our material industry and commitment in the gross domestic product which is contributed about 1.4%. Sugarcane is likewise a money edit and furthermore nourishment trims. Our sugar industry depends on the crude material of sugarcane. Sugarcane contribute in agribusiness part is 3.4% and in GDP is 0.7%. Our minor products include beats, Mustard, Gram, Jawar, Bajra, Oilseeds, and grain. Minor yields contributing in farming division is 11.6% (Usman, 2016).

### 3. Agricultural modernization

Traditional agricultural sector and a modern capitalist sector are portrayed the developing economies. In the modern sector productivity is

supposed to higher than traditional sector. The authoritative model was advanced by Lewis and Thusly (Lewis, 1954) reached out by Ranis and Fei (1961). Lewis' model lays on the possibility of surplus work in the agriculture division. Labor moves to modern sector from agriculture which succeeding economic growth because with bring down profitability in farming; wages will be higher in modern sector (Schultz, 1964). Different forerunner, agriculture is considered the basic source to food supply. Growth is impossible without agriculture growth; this sector had an important role in the economic growth and confirms subsistence in the society (Kuznets and Murphy, 1966). The significance of agricultural sector has been failure with economic growth, in economic development the role of agriculture sector is to supply cheap food and low wage to labor. Generally the two sectors have couple of interconnections. Development and higher profitability in the rural division can add to general economic development by discharging work and as well capital to different parts in the economy. Be that as it may, industrialization is viewed as a definitive main drive behind a nation's advancement and agriculture as a traditional low-efficiency division (Irz et al., 2001).

Science and technology has boosted the modernizations. Knowledge can separated among industrial and developing countries through the private investment in research and development (R&D). Advance development through science and innovation driven by swiftly developing the private interest in innovative work (R&D), the learning separate amongst modern and creating nations is augmenting. Counting both open and private sources, creating nations contribute just a nonagon of what mechanical nations put into agribusiness

R&D as an offer of GDP. According to the report of 2002, in developing countries 883 million people lives in the rural areas; three out of four people are poor. A more powerful and comprehensive agribusiness could significantly diminish the rural poverty because most of them depends on farming jobs, specifically or in a roundabout way. There are numerous examples of overcoming the adversity of agriculture as a motor of development ahead of schedule in the advancement procedure and of agriculture as a noteworthy power for poverty diminishment. In developing countries both traditional and modern sectors are connected each other in order to makes agriculture growth and poverty reductions. In order to response of high domestic demand need to boost agricultural output prompt jobs formation in the farming sector which led to increase employment and profitability that directly influence to reduce poverty. The poor consumer's purchasing power will increase due to low prices of food. The enormity of these impacts to reduce poverty relay upon the specific conditions of an economy. For instance, if innovative advancement in the rural area is work sparing, cultivate business may not really expand (Eswaran and Kotwal, 1993).

The role of both agriculture and modern sector becomes less important in the open economy in which the goods of both sectors can be traded. Subsequently, there is less need to increment

farming efficiency to instigate general development and poverty reduction. The productivity of agricultural sector is less than other sectors, food can import and absorbed on other sectors of economy that may be become more beneficial for development of a country. In specific circumstances, the agriculture sector can be essential for the economic development. In close economy with landlocked country overall growth can be driven by agricultural sector and ought to be bolstering efficiently (Xuan and Wang, 1998). The procedure of traditional agriculture changing into modern agriculture is known as agricultural modernization. In this practice, a lot of modern mechanical skills are used in the agriculture activities, which enhance farmer's income and increase their living standers which become the cause of rural urban gap, are the basic aim of modernization agriculture system. Modern science, technology, methods of production, using advanced scientific and research methods for organizing and dealing agricultural sector, enhancing social and mechanical characteristics of agriculture workers' and changing slouch traditionally agricultural system into modern agriculture system that ensures propel profitability and maintenance and change of the manageable improvement of ecological quality is shown in Fig. 6 (Zhao et al., 2007).



Fig. 6: Modern and traditional agriculture methods

The traditional agriculture creates the special economic balance which a good key point to agricultural transformation experts. New factors need to introduce basic aim with a specific end goal to break this state, which can help to improve the efficiency of agricultural production. Agricultural productivity will not improve an unmodified reallocation of resources in the traditional agricultural framework. As Schultz would see it, the way to agricultural modernization lies in presenting new estate innovation, enhanced types, more productive power sources and less expensive fertilizers (Schultz, 1987). As indicated by a few delegates for the far reaching hypothesis, for example, the process of changing traditional agriculture to modern agriculture and sum of arrangements and measures to encourage includes

in the agriculture modernization. The index system of agricultural modernization was moderately dissimilar in the various regions. The agriculture modernization index system contains modernization of agriculture for the urban and rural farmers. The main hypothesis of this index system is that the understanding of researcher's shows the connotation of agricultural modernization subjectively, objectively, economically, socially and naturally fairly changed (Zhao et al., 2007).

Business, social and public information and communication technologies can positively affect the development of an economy and society. In China it has been significant phenomenon in that information raises the transformation of an economy and society. In china, there has no authorized designation of Agricultural Informatization. The procedure of

converting agriculture sectors from side to side the actual use of ICTs in the agricultural production. A useful summary at the general and local levels in China concluded that informatization growth accomplishments and policy consequences was published by Li et al. (2014). Conversely, Liu (2012) discusses that present studies on China's agricultural informatization is quiet disjointed and examining (Li, 2005; Liu, 2012). The primary instrument of agricultural growth has been technological change, in 1984 extra existing research display that subsequently the HRS was finalized. Even throughout the initial transformation era considered that progresses in the knowledge contributed by far the largest share of crop production growth (Jin et al., 2010). Enhancements in innovation contributed by a wide margin the biggest offer of crop production development, notwithstanding amid the early change time frame. These investigations demonstrate that changes other than de-collectivization additionally possibly influence agriculture development. Value arrangement has been appeared to have impacted the development and decay of grain and money crops amid the post-change period. The hypothesis conventional administration of agricultural motorization is incorporated organization, source, generation, protection and remodel, orderly examination, methodological support, educating and the utilization of such work of farming gear, joined the organization by the horticultural division. With a change of horticultural innovation commercialization and application, rural mechanization suggests more organized association works and a development of farming advancement and application, mechanization data of agribusiness area and reputation ID of expert capacities of capable masters (Li et al., 1999). CGE-micro simulation model to investigate the agricultural modernization, structural change and pro-poor growth: policy options for the democratic republic of Congo and found that the labor using technological changes can sufficiently reduce poverty through income growth effects while capital utilizing changes prompts development (Otchia, 2014). For the purpose of guarantee food safety increase the level of agricultural modernization is a significant feature. Labor are liberates by increasing the level of agricultural modernization. Productivity will enhance when utilizing the mechanical methodology since its generally supplanted difficult work. The utilization of science and innovation in horticulture has significantly expanded nourishment creation, advancing sustenance generation increase and scale levels (Jie and Hui, 2014).

China's agricultural sector grew at five percent annually in the previous three decades since the late 1970s. China's rural area has changed drastically since the late 1970s. It developed at around 5 for every penny yearly in the previous three decades. Although noteworthy growth has happened in almost all cropping sectors, some crops production has developed all the more rapidly. In developing

countries introduced the importance of agricultural research and extension that increased the agricultural productivity. Agriculture is basic industry of China that plays an imperative role in the food security social strength. In the transformation of technology the specialists and innovation exchange service individuals play a significant role. Different research and empirical studies can lead to many outputs that could provide the directions of allocations of resources making policy. The investigation of rural protected innovation and perceptive agriculture growth procedures in China (Ren et al., 2017). Agricultural extension services in developing countries such as Pakistan aim to address crop production and management issues. Most significantly, the extension services meant for agricultural development through enhancing farmers technical knowledge, farm management skills, and effective information system, which is in the long-term leads to improved production, increased economic return and a boost to the national and global economy (World Bank, 2010). In China, agricultural productivity can increase by admitting innovations in the technology, yet it must deal with the shortage of water. Water deficiencies and expanding rivalry from industry and residential utilize offer little seek after extensive increments in the zones underwater system and related prolonged output. China has putted significantly in modernizing its farming division. The overhauling of swine production, for instance, is driving changes in the feed business. Local and outside ventures are likewise streaming into seeds, synthetic substances and machinery for grain creation. Receiving innovation and modernizing agriculture are a piece of China's long-term system for the manageable improvement. Expanding accentuation will be set on areas, for example, farmland protection and asset sparing innovation, biotechnology, plant and creature wellbeing, and infections, enhanced cultivating practices and motorization, post-collect treatment, circulation, and chilly chain coordination, and overhauling horticulture preparing offices. Outside speculation could assume a conspicuous job in these areas. As US horticulture keeps on applying the latest innovation and accomplishes an unparalleled level of profitability, the support of the US agriculture division and financial specialists in modernizing Chinese horticulture will create awesome advantages for the two nations.

### 3.1. Mechanism change is necessary for agriculture development

To demonstrate a positive association between development in the agricultural GDP and its lagged values and non-agricultural GDP development utilizes panel data of 65 developing countries from 1960-1985. Relationship can be clarified at the first difference, growth agriculture effect on bringing down prices of food, capital movements from agriculture, and movements of workers, increases efficiency of workers by increasing the food



consumption (Timmer, 2002). By using data from 1960-1995 of cross-section countries and found the positive connection between various methods of agriculture efficiency and average growth of the real per capita GDP (Self and Grabowski, 2007). Growth of national GDP per capita agriculture does not appear to be an essential power (Gardner, 2005). Developed countries have their economic markets which dominant in economic system. In this manner, markets systems of developed countries industrial sector contented with transformation of agriculture sector. Agricultural market features touch market stability and achieve economic benefits in the process of transformation of agricultural production technology and industrial organization system. It is the self-affiliation system in which a country can achieving a balance in benefits and an inward consistency between factors, structures, the plant part and diverse workplaces, in this way achieving a change in benefits (Ferguson and Smith, 1999).

China tries to stimulating agriculture modernization are directed with allocations of resources with the joint role of self-association (market system) and association framework (Government). Be that as it may, these two frameworks are in struggle and limitation. Along these lines, the thing is that how to organize market system and government's power with the agricultural industrial transformation. Government system can accomplish fast change in the modernization of agriculture system than market system because they have no real way to accomplish inner consistency and outer coupling, conversely, market system facing the rational limitations and just involve to solving internal consistency and external coupling. Consequently, role of market in this process all those issues. In order to ensure the agriculture security and dispose the barriers government should need to promote agriculture modernization, growth of agriculture sector, encouraging related organization.

### 3.2. Agriculture modernizations, innovations in rural and urban farming system and land transfer

Recently in the rural china, a prominent and overpowering feature is agriculture modernization and land transfer. Development of agriculture modernization or scaled up agriculture land transfer has been viewed as a necessity requirement. Scale of land transfers in China from 2008 -2013 which shows area of land transferred in millions is greater than presents is presents in Fig. 7. Since present day agriculture ordinarily requires certain scale, which is thought basic that the modest land plots shrunk by singular laborer ought to be exchanged to the current homesteads.

Large scale farms have high productivity in incorporating agricultural resources because they are not controlled by land proprietorship and assimilated plantation and less development cost in exchange in the developed countries. Conversely,

land system truly prejudiced the agriculture and scale agricultural plantation in China despite including limitless exchange cost. In this manner, with current irreversible industrialization drifts, the way to China's rural mechanical association lies in getting through the confinements of provincial land contract framework. The important factors of modern agriculture system are scaled-up agriculture and scientific agriculture. Hence, all policies which who linked to agricultural and rural development are extremely highlighted the agricultural science and technology. The use of present-day science and innovation was at that point categorically underlined by the local government in the collectivization time frame. These days, agricultural science, innovation and research are generally perceived as the essential reason for current agriculture progress. Modernization of agriculture is one of the major and basic choices of a country's strategic measure additionally economic development. Notwithstanding, despite its 50 years process, traditional agriculture still not change with agricultural modernization. Chinese real GDP growth from the period of 1979 -2017 in percent is illustrated in Fig. 8. To forecast Real GDP Growth of China for the period of 2007 to 2017 and forecasts over 2022 (%) are presents in Fig. 9. The fundamental reasons lie in that China's rural modernization neglects to take after the essential principles of system theory, over-underscores the mechanical change of an agrarian framework while disregarding that in the mechanical association.

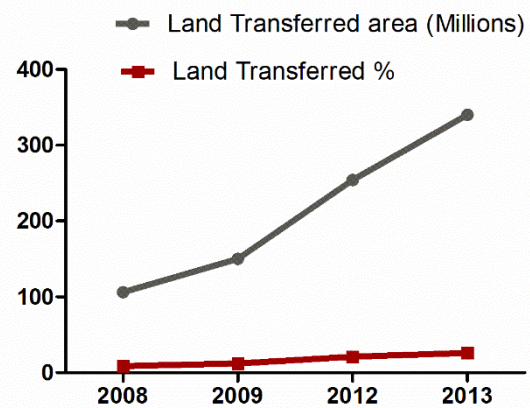


Fig. 7: Scale of land transfer in China

It is fact that the production at domestic level connected with the growth in demand. Numerous investigations have discovered that the ascent in supply, and also in all out factor profitability, was created by a lessening in the twists underway motivating forces that was driven by changes, for example, enhanced property rights and more open access to new technologies (Lin, 1992). Multiple regression analysis and a pooled data set on 15 countries at six points of time ending in 1980 was used to investigate the relationship between increase in agricultural protection and the decline in the agriculture's comparative advantage and found solid association between the aggregate nominal

way ostensible rate of security and the list of agribusiness' work profitability in respect to the aggregate economy's work productivity. Contingent that the abnormal state of farming assurance in East

Asia was made not such a great amount by factors, but rather for the most part by factors common to every single mechanical nation.

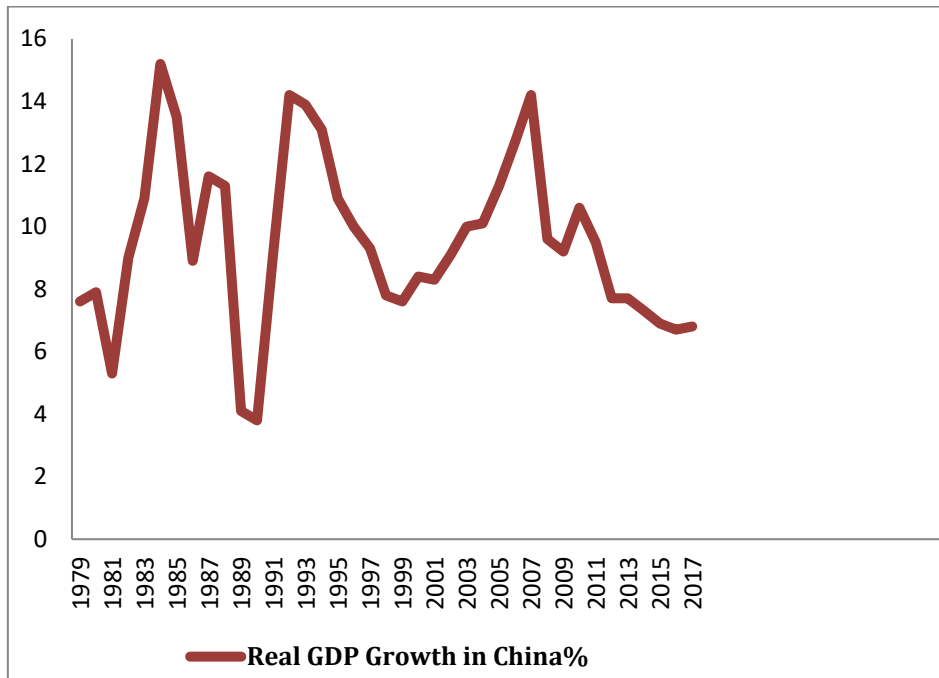


Fig. 8: Real GDP growth in China

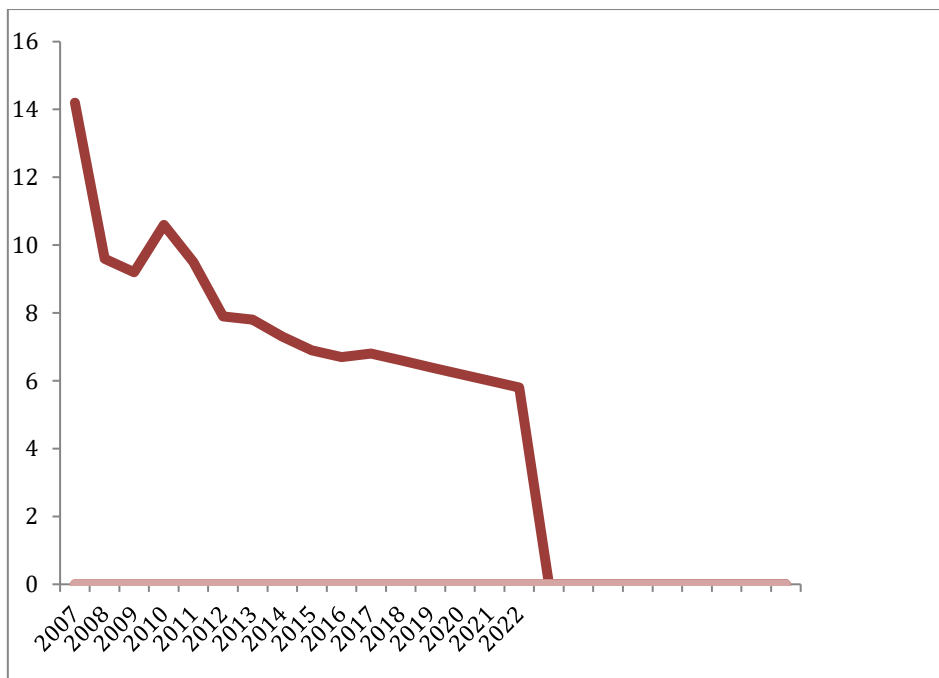


Fig. 9: China's Real GDP growth

#### 4. Contribution of agriculture sector in poverty alleviation

Income of poor people and expansion in the sectoral labor efficiency on GDP growth was estimated and found that in the developing countries, an increase in agriculture labor productivity cause average about 2.9 times more effecting in increase the overall GDP growth and boost the income of poor people. On the other hand, in non-agricultural labor productivity is

proportionate raise in GPD growth (Ravallion et al., 2007). Sectoral development on headcount poverty rate as opposed to on the wage of the poor people was assessed and discovered that growth of overall GDP come from agriculture in the poorest quarter of countries about 2.7 times more successful in diminishing 1\$/day poverty and in the richest quarter of countries its affect about 2 times more development originating from non-farming (Christiaensen and Demery, 2007). Annual data of 21 years on poverty was used to investigate the impact

of sectoral growth on headcount poverty rate. The result shows that poverty reduction has 3.5 times larger in primary sector than secondary sectors (Ravallion et al., 2007). From a more drawn out term point of view, the most basic and evident commitment has been the immediate commitment of agriculture development to bring down nourishment costs, and along these lines higher expectations for everyday comfort summarized. With the agrarian development, the non-cultivate area appreciates to bring down real wage costs, which yields leases that strengthen ventures and basic changes in a congested economy.

Agribusiness keeps on being a crucial instrument for the feasible improvement and poverty easing even in the 21st century, and it is especially valid in creating nations (World Bank, 2008). It is the essential wellspring of food and in the meantime gives crude materials to ventures, while additionally adding to the family and national economies. Rural development can support profitability, increment

cultivate earnings and animate linkages amongst cultivate and non-cultivate neediness decrease programs. Studies demonstrate that about 86% (2.5 billion individuals) of the provincial populace in creating nations is straightforwardly subject to the horticulture area (Li, 2007; World Bank, 2007). Farmers still record for the real extent of the aggregate population in numerous creating nations, and they fulfill their wellbeing and instructive needs from wages collected through agribusiness (Jan et al., 2008). Augmentation benefits in creating nations have assumed essential parts in the farming improvement and insolvency reduction (World Bank, 2002; Ravallion and Chen, 2007). Poor people from the period of 1981 to 2004, China are showed in Fig. 10. Agriculture drive fast industrial and services to investigate this viewpoint using cross-country data for 55 countries with influences of observations. Poverty reducing 2.9 times more in the growth of agriculture sector and 1.8 times more in growth of manufacturing sector.

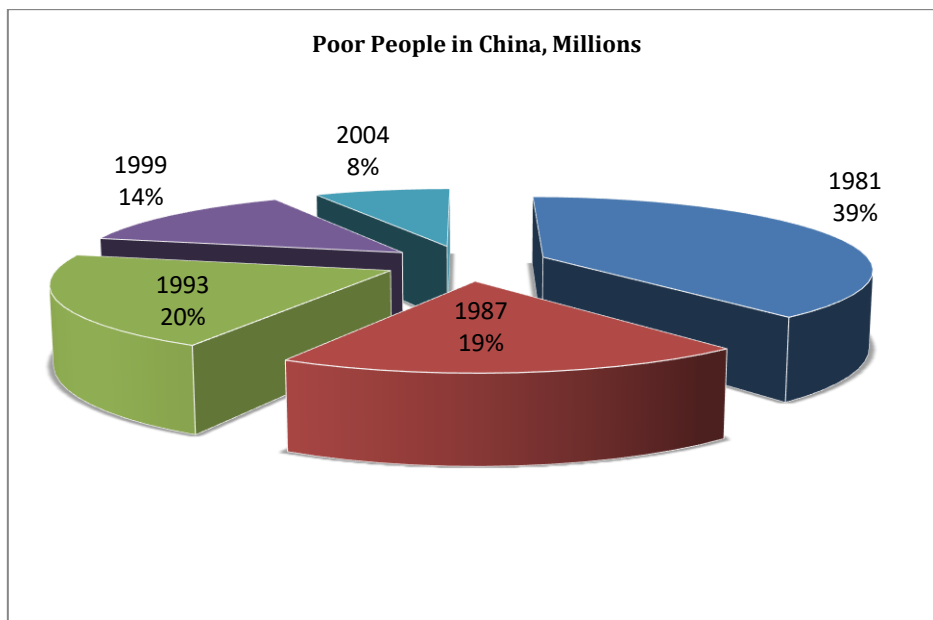


Fig. 10: This bar graph indicates the consistent poverty alleviation in People Republic of Poverty in China (Ravallion and Chen, 2007)

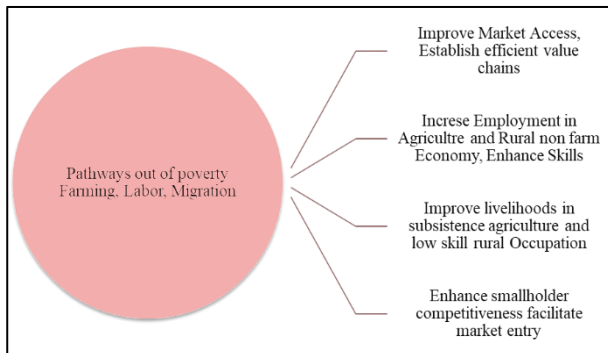
The growth of China is one of the supernatural occurrence development stories of the last piece of the 20th century and the early piece of the 21st century. Its economy has been the quickest developing when contrasted and world economies since 1980 (Cypher, 2014). Development has happened in all segments, including agribusiness. In the previous 30 years without a doubt the level of destitution tumbled from 260 million out of 1978 to 14.8 million (Sicular, 1995). Open spending affects the country neediness through numerous channels. It expands ranchers' wages specifically by expanding agrarian efficiency, which thusly decreases rustic neediness. Circuitous effects originate from higher rural wages and enhanced non-cultivate work openings prompted by development in farming efficiency. Expanded farming yield because of open speculation frequently yields bring down sustenance

costs, again helping the poor in a roundabout way since they are regularly net purchasers of nourishment grains. Notwithstanding its efficiency affect, open spending straightforwardly advances rustic wages, non-cultivate business and movement, in this manner decreasing country poverty.

#### 4.1. China's unprecedented reduction in rural poverty

The poverty ratio in China decreased in the previous 25 years is uncommon. Estimation shows that neediness tumbled from 53 percent in 1981 to 8 percent in 2001, hauling around 500 million individuals out of destitution rural neediness tumbled from 76 percent in 1980 to 12 percent in 2001, representing seventy-five percent of the aggregate. The advancement of neediness has been

exceptionally uneven after some time, in any case. The keenest lessening was in the mid-1980s, with some inversion in the late 1980s and mid-1990s. Due to the different information and techniques utilized, the assessments for Chinese farming shift significantly evaluated the PSEs for China over the period 1985–1995 (Von Braun et al., 2005). Outcomes demonstrate that Chinese help to horticulture was as yet negative until 1994, yet in 1995 it ended up positive at 4% of aggregate generation esteem (Rozelle and Huang, 2003) likewise evaluated PSEs for Chinese farming. Fig. 11 illustrates the pathway of poverty reduction.



**Fig. 11:** Pathways out of poverty farming, labor and migration

The sharp decrease in poverty from 1981 to 1985 was impelled by rural changes that began in 1978. The family obligation framework, which doled out solid client rights for singular plots of land to country families, the expansion in government obtainment costs, and halfway value advancement all, had solid constructive outcomes on impetuses for singular ranchers. In the underlying long stretches of the changes horticultural creation and productivity expanded significantly, to some degree through rancher's reception of high-yielding cross breed rice assortments.

## 5. Conclusion

This paper has reviewed the economic literature related to the role of agricultural modernization and its impact in development of economy also explored the impact of new agricultural technology on poverty reduction. Impact of new agricultural innovation on livelihoods affirms that innovation adopters got a measurably huge substantial increment in farming wage from water system more than the non-adopters by and large even within the sight of key factors that decide income. Then again, the non-adopters have a tendency to have greater changes in different wellsprings of wage than the adopters within the sight of key factors that decide pay. Since the key inquiry is the means by which to utilize farming in help of a supplementary change of the economy, we started by looking at the pretended by agribusiness in the advancement procedure and its cooperation's with different segments.

Agriculture development has an enormous ability to lessen destitution in poor nations. Agribusiness

could be a motor of development and give business chances to the country non-cultivate economy in light of its linkages with little urban communities and provincial zones. Provincial advancement and network driven improvement could aid this procedure. Governments should assume an essential part for a large number of the undertakings recommended. They ought not, notwithstanding, be the main source. The private division will be the fundamental wellspring of venture reserves and a provider of administrations. Contributors, nongovernmental associations, and common society associations will equally assume a key part. Recognizing the correct blend of these performing artists and building up successful collaboration among them will be essential.

## Compliance with ethical standards

## Conflict of interest

The authors declare that they have no conflict of interest.

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