

## Research Article

# Improve the Design Intelligence through Wireless Networks to Increase Agricultural Production in Provincial Countries

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The agricultural field requires hard work and enough human resources to complete any agriculture tasks. Apart from these requirements, maintenance costs and services of the agricultural equipment have also to be considered. Therefore, according to the agricultural work essentials, the workforce has to be increased, and productivity can also be improved. However, it is not easy to find a human resource under certain rash circumstances. By then, the productivity of agriculture may get affected; to overcome this issue, specific intelligent systems can be introduced to manage the productivity of the provincial states of the country. According to the requirement of agricultural productivity, intelligent sensors can be fixed in the agricultural land to monitor the status of the land and crops to take precautionary actions. To implement this intelligent technology in this research, wireless sensors are fixed to collect data and perform analysis with the aid of intelligent decision support systems. The study results proved that the provincial countries have obtained increased agricultural production from 2014 to 2020.

## 1. Introduction

A new sort of agricultural reform is urgently needed in order to meet the ever-increasing demands of humanity. Increasingly sophisticated technologies, such as big data analytics and cloud computing, are being introduced to keep pace with the Internet's exponential growth [1]. It is anticipated that agricultural big data will have a significant impact on the profitability of farming operations in the next few years. According to recent research, agriculture is becoming increasingly popular as a means of production for farmers who are willing to give up their lands [2]. In response to growing concerns about food security, scientists and technologists have been developing new scientific and technological means of harvesting land resources. The resolution of the human-land conflict, as a result, will be beneficial to the advancement of society [3]. Farming big data is becoming increasingly popular, and it provides an excellent indicator of where agricultural information technology is now at. The application of big data analytics can aid in the transformation of the agricultural sector.

As a result of its historical and cultural significance, it is also an important supplier of raw materials to the national economy [4]. Agricultural production is the only mechanism through which the human race will be able to survive and prosper in the foreseeable future. The fact that agriculture is a basic element of everyday life means that it has a wide range of academic and practical applications as well. On the other hand, we keep up with the latest developments in agricultural production management and farmer appreciation [5]. When applied to rural excess labor land and other resources, this strategy can result in a more equitable distribution of those resources. The concentration of agricultural production in rural areas can contribute to the development of the agricultural sector [6]. New business models are required as a result of the modernization of agriculture, from farm to fork and beyond. The agricultural industry is under pressure to streamline its operations across the board as a result of the way the entire supply chain has been organized [7]. As a result, many new service sectors in the agricultural commodities market may arise, which will help to accelerate the modernization of agriculture. The analysis of the current

big data-generating environment presented in this article is used to construct a local agricultural model based on the actual agricultural production and management practices of rural families. The study undertake in-depth interviews with farmers and farmer organizations in order to gain a deeper understanding of their desire to be involved in the management of agricultural production [8]. At the end of the day, the study intends to obtain information about farmers' willingness and behavior in relation to actual agricultural production management. This model may be used to explore farmers' professional variance in their willingness and behavior to manage and distribute agricultural products, as well as their willingness and behavior to manage and distribute agricultural products. When it comes to developing a data platform for the agricultural single-product market, this study gives an example and experience that may be repeated for other systems of similar kind [9].

The fast adoption of the Third Industrial Revolution in the world's two largest industrialized countries in recent years has led to an increase in interest in big data research [10]. For professional farmers, the government offers a large subsidy for a new-style training program that is designed just for them [11]. Before we can have a prosperous agricultural system, we must first build the policy support infrastructure that supports it [12]. For policymakers to be effective in assisting professional farmers, they must take into account the distinctive peculiarities of their different locations. First, there are two major types of difficulties that need to be addressed [13, 14]. First, there is the issue of immigration. Much research on the use of big data in certain industries has been undertaken outside of the United States, and some of these studies have been published [15].

Feng believes that with the use of big data, farmers will be able to overcome previously insurmountable obstacles in the agriculture sector. The availability of data on a wide range of topics, from water supply to commodity markets to consumer preferences, is expanding all the time [16]. With big data, you can accurately predict and make timely decisions regarding the whole agricultural value chain. According to the researcher, using big data has a variety of benefits for farmers and other enterprises [17]. Farmers and businesses have both put in a significant amount of effort, money, and experience into data collection efforts. For farmers, "big data" brings a new set of challenges and opportunities, including how to manage and improve production efficiency while also improving the overall agricultural environment. In this case, the availability of information and the ability to make judgments based on that information stand to be compromised. Increasingly, the Internet of Things (IoT) is becoming significant in the field of big data farming (IoT). This Internet of Things (IoT) architecture makes use of databases and distributed programming frameworks to accomplish its objectives [18].

According to the researcher, the implementation of big data concepts, technologies, and methodologies can make the gathering, storage, and processing of agricultural data more efficient and productive [19]. In the agriculture industry, the principles and technologies of big data are

being put into practice. It is vital for farmers to make use of the vast amounts of data generated by agricultural information technology in the sectors of production processes, resources, food quality, and safety, and data generated by agricultural equipment or facilities, among other things. It is difficult for modern farmers to produce and run their enterprises in today's environment. Our primary objectives in market research and industry regulations are product manufacturing and operational strategy [20]. It is also critical to boost agricultural production as well as conduct more market research and projections in order to achieve this. There are various areas in which we want to make improvements in order to effectively manage and monitor the company's operations, including production and operational processes. Finally, he has contributed to the improvement of the organization's production and management by gaining and applying new skills in his current position. The alliance will collect information on everything from basic agricultural components to animal and plant production techniques and pest control strategies, as well as marketing and public health statistics, in order to ensure long-term preservation. Businesses, governments, and other organizations now have the ability to quickly "purify" and collect essential data from a variety of sources, making choices easier and helping the government sector as a whole. More than six out of ten farms (64 percent) used agriculture production management techniques. In order to improve agricultural production management, the government relocated 144 farm families from their original locations (82.76 percent of the rural households in flux). It was decided to bring in an additional 138 acres of farmland, although only 26.44 percent of the agricultural households were relocated as a result of this. On this platform, users have the ability to authorize access to the model's underlying data. 97 farmers, or 35.79 percent of all farmers, are actively engaged in agricultural production management [20]. This study focused on enhancing and improving the design intelligence through wireless networks to increase agricultural production in provincial countries.

*1.1. Motivation for the Study.* To best satisfy the needs of provincial countries' transformation while also increasing agricultural production growth, instructors in various institutions must find new ways of connecting employers' up-to-date preconditions for marketing in agricultural production as well as occupational realization. In this context, a prospective study was conducted using multimedia to assist educators in achieving their educational goal of producing graduates who are really qualified for social needs. We investigate methods of assisting farmers in gaining work knowledge and enhancing their agricultural production skills, computer experience, effective communication skills, and cooperation through the use of multimedia networks. Incorporating audiovisual networks into classroom training can also increase internships, improve teaching scenarios, and extend gross teaching hours, likely resulting in a more favorable educational setting and improved academic goals.

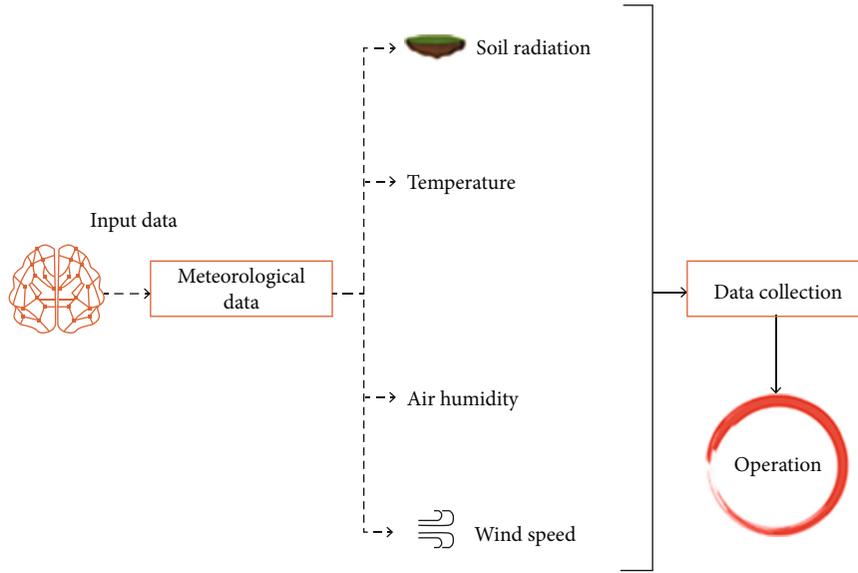


FIGURE 1: Sensor connections with AI and field process.

## 2. Materials and Methods

Farmers are working over the year to safeguard their fielding land and to get a proper yield at the end of yielding time. It is one of the most important applications of the involvement of artificial intelligence in agricultural land. According to the soil type, the variety of crops that are to be yielded on the soil would differ. Using a wireless sensor, it is possible to get the results from the soil about its natural and adaptability by using the pH value. Soil is always considered an important part in identifying the level of crop growing in the field. In Nigeria’s economy, it plays a major role, which means the production rate of foods, employability, and other such things. Some of the records have proven that our world population will increase from 7.6 billion to 9.6 billion by the year 2050. In this case, there would be a major rise in market value, demand, and supply of food products. This means that between 2030 and 2040, an average of 70% of food production should be increased.

With the help of computer vision, artificial intelligence works on the concept of monitoring a field and making some additional progress in it. Pest control is another major issue on agricultural land. Soil maintenance can also be rectified using the pH value received from wireless sensors. But identifying the presence of pests inside the large area is harder. Other than soil issues, if there are any food production problems, it indicates the presence of pest insects on the agricultural land. In addition to the two-sector problem created by an insect, indirect damage is another thing that can transmit the bacteria and fungus in the plants that are ready for the yielding process. Drones hold an important place in the field of connecting artificial intelligence with people and other technologies. Using this kind of AI machine, such types of harmful pests are identified by the farmer without getting into the field. It does not stop its process by identifying the pests that are present in the field. It makes some alterations, such as spraying the pesticides only

in the particular area where it identifies the presence of pests. Future prediction and early identification are the important things for crop production. In that case, AI and ML algorithms can be used to monitor climatic changes and take advantage of the land.

Within the soil managing techniques under artificial intelligence, there are major resources and algorithms such as DSS, ANN, and MOM. A DSS is a type of decision support system that aids in the reduction of nitrate solutions, resulting in an increase in crop production rate. But under the soil and algorithm that are to be used, there are some restrictions to be aware of. Secondly, the artificial neural network is the further process that works in the case of evaluating the texture of soil and analyzing the temperature, presence of soil moisture, and finally, the reports taken based on nutrients contained in the soil (refer to Figure 1). According to the limitations, AI creates flexibility and makes a stronger connection with the machine learning concept to help in all such cases for humans. A robotics autonomous system (RAS) is a recent technological improvement that helps in the development of global industrial management.

Increase agricultural output as a share of the revenue, as well as job growth falls, as is well formed in the development stage. The shift in  $S_1(k_1, \dots, k_n)$  production away from farming is being blamed on  $k_1, \dots, k_n$  production growth in nonfarm sectors. In practice, increasing agricultural output has proven to be a powerful factor, particularly in larger economies. In general, we can assume that authorities within the region have provided a  $H$  set of subsidized computation that will be referred to

$$\in = \left\{ S_1 = \sum(k_1, \dots, k_n), \dots \dots \dots, S_H = \sum(k_1, \dots, k_n) \right\}. \quad (1)$$

The quality of funds support  $A_h^m$  given to enterprise  $m$  in terms of rule  $S_H$  is measured by the amount of its most

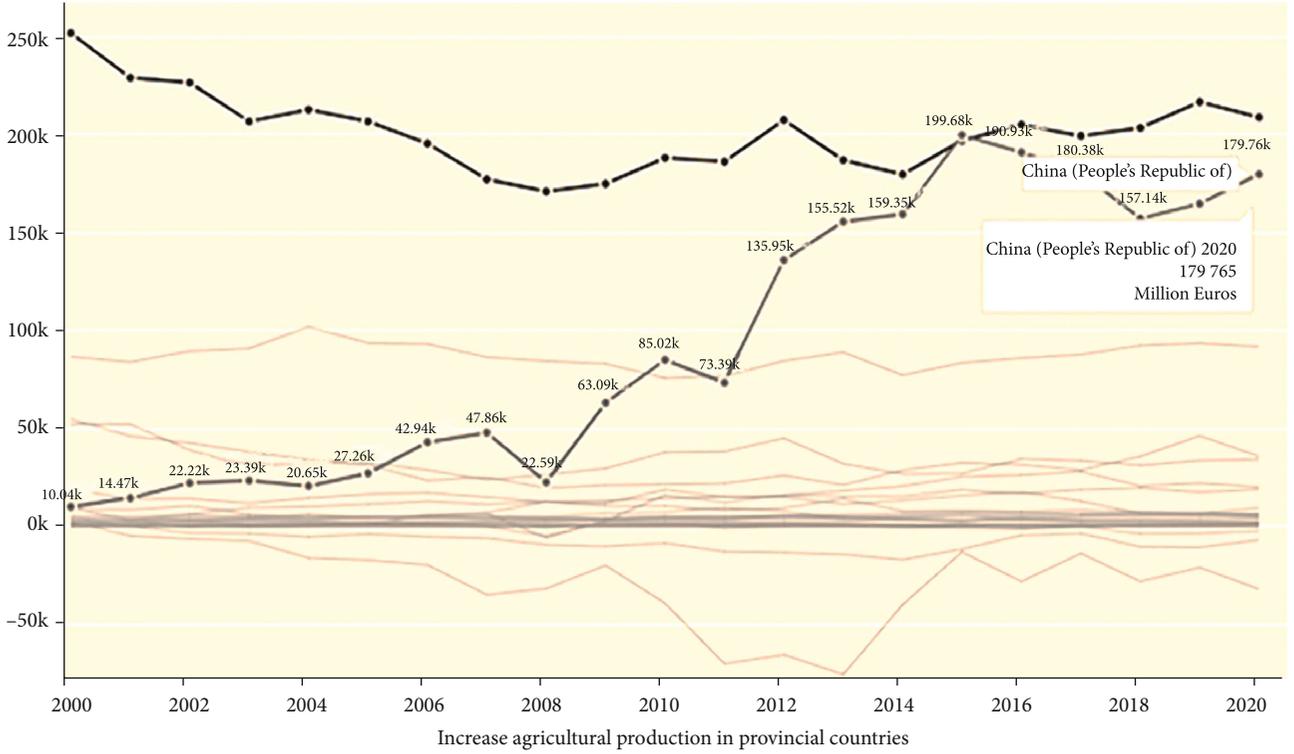


FIGURE 2: Performance analysis of enhanced agricultural production in provincial countries using artificial intelligence with wireless networks.

TABLE 1: Result analysis increase agricultural production in provincial countries using through the artificial intelligence through wireless networks.

Agricultural production in provincial countries	Quality (Yuan)
Fertilizer	83000
Credit	28000
Crop insurance	8500
Price support	25000
Total	237500
Power	98000
Irrigation	29500
Crop insurance	9500
Loan waivers	233300
Total	356300

recent financial statement performance indicators. Equation (2) does this calculation.

$$A_h^m = S_h \left( (k_1^m)^0, \dots, (k_n^m)^0 \right). \quad (2)$$

Every subsidized allocation rule should, of course, be fiscally sustainable. It means that the total quantity of a subsidy cannot exceed the total quantity of such a budgetary allocation to describe the following:

$$\sum_{m=1}^M A_h^m \leq A. \quad (3)$$

The area studied the link between socioproduction infrastructure investment indicators and indicators of subsidy person receiving performance. The  $\bar{D}$  set has been defined. For each indicator, the quantitative connection between its value and indeed the enterprise's performance measures is determined by the following:

$$D_j = D_j(k^1, k^2, \dots, k^M), j = 1, \dots, M. \quad (4)$$

Each cash allotment can be represented by a modified worth  $p_m(A_m, A_h)$ . The notion of reasonable resource allocations by management is concerned with developing a management strategy that will yield the highest possible production growth the following:

$$\pi^m(k^m, p_m(A_m, A_h^m)) \longrightarrow \max, \quad (5)$$

$$k_n^m = \varphi_n^m \left( (k^m)^0, p_m(A_m, A_h^m) \right), n, \dots, N. \quad (6)$$

On the condition by Equation (5),  $\pi^m(\cdot)$  is the business's income,  $k^m = k_1^m, \dots, k_n^m$  is the number of production performance indicators (varying models) (refer to Equation (6)), and  $m \times n$  is the principle for changing the value of indicator  $n$  for the organisation  $m$ . The representation of

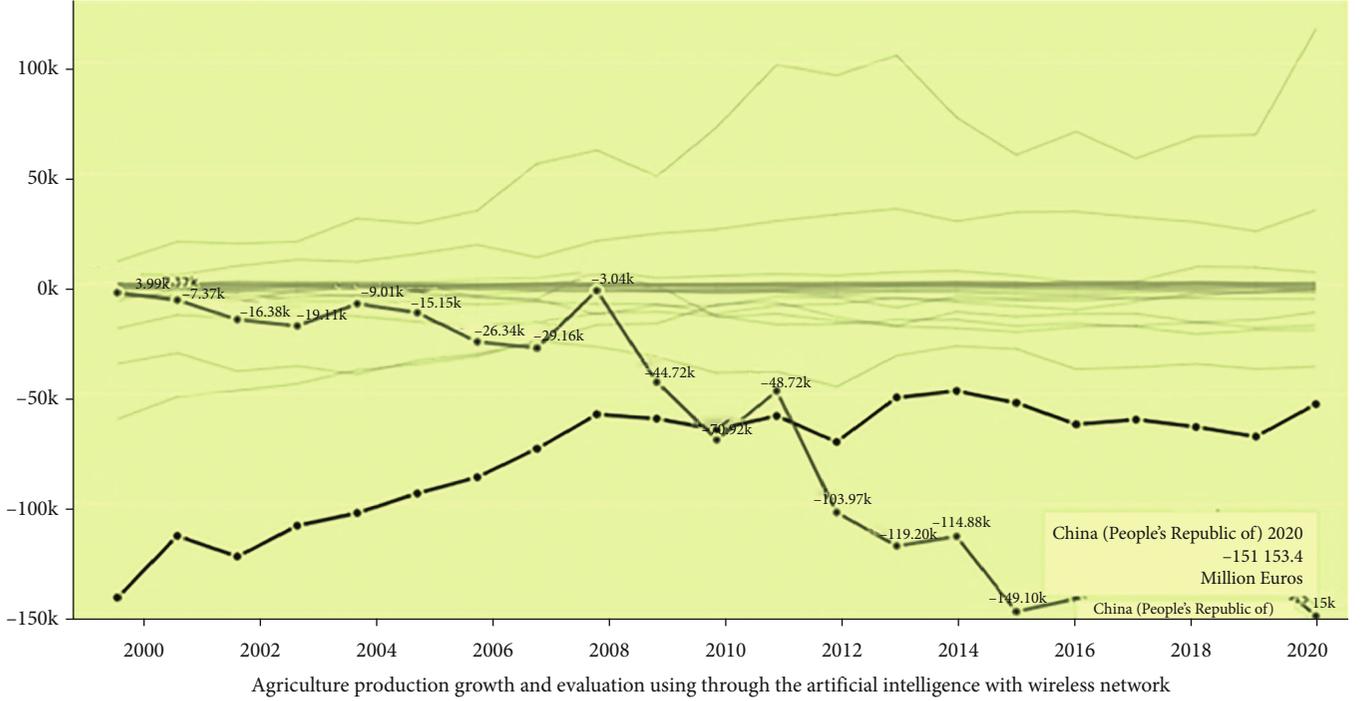


FIGURE 3: Growth of agriculture production in various countries using artificial intelligence with wireless network.

TABLE 2: Result analysis for agriculture production growth in various countries and evaluation using through the artificial intelligence through wireless network year.

Name	Source	Year	Magnitude (Yuan)
Fertilizer	Union economical	2017/18	85000
Power	Power finance establishment data	2015/16	98000
Recognition	Union budget	2017/18	26000
Irrigations	Essential Water Commission (2018)	2011/12	20000
Crop insurance	Union economical	2017/18	18000
Price funding	Author's approximation	2016/17-201/18	26000
Total (without filling to 2018/19 expense levels)			362000
Loan relinquishments	PRS governmental investigation	2018/19	241000

the production performance for multiple products can be represented in the following:

$$\tilde{k}_h^m = \left( (k_1^m)^h, \dots, (k_n^m)^h \right). \quad (7)$$

Following the third phase and is represented in Equation (8), all performance evaluation values that can be achieved through the rational allocation of resources for each subsidy recipient are established in relation to every subsidy determination stipulation  $S_h$  (where  $h = 1, \dots, H$ ).

$$\tilde{k}_h = \left( \tilde{k}_h^1, \tilde{k}_h^2, \dots, \tilde{k}_h^M \right), h = 1, \dots, H. \quad (8)$$

So each option for allocating a subsidy must be evaluated separately as in the following:

$$D_j^h = D_j \left( \tilde{k}_h^1, \tilde{k}_h^2, \dots, \tilde{k}_h^M \right), j = 1, \dots, J \quad h = 1, \dots, H. \quad (9)$$

Every subsidized option is available. The subsidy represent the application whereby each  $D_j^h$  visual displays falls inside the acceptable ranges  $T_j$  are chosen for further evaluation.  $H'$ : denotes a set of integers that must be evaluated separately in such rules as in

$$H' = \left\{ h : D_j^h \in T_j, j = 1, \dots, J \right\}. \quad (10)$$

To make that choice, you also must create an effective index which enables you to evaluate the degree of

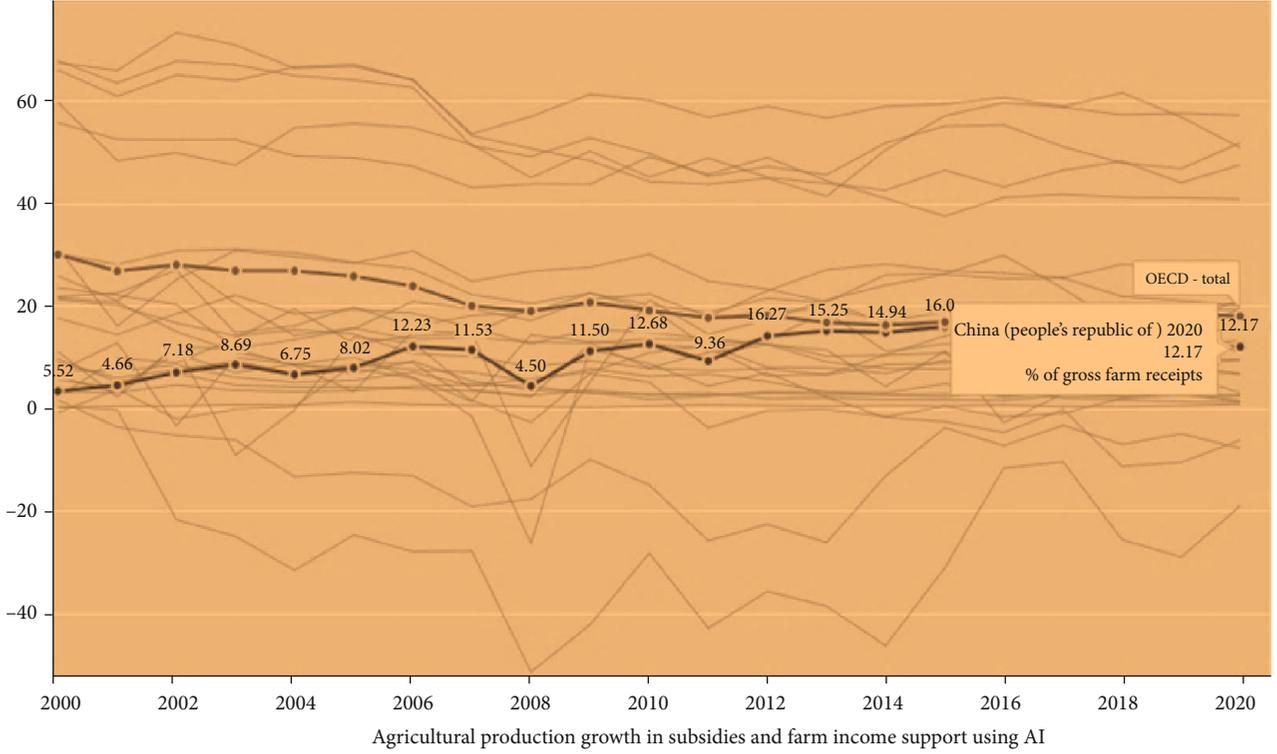


FIGURE 4: Analysis for the agricultural production growth in subsidies and farm income support using artificial intelligence.

TABLE 3: Subsidy spending as a percentage of farm income the agricultural production growth in various counties subsidies and farm income support using artificial intelligence.

For 2017/18	In 2006/7 prices (Yuan)
Subsidy of input for every hectare	9750
Subsidy to funding for every hectare	2250
Overall subsidy earnings	998000
Earnings for every hectare for farm cultivators	5576
Income from subsidies/farm earnings	35%

conformance of a town's production growth to the goal values which is performed with

$$\varnothing(D_1, D_2, \dots, D_j) = \sum_{j=1}^J \lambda_j \cdot D_j^O(k^1, k^2, \dots, k^M). \quad (11)$$

Equation (12) is being used to estimate its correlating density equation using its  $H(k)$  parameter estimation technique.

$$H(k) = \sum_{n=-\infty}^{+\infty} h(n^g) g^{jkn}. \quad (12)$$

An alternate solution description of  $h$  spatial frequency analysis is provided

$$H(k) = \lim_{x \rightarrow \infty} F\left(\frac{1}{X} \mid \sum_{x=1}^x n(n^2) g^{jkn}\right)^2. \quad (13)$$

There are two types of visual activities:  $F$  teaching that has been skipped and network delay. Visual bouncing appears to be the  $x, X$  process of moving one's gaze from one point in time to another, which primarily  $n, g$  represents learning focus, beginning to learn efficiency, and developmental delay. It is also examined in terms of frequency, circumstances, and so on. Using neural network recognition is a quantifiable way to determine the relationship between two or more independent variables represent for the following:

$$F(N) = \frac{\sum_i^x N_i^2}{x}, N(N_1, N_2, \dots, N_i) \text{ and } i = 1, 2, 3, \dots, x. \quad (14)$$

The experimental measured variables for parameters  $N$  and  $M$  are shown as  $N(N_1, N_2, \dots, N_i)$  and  $i = 1, 2, 3, \dots, x$  and  $M(M_1, M_2, \dots, M_i)$  and  $i = 1, 2, 3, \dots, x$ , respectively. For the estimation of data sets, the following is used:

$$F(M) = \frac{\sum_i^x M_i^2}{x} + \int M(M_1, M_2, \dots, M_i) \text{ and } i = 1, 2, 3, \dots, x. \quad (15)$$

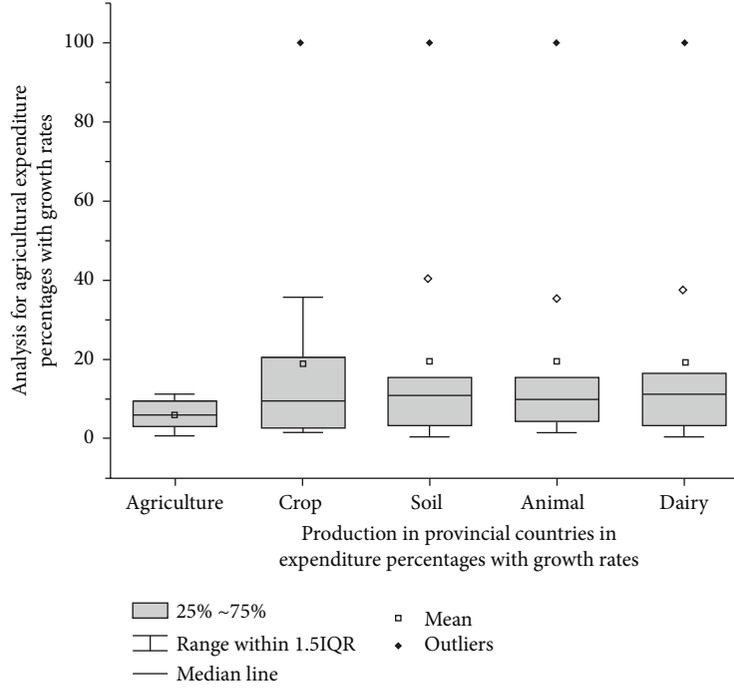


FIGURE 5: To increase agricultural production in provincial countries in expenditure percentages with growth rates for different agricultural operations.

The correlations are calculated using

$$\text{Cor}(N, M) = \sum \frac{\sum_i (N_i^2 - F(N))(M_i^2 - F(M))}{x} + M(M_1, M_2, \dots, M_i). \quad (16)$$

$H$  is a correlational design is determined using

$$H_{n,m} = \sum \frac{\sum_i (N_i^2 + F(N))(M_i^2 + F(M))}{x} + \frac{\sum_i M_i^2}{x}. \quad (17)$$

The best  $X_{GH}/(X_{GH} - X_{FH})$  accuracy is calculated as the GH proportion of a quantity of classified instances measurement techniques to the  $F(M)$  and  $F(N)$  accurately guessed measurements, as shown in

$$\text{GH} = \sum_{i=1}^x \frac{X_{GH}}{X_{GH} - X_{FH}} + \sum_i (N_i^2 + F(N))(M_i^2 + F(M)). \quad (18)$$

### 3. Results and Discussion

The quality of funds support  $A_h^m$  given to enterprise  $m$  in terms of rule  $S_H$  is measured by the amount of its most recent financial statement performance indicators. Equation (2) is retrieved from Figure 2: Two major concerns have arisen as a result of the increased use of farm subsidies as a fundamental component of agricultural production policies (among others). First, the size of the subsidies should be reduced. While the cost of support programmers is a source

of debate in rich countries as well, it is understandably more pressing in poor countries, where government spending is being squeezed by several under-funded commitments.

Subsidies in particular must be avoided by policymakers to avoid crowding out agricultural investments while also delaying structural change processes. The exchange was between short-term and long-term goals. Subsidies have reduced the relative cost of production in comparison to other fertilizers. As a result, fertilizer application is heavily skewed in favor of fertilizer, disrupting soil nutrient equilibrium. The agricultural field necessitates a significant amount of hard work and manpower to finish the work, as well as a significant amount of maintenance and service. In such case, as the need for labor grows, so will the availability of manpower. This study discusses a few agricultural strategies that work under the concept of artificial intelligence in order to reduce human participation while also completing the work faster. Creating a link between AI and the fielding region is a difficult undertaking since crop growth in the field requires a large number of trained eyes. An approximate annual increase in agricultural production in the provincial countries is given in Table 1.

Subsidies are split evenly between the federal and state governments in Figure 2. In which  $\pi^m(\cdot)$  is the business's income,  $k^m = k_1^m, \dots, k_n^m$  is the number of production performance indicators (varying models), and  $m \times n$  is the principle for changing the value of indicator  $n$  for the organization  $m$  based on this to retrieve Figure 3. The majority of expenses associated with loan forgiveness are covered by state government subsidies. Without loan approvals, the entire subsidy budget is nearly evenly divided between

TABLE 4: Result analysis to increase agricultural production in provincial countries in expenditure percentages with growth rates for different agricultural operations.

	Annual growth level (2000–2020)			
	LIS	MIS	HIS	ALL
Agriculture	100	100	100	100
Crop farming	37.99	46.60	39.64	38.56
Soil as well as water protection	6.00	4.65	8.24	6.67
Animal farming	12.57	12.90	18.22	23.56
Dairy growth	3.32	4.75	5.30	4.45
Fisheries	3.90	4.23	5.21	4.56
Forestry and environment	24.43	18.23	18.67	19.35
Food, packing, and warehousing	18.06	16.43	9.85	18.90
Agricultural R&D Learning	7.49	7.34	9.87	8.93
Cooperation	9.97	13.34	12.66	16.23
Others	2.67	1.45	2.89	1.96

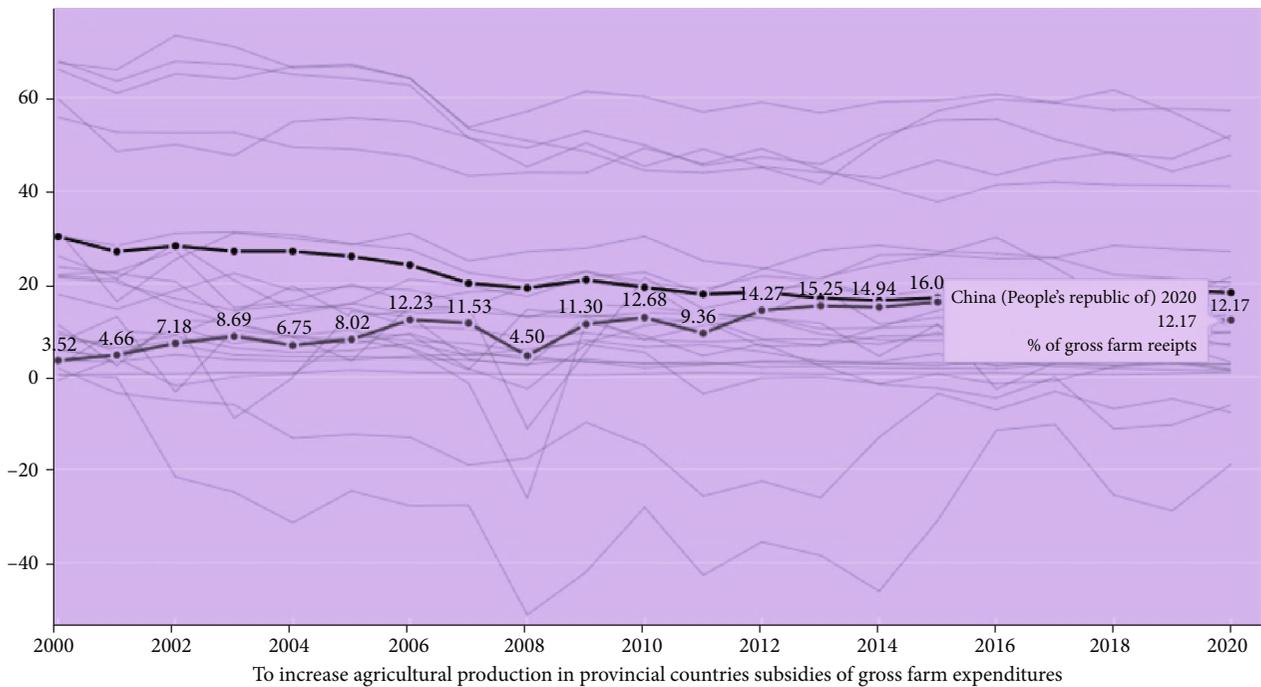


FIGURE 6: To increase agricultural production in provincial countries' subsidies of gross farm expenditures using AI with wireless network.

the center and the states. The most important central subsidy is the fertilizer subsidy, while the electricity subsidy accounts for the majority of state spending. The agricultural production growth in various countries is considered for evaluation and the results are tabulated in Table 2.

The subsidy represent the application whereby each  $D_j^t$  visual displays falls inside the acceptable ranges  $T_j$  are chosen for further evaluation  $H'$ : denotes a set of integers that must be evaluated separately in such rules and is described in Figure 4. As a result, and despite the fact that government farm subsidy spending is a significant component of farm income, even a large increase in subsidies will

have (a) limited effects on farm anguish because our farmers own small areas of land and (b) only a minor impact on the generally reported gap because the gap is far too large. Subsidies are thus too significant to reduce farm incomes, but they do not represent viable future directions for sustainable increases in farm incomes. The primary drivers of rapid income growth remain the country's development tasks. The percentage of income in various sectors is given in Table 3.

Despite recent increases, government investment in agriculture and irrigation (excluding flood management) remains clearly low in the LIS (see Figure 5). The visual activities are as follows:  $F$  teaching that has been skipped and network delay.

TABLE 5: Result analysis for to increase agricultural production in provincial countries' subsidies of gross farm expenditures using AI with wireless network.

Agriculture production countries subsidy	Procedure support (PSE)	Overall accuracy of gross farm (%)
2000	4.53	
2002	8.15	
2004	7.26	
2006	14.33	
2008	5.56	
2010	16.28	20.17
2012	15.47	
2014	17.64	
2016	17.76	
2018	16.67	
2020	16.37	

Visual bouncing appears to be the  $x, X$  process of moving one's gaze from one point in time to another, which primarily  $n, g$  represents learning focus, beginning to learn efficiency. Although the proportion of LISs' production growth spending in GSDP has remained high, at around 76% of the corresponding state level, governments have prioritized spending in urban areas over rural areas. Agriculture spending increased at a 9.9% rate across states in 2020, with MIS spending increasing at a slightly higher 13.6% rate.

Low-income countries are known as LIS, middle-income countries are known as MIS, and high-income countries are known as HIS. The annual growth of these population categories is tabulated in Table 4.

The expenses became so considerable that developed countries devised a two-pronged policy response to the stockpiling problem. The best  $X_{GH}/(X_{GH} - X_{FH})$  accuracy is calculated as the GH proportion of a quantity of classified instances measurement techniques to the  $F(M)$  and  $F(N)$  accurately guessed measurements, as shown in Equation (18) to retrieve in Figure 6.

Nonexcess procurement options, such as shortfall refunds and cash income transfers, continue to be prioritized by policies. Shortage payments, on the other hand, encourage farmers to produce more, and the problem of surplus supply (as a result of government support) will not go away. The agricultural growth from the year 2000 to 2020 is given in Table 5.

#### 4. Conclusions

Teachers in various institutions must discover new approaches to connect employers' current preconditions for selling agricultural output and occupational realization in order to best serve the needs of provincial countries' transformation while also promoting agricultural production growth. In this context, multimedia was used in a prospective study to help educators achieve their educational goal of creating graduates who are truly qualified for social demands. We investigate how multimedia networks might help farmers

obtain job knowledge and improve their agricultural production abilities, computer experience, effective communication skills, and cooperation. Additionally, the use of audiovisual networks in classroom training can lead to increased internships, improved teaching situations, and longer gross teaching hours, all of which could lead to better academic outcomes. The study used agricultural subsidies for enhancing intelligent design of agricultural production through wireless networks. The results proved that the procedure support has increased for five years. In future study, it is highly recommended to analyze the impact of deep learning technology in surplus agricultural production.

#### Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

#### Conflicts of Interest

The authors declare no conflicts of interest.

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