



Article

Assessment of the Impact of Agriculture on Economic Growth

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Abstract: This article examines the impact of agricultural production on economic growth. a review of scientific literature on the impact of agricultural production on economic growth was carried out. The dynamics of the added value created in agricultural production, its share in GDP, the composition of producers, the share of the population employed in the sector and other economic indicators were analyzed. In the performed regression analysis, it was found that the rise in the proportion of the working population in this industry positively impacts the rise in the proportion of added value generated in agricultural output. Based on the study that was done, pertinent conclusions were drawn.

Keywords: Economic Sectors, Agriculture, Value Added, GDP, Economic Growth, Income, Employment, Farms, Peasant Farms.

1. Introduction

Agriculture is one of the most important sectors in the economy of any developing country. The territorial characteristics of agricultural production and the conditions for ensuring economic growth in a particular region are of particular interest. Agriculture also ensures economic transformation stability in developing countries by increasing incomes and stimulating the modernization and diversification of the economy. The study of trends and factors in the development of agriculture is of particular relevance in view of the need to develop the economy of regions, both from the point of view of production from available natural raw materials and from the point of view of consumption of basic food products. Increasing the efficiency of agriculture is of great importance not only for the economic development of the country, but also for social reasons, since agriculture serves to increase the well-being of the population of the regions and ensures the development of rural settlements (Drozdova, 2013).

Agricultural producers, firstly, are buyers of industrial products - machinery, fertilizers, technology, equipment for processing plants, and secondly, they play an important role in the development of industry in the regions as suppliers of raw materials for food, light and other industries. According to the results of the conducted research, in recent years, significant changes have been taking place in the economic development of developing countries in general, and in the agricultural sector in particular. This confirms the emergence of new debates about the role of agriculture in economic growth and once

Citation: Inomjonova, F. A. Assessment of the Impact of Agriculture on Economic Growth. American Journal of Economics and Business Management 2024, 7(12), 1304-1312.

Received: 21st Sep 2024

Revised: 29th Sep 2024

Accepted: 20th Oct 2024

Published: 25th Nov 2024



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again confirms the understanding of not only the important role of agriculture, but also the importance of the links between the agricultural and non-agricultural sectors, agriculture and other activities, and non-agricultural regions (Pan, 2024).

2. Materials and Methods

With global technological change at a high level and increasingly integrated markets, prices are falling faster than profitability. As a result, incomes of people employed in agriculture are falling, despite increases in productivity. The integration of rural areas with cities means that labor resources are moving away from agriculture to other high-value-added sectors. This has led to increased complexity in agricultural markets (and value chains). This excludes traditional smallholders who are not well equipped to meet the strict product specifications required by expanding markets and who are ill-equipped to deliver on time. Finally, multiplier effects occur when changes in costs lead to disproportionate changes in aggregate demand. Thus, increases in costs cause national income and consumption to exceed initial costs. However, the question of how important this multiplier effect is, especially when rural poverty persists at a high level, as is the case in middle-income countries, with GDP growth and a decline in the share of agriculture, is raised (Meijerink & Roza, 2007).

Matsuyama (1992) argues that high efficiency in agricultural production enhances industrialization processes and ensures long-term economic growth. High productivity in agricultural production increases employment in the industrial sector in developing countries and ensures economic growth (Chang et al., 2006). Agricultural production is one of the important sectors of the country's economic development through economic factors. In regions with a low level of industrial development, production is largely dependent on labor resources. The impact of agricultural production on economic growth is high, and this is especially noticeable in developing countries such as India, where it employs half of the population (Alston & Pardey, 2014).

According to Awan and Alam (2015), the agricultural sector is the largest sector of the Pakistani economy, employing half of the available labor force and contributing a quarter of GDP (21.4%). The overall growth rate of the economy depends on the growth rates of this sector. An empirical analysis of the impact of agricultural production productivity on economic growth found that the country's economic growth is affected by an increase in the labor force, high levels of trade openness, positive trends in agricultural value added, and a decrease in the cost of production inputs. Productivity in agriculture leads to increased efficiency in the industrial sector of the economy and ensures an increase in employment in the country. Apostolidou et al. (2014) argue that research shows that, especially in times of economic crisis, when all approaches to growth are being reconsidered and reassessed, agriculture can become a driving force for growth in a number of European Union (EU) countries and play a stabilizing role in the EU economy as a whole (Ali, 2020).

On the effect of agricultural output on economic growth in emerging nations, there are conflicting findings, nevertheless. Since improvements in GDP are negligible, Asom and Ijirshar (2020) specifically contend that the value added produced in agricultural output does not support economic growth in poor nations. Agriculture's contribution to a nation's GDP and the intricate relationships between its effects on rural residents' well-being are two instances of how this sector is evidently important (Chernova et al., 2022). A link between GDP growth and agriculture has been demonstrated by several empirical investigations; however, this does not always indicate a cause-and-effect relationship. But the reported association can be erroneous if both sectors expand on their own or because of a third reason. Thus, in their empirical study, some writers address the endogeneity problem and conclude that the agricultural sector has a causal influence on economic growth (Meijerink & Roza, 2007).

Using panel data methods like Granger causality tests, Bravo-Ortega and Lederman (2005) re-estimated the relationship between agricultural expansion and total economic development for the years 1960–2000. They maintained that there is no negative link between agricultural production growth and non-agricultural GDP growth in rich nations, but it does in emerging ones. Tiffin and Irz (2006) also found similar results when they used Granger causality tests in panel data to overcome the endogeneity problem and investigate the direction of causation between agricultural value added and GDP per capita in 85 countries. The findings of these economists' studies indicate that agricultural value added boosts GDP growth in poor nations, but the exact cause of this association is unclear in wealthy nations—with the exception of those with fiercely competitive agricultural markets. Thus, on a broad scale, agricultural development indirectly influences economic growth. Furthermore, the expansion of regional output and employment have a big influence on economic growth. Economic development is greatly impacted by rising production rates since they boost agricultural value added and encourage an open market approach (Awan & Aslam, 2015; Hu et al., 2022).

Based on statistical data for the years 2003–2021, Jussibaliyeva et al. (2022) performed a regression analysis to evaluate the effects of agricultural investment, productivity, the number of livestock and poultry, gross agricultural output, interest rates, and unemployment on economic growth (GDP per capita). The investigation concluded that economic growth is positively impacted by agriculture production and investment. Enhancing knowledge and abilities and assisting small and medium-sized enterprises, particularly in rural regions, are two ways to promote agricultural growth (Samantaray, 2024). For instance, the experience of African nations has demonstrated that public investment in educating the local populace has aided in both economic expansion and the fight against poverty. It is important to remember that centralised regulation by government organisations has been the biggest barrier to implementing a strategy of knowledge expansion in the agriculture sector. Reducing rural poverty can be achieved in large part by modernising agriculture (Hilden et al., 2012; Berhanu & Poulton, 2014). Because it provides raw materials to industry and consumes industrial goods, agriculture serves as both a buyer and a seller. After then, it pays taxes to the national budget. It should be mentioned that the majority of agricultural producers in emerging nations are small and medium-sized businesses. In nations with low levels of industrialisation and significant unemployment, this is an additional means of giving people jobs and access to inexpensive labour. After five years, a 0.5-ton improvement in the productivity of key agricultural crops lowers the labour share in agriculture by 4.6-5.6 percentage points and raises GDP per capita by 14-19 percent. The findings indicate that a major factor propelling structural change is agricultural production (McArthur & McCord, 2017). A country's rate of economic growth is generally impacted by rising agricultural production, which also enables emerging nations' economy to diversify (Salah and Mouzarine, 2019).

3. Results

The research study examined the importance of the agricultural sector in the economies of countries, the impact of agricultural production on economic growth, and conducted a review of scientific literature. At the same time, based on statistical data prepared by international organizations, the Statistics Committee, and the Central Bank, the dynamics of added value created in agriculture, its share in GDP, the composition of producers, the level of employment, and other economic indicators were analyzed. The article assessed the impact of the share of the population employed in this sector on the share of added value created in agricultural production by regression. Based on the conducted analyses, relevant conclusions were drawn.

The research used methods such as scientific abstraction, analysis and synthesis, induction and deduction, descriptive statistics, comparative analysis, regression analysis, and analysis.

4. Discussion

It is crucial to diversify agricultural production, enhance land-water relations, establish a favourable agribusiness environment and high-value chain, encourage the growth of cooperative relationships, introduce market mechanisms and information and communication technologies widely, and make efficient use of scientific advancements.

Market principles are widely applied in the republic's agricultural product purchases and sales, exports are encouraged, a favourable agribusiness environment and value-added chain are created, competitive, high-added-value agricultural and food products are produced for the target international markets, the network is modernised and diversified, and the flow of private investment capital is increased to support sustainable growth and make investment factors more appealing. Important tasks include developing scientific research in the field, ensuring balanced and sustainable development of rural areas, improving labour productivity, improving product quality, and increasing efficiency through the development of network programs aimed at creating high added value.

Although in previous periods there has been an increase in the dynamics of the volume of value added created in agriculture, a decreasing trend can be observed in its share in the total value added created (Table 1). The growth rate of value added created in agriculture Although in the periods after 2018 there have been decreasing trends in the growth rate of value added created, Relatively increased in 2021 and 2023.

Table 1. Dynamics of Added value created in networks (in percents), Statistics Agency, 2003

Indicators	2018	2019	2020	2021	2022	2023
Growth rate of total added value created in industries	133,1	128,3	113,5	123,2	121,8	121,2
including in agriculture	124,9	114,6	115,9	120,8	114,9	117,4
Share of agriculture in total created value added	26,5	23,6	24,1	23,7	22,3	21,6

In particular, as a result of the restrictions imposed in 2020 due to the COVID-19 pandemic and measures taken to support production, the growth in value added in 2021 was 120.8 percent, and in 2023, the value added in agricultural production amounted to 245,222.5 billion soums at current prices, an increase of 117.4 percent compared to 2022.

To date, the value added in agriculture in countries around the world in the period from 2000 to 2021 increased by 84 percent in real terms, reaching 3.7 trillion US dollars (Figure 1).

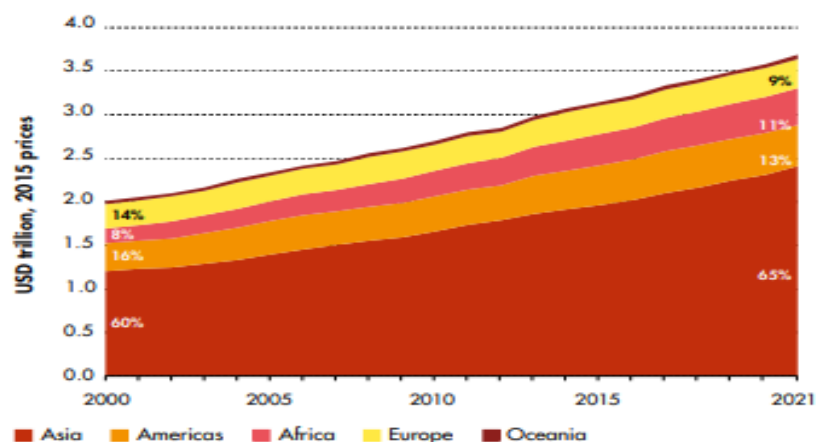


Figure 1. Dynamics of added value created in agriculture by region, FAO, 2023

Until 2019, the global contribution of agriculture to gross domestic product (GDP) decreased, which is explained by the decrease in total GDP. In 2020, due to the COVID-19 pandemic and various restrictions implemented to prevent the pandemic, the volume of value added in the industrial and service sectors decreased, while value added in agriculture continued to grow, which led to a sharp increase in the share of agriculture in total value added in 2020. (Figure 2).

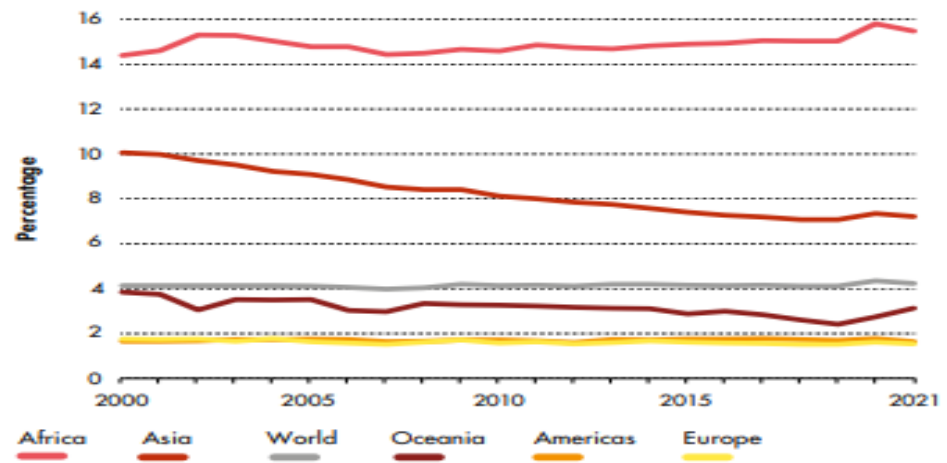


Figure 2. Agriculture's percentage of GDP value added by region (in percent), FAO, 2023.

With the exception of Africa and the Americas, the GDP share of agriculture fell between 2000 and 2019, but it subsequently rose in all areas between 2019 and 2020. The GDP proportion of agriculture in 2021 was greater than in 2019, with the exception of the Americas, and it was higher than in 2000 in the African area (14.5 percent in 2000, 15.5 percent in 2021). Since the COVID-19 pandemic mostly affected a few nations, which accounted for 46% of the total value added generated in agriculture in the African area in 2021, the unusual rise in the region's agricultural GDP share may be explained. A significant part of Uzbekistan's economy is agriculture. Approximately 24.0% of the workforce is employed in the agriculture sector, which accounts for about one-fourth of the nation's GDP. Farmers' and homesteads' contributions account for the majority of the republic's agricultural output. For instance, farmers and homesteads provided almost 60% of today's agricultural output, followed by farms (30%) and other agriculturally orientated businesses (8%), as seen in Figure 3.

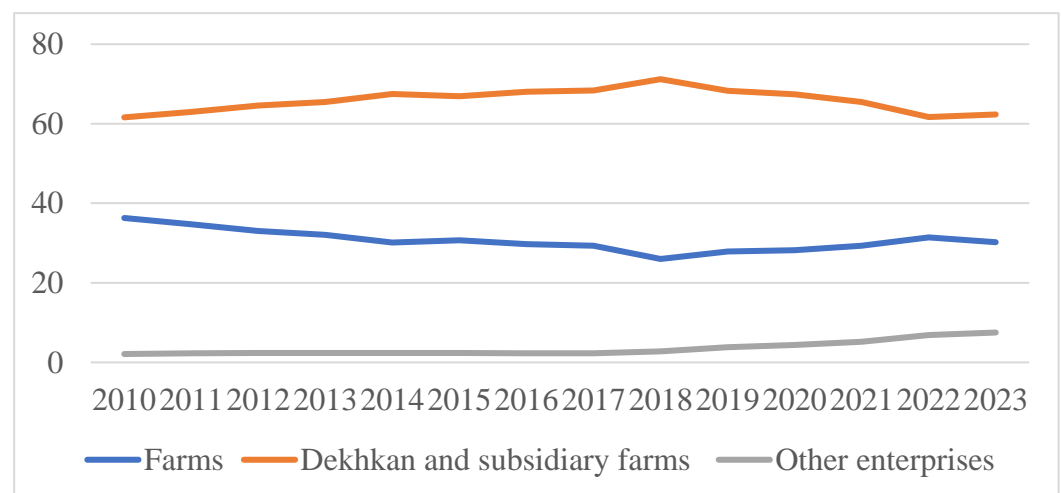


Figure 3. Share of producers in agricultural products (in percent), Statistics agency, 2023

According to statistical data, by 2023, the main share of livestock products produced in the republic, 87.8%, fell to peasant and household farms, while the shares of livestock products, 6.4% and 5.8%, respectively, belonged to farms and other enterprises engaged in agricultural activities (Figure 4). Although the share of peasant and household farms in the production of livestock products has decreased since 2010, the share of other enterprises engaged in livestock activities has increased. The share of products produced by other enterprises engaged in livestock activities amounted to 3% by 2017, and has doubled over the past 6 years. The share of farms in the produced livestock products increased from 3.7% in 2017 to 6.4% by 2023.

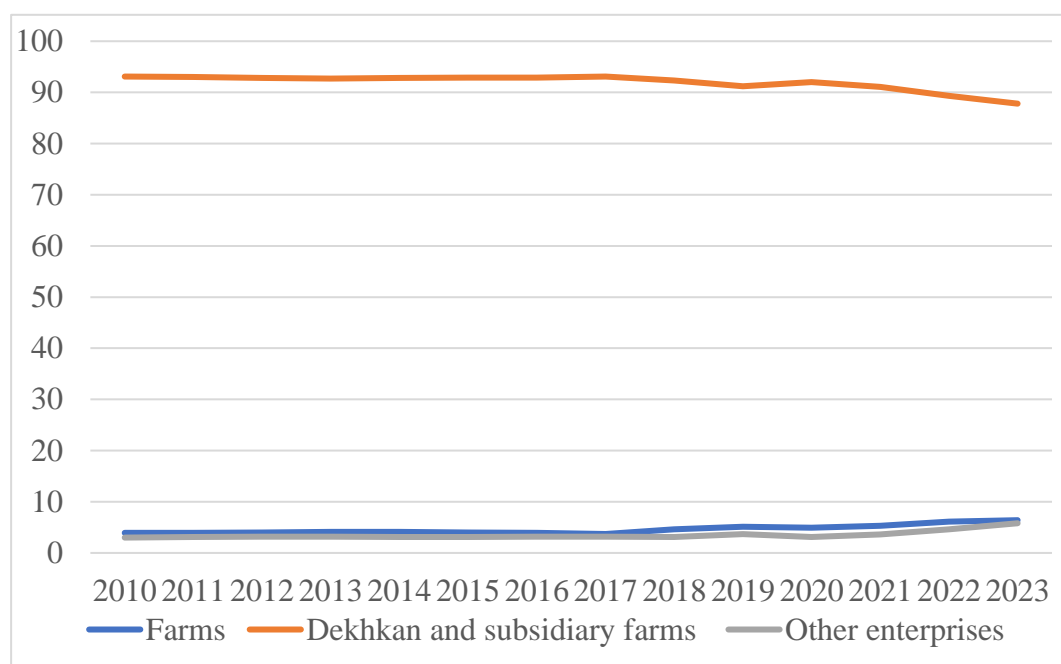


Figure 4. Share of producers in livestock products (in percent), Statistics agency, 2023

According to statistical data, in 2023, the number of people employed in agriculture amounted to 3,344 thousand people, with an average monthly salary of 2,706,771.0 soums. Compared with other sectors of the economy, the average monthly salary was 5,179,730.8 soums in the construction sector, 5,456,852.7 soums in industrial production, 10,596,006.9 soums in the information and communications sector, and 13,357,562.9 soums in the finance and insurance sector. In general, the average monthly salary for those employed in agriculture is the lowest compared to other sectors of the economy. The share of agriculture in loans allocated by commercial banks to sectors of the economy decreased by 2.3 times (Table 2). A sharp reduction in the volume of loans allocated by commercial banks may have a particularly negative impact on small business entities operating in the agricultural sector.

Table 2. The share of agriculture in loans allocated by commercial banks to economic sectors (in percent), Central Bank, 2023

<u>Years</u>	Total allocated loans to economic sectors, <u>bln. Soum</u>	The amount of loans allocated to rural economy, <u>bln. soum</u>	The share in the farm, in %
2018	100658,2	13443,5	13,4
2019	140762,4	14051,7	10,0
2020	127207,5	18772,2	14,8
2021	166240,9	21133,2	12,7
2022	203126,6	15963,9	7,9
2023	251401,5	14602,5	5,8

The total amount of loans allocated by commercial banks to enterprises in the economic sectors in 2018 amounted to 100,658.2 billion soums, of which loans allocated to the agricultural sector amounted to 13,443.5 billion soums, or their share in total loans allocated to economic sectors was 13.4%. By 2023, total loans granted to economic sectors will amount to 251,401.5 billion soums (an increase of 2.5 times compared to 2018), while the amount of loans allocated to agriculture will amount to 14,602.5 billion soums, or their share in total loans allocated to economic sectors will decrease by 5.8%.

A regression analysis conducted based on macroeconomic indicators and labor market data from the Statistics Agency assessed the impact of the share of value added created in agriculture (Y-dependent variable) and the share of the population employed in agriculture (X-independent variable) over the period 2010-2023.

Table 3. Correlation matrix of the influence of factors on the share of added value created in agriculture

	Y	X
Y- share of value added created in agriculture, in %	1	
X- share of the population employed in agriculture, in %	0,839019	1

It can be concluded that there is a correlation between the dependent variable and the independent variables taken as influencing factors. Thus, it was found that there is a direct relationship between the share of value added created in agriculture (Y) and the share of the population employed in agriculture ($r=0.8390$) (Table 3).

Table 4. Results of the Regression analysis model

Multiple correlation coefficient R	0.83901959
Coefficient of determination R^2	0.70395388
corrected coefficient of determination R^2	0.6792833
Standard error	2.36465951
Observations	14

The multiple correlation coefficient $R=0.83901959$ characterizes a strong statistical relationship between the dependent variable (share of value added created in agriculture) and the independent variable, which is one of the influencing determinants, the share of the employed population in agriculture. The closeness of the multiple correlation coefficient to 1 means a direct and very strong linear relationship between the indicators. The determination coefficient $R^2=0.70395388$ indicates that the indicator value tends to 1, indicating the adequacy of the relationships, and the 70.4% change in the share of value added created in agriculture is explained by the change in the selected independent variable (Table 4). Given the high level of dehqan and household farms in the production of agricultural products, it is natural that the increase in the share of the employed population in the sector has a high impact on the growth of the amount of value added created in agriculture.

Table 5. Results of Variance Analysis

	df	SS	MS	F	Importance F
Regression	1	159.552	159.55	28.534	0.00017
Remainder	12	67.099	5.59		
general	13	226.652			

According to the results of the analysis of variance, the model is significant and statistically adequate to the data, since the Fisher adequacy criterion ($F_{\text{calculated}} = 28.534$) is greater than the tabulated value of the Fisher criterion (0.00017) (Table 5). The actual value of the F-test at the significance level of $\alpha = 0.05$ is greater than its critical value.

Therefore, a probability of 0.95 indicates that there is a relationship between the dependent variable and the obtained independent variables. Thus, in 95 out of 100 cases, the share of value added created in agriculture depends on the selected indicator, so the econometric model is considered reliable.

Table 6. Point estimation of model parameters

	Coefficients	t- statistics	P- level of importance
Y- intersection	-58.034	-3,60177	0,0036
X- share of the population employed in agriculture, in %	3,247	5,34174	0,0001

According to Table 6, we build an econometric model:

$$y = -58.034 + 3.247x \quad (1)$$

The percentage of value added produced in agriculture might rise by 3.2% for every 1% increase in the population's employment in the sector. It should be highlighted, therefore, that boosting the flow of capital into the agricultural sector and using advanced technology in this area may have a statistically significant beneficial effect on a notable rise in the quantity of value added produced in agricultural output.

5. Conclusion

Of special relevance are the geographical features of agricultural output and the prerequisites for guaranteeing economic expansion in a given area. Furthermore, by raising wages and promoting economic modernisation and diversification, agriculture in underdeveloped nations guarantees economic development.

In emerging nations, high agricultural productivity guarantees economic growth and boosts employment in the industrial sector. One of the key areas of the nation's economic development based on economic variables is agricultural output.

An empirical study of the relationship between agricultural production productivity and economic growth found that rising labour force participation, high trade openness, rising agricultural value added, and falling production material costs all have an impact on the nation's economic growth.

Increased agricultural productivity boosts the nation's industrial sector's efficiency and creates more jobs. This is an additional method of giving people jobs in nations with high unemployment and low levels of industry by supplying them with inexpensive labour.

Diversifying agricultural output, enhancing land-water connections, fostering the growth of cooperative relationships, and establishing a favourable agribusiness environment and high-value-added chain are all crucial.

A significant part of Uzbekistan's economy is agriculture. The agriculture industry employs around 24.0% of the workforce and contributes about a quarter of the nation's GDP. Household farms and dehkan farms generate the majority of the republic's agricultural output. Dehkan and home farms generate the majority of the animal products in the country (87.8%).

A 1% rise in the proportion of the people working in agriculture can result in a 3.2% increase in the proportion of value added produced in agriculture, according the regression analysis's findings. It makes sense that an increase in the percentage of the population working in agriculture would have a statistically significant impact given the sizeable portion of household farms and peasant farms that contribute to agricultural production (they make up over 60% of agricultural output, including roughly 90% of livestock production). The fact that the majority of people in developing nations work in agriculture further supports the idea that agricultural output has a substantial influence on economic growth in these nations.

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