



Review article

Modern agriculture and challenges

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Abstract

In this review, it was tried to find out the challenges faced by modern agriculture and the relationship between related industries and enterprises. With the infection control of the Covid-19 pandemic, the prevention and treatment of natural disasters and the healthy development of human society have become common concerns. The focus is on human health and the importance of the agricultural and industrial sectors, including food health, food security, and economic development. As the demand is also updating, in the development process of these three basic problems, we should not only review the previous planning, overcome and prevent the existing problems but also do more research and exploration with the new planning. These three topics are important issues that need to be dealt with urgently in a person's or a country's or international relations. Scientists strive to help farmers understand how modern agriculture is and must be a part of the solution for these challenges.

Keywords: *Challenges; development; industry; modern agriculture; trade*

1. Introduction

According to the final report of the Food and Agriculture Organization of the United Nations (FAO) in 2020, although the Covid-19 pandemic has different degrees of impact in all food sectors, the agricultural and food sectors have advantages in this respect, so other sectors are not as good as others in resisting the epidemic. The report predicts that the production and market trends of grain, oil crops, meat, dairy products, fish, and sugar will become the world's largest trade grain commodity in 2020-2021. The situation of cereal supply and demand is good. FAO's early forecast shows that global grain production in 2020 will exceed 2.6% of the previous year. It is estimated that world cereal trade volume will reach 433 million tons in 2020/21, an increase of 2.2% (9.4 million tons) compared with that in 2019/20, and will reach a new historical high due to the expected expansion of all major cereal trade (FAO, 2020a).

In order to meet the increasing demand up to 2050, it is estimated that global agricultural production will need to increase by 70% (Bruinsma, 2009). Improving rural poverty and

community farms in urban suburbs is one of the measures to achieve food security in developing countries. In order to promote global food security, low-income countries need to increase their quantity and quality of food production in order to reduce their vulnerability. In many food-dependent low-income countries around the world, especially in Africa, there are huge differences in production (FAO, 2011a).

Sustainable agricultural mechanization is a key strategy to achieve long-term growth of agricultural production in all aspects, including reducing the coolie of small-scale farmers, improving the timeliness of agricultural operations and improving the efficiency of input and use. In the long run, mechanization will contribute to the sustainable strengthening of production systems and the establishment of an agricultural sector more resilient to increasingly extreme and unpredictable climate events (FAO, 2017). Small farms are at the center of the strategy of food supply chain. Small-scale agriculture will continue to improve productivity and increase the local food supply. In this way, we can not only effectively reduce poverty, but also make a significant contribution to economic

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development. Around 75% of the world's people, most of them living in rural areas are still extremely poor, live with hunger and fear starvation. Small-scale producers and landless households, a large part of people's income directly depends on agriculture or is engaged in agriculture based activities and the rest are small business owners related to agriculture, such as processing, machinery, storage, seeds, feed or fertilizer. A large number of starving people in poor countries only depend on agriculture for a living, but for a long time, their input is seriously insufficient, which hinders the overall productivity of agriculture. Lack of investment also reduces farmers' ability to cope with price fluctuations and external shocks, including those related to weather and the economy. Climate change is affecting farmers' livelihoods and food security around the world. There are clear signs that there may be underinvestment, which will have a huge impact on poverty reduction. For example, in the World Bank 2008, the quantitative analysis of the effect of poverty reduction shows that the growth of agricultural GDP (gross domestic product) is faster than that of external GDP (World Bank, 2008). Sustainable production of healthy livestock with nutrition and food for everyone is crucial. However, there is no specialized organization that can deal with the risk of specific diseases on time, and prevent, control and eliminate livestock diseases. Therefore, it is not only necessary to be on time in view of the seriousness of disease problems and problems in medicine, public health, veterinary medicine, entomology and environment, but also need to carry out firm international coordination and cooperation to develop and eliminate livestock diseases within the framework of the concept of "one health" Implementing the global strategy for collective health protection (FAO, 2011b). It mainly includes locusts, armyworms and fruit flies, which pose a major threat to agricultural and animal husbandry resources and livelihoods, as well as wheat, coffee and soybean rust, banana fusarium wilt, cassava and corn virus diseases, which spread rapidly, threatening neighboring countries, regions and continents. This disease seriously affects nearly 70 countries in the world, which is highly infectious. More than 80% of sheep and goats and more than 330 million people live in the world's poorest areas, causing losses of US \$1.5 billion to US \$2 billion per year, many of whom rely on small ruminants for their livelihood (FAO and OIE, 2015).

As a labor-intensive sector, agriculture can certainly absorb underutilized labor. For example, some farmers and rural workers have no land or too little income. In addition, agricultural growth has led to a decline in food prices, a doubling of the role of the local economy, and an increase in rural wages (Schmidhuber and Bruinsma, 2011). Therefore, the necessary condition of food security is not only to make full use of the existing natural resources, but also to invest in small farmers' agriculture and promote the development of a fair economy.

FAO published a paper entitled "how to feed the world by 2050" at an expert meeting in Rome in 2009, including the main conclusions of the meeting (FAO, 2016). A large part of the world's agricultural production is grain production. By 2050, according to the data of FAO, the world's total grain output is expected to reach 3 billion tons (Alexandratos and Bruinsma, 2012). It is estimated that global meat production will reach 429 million tons in 2001 and 470 million tons in 2050, which is more than twice the increase (Scollan et al., 2010).

The commercial and nutritional quality of fruits and vegetables depends on a range of characteristics, attributes and characteristics (Schroder, 2003). The identification of commercial quality standards includes origin, freshness,

cleanliness, appearance, hardness, consistency, no damage, color, no disease, aroma, texture, size and shape (UNECE, 2007). Nutritional quality, essential nutrients such as carbohydrates, amino acids and fatty acids are related to bioactive compounds such as phytosterols, dietary fiber, vitamins, carotenoids, phenolic acids, glucosinolates and flavonoids. In the process of delivery, quality will be affected by various activities in the supply chain. For example, the sales quality of fresh vegetables decreased due to mechanical damage caused by handling and transportation vibration during transportation. The next doubling of food production will be achieved through land reduction per capita and water shortage. In order to meet the needs of the future population, the increase of food production is faced with some challenges, such as the increase of high protein food sources (Singh-Ackbarali and Maharaj, 2017). In food applications, it is most important to be able to quickly and correctly detect harmful and unhealthy (off-label) animal and plant substances in processed food (Yancy et al., 2008). The main goal of all food safety organizations is to ensure the food safety of consumers in an all-round way (Cutarelli et al., 2014).

All in all, in human history, the long-term expansion of population has been limited by food supply and disease constraints (Diamond, 1997). The domestication of animals and plants has further promoted the development of human society, caused a large number of people, and increased the risk of disasters and major disease outbreaks (pandemic). The recent global pandemic of Covid-19 is caused by the emergence of a disease caused by severe acute respiratory syndrome coronavirus 2 (Sars-Cov-2). Moreover, it has caused great interference and losses to economic activities and severely restricted international cooperation, exchanges and exchanges. The pandemic exacerbates new challenges to food security posed by climate change and major conflicts, both of which are major factors contributing to overall food insecurity. Plant scientists need to identify investment in innovation and change measures to deal with the pandemic. Ensuring supply through the use of modernization and automation at all stages of the food production system will exacerbate concerns and challenges about labor shortages and food safety. Responding to transport and trade disruptions to support food production close to the point of consumption may facilitate accelerated efforts to develop protective crops. Both trends will increase the demand for new crop varieties to meet the growing demand of consumers, better promote more research work, including successful prevention and treatment of epidemics, and accelerate the application of emerging plant breeding technologies in these rapidly developing modern agricultural environments (Henry, 2019; Genc, 2020; Uras, 2021).

Global value chain (GVS) refers to the sharing of international production, a phenomenon that divides production into activities and tasks in different countries. Global value chain accounts for half of the total trade volume, which promotes the surge of international trade and creates unprecedented economic integration: some developing countries are becoming net importing countries and growing constantly: Indonesia, Nigeria, Algeria, Pakistan, Iran and the Republic of Korea are such cases, which make up for the lack of net import growth of developed countries. All over the world, governments are actively and openly intervening in the economy to promote innovation, create new technologies and cultivate cutting-edge industries. These interventions can have a positive or negative impact, especially in today's highly interconnected global economy. On the one

hand, they can expand knowledge, increase productivity and disseminate basic tools for global growth and development. But on the other hand, they may also distort trade, transfer investment, benefit one economy and harm the interests of other economies. More than ever, international cooperation and rules are needed to ensure that governments' new focus on innovation and technology policies can maximize positive spillover effects, minimize negative spillover effects, and ensure that competition for technological leadership does not evolve into a struggle for technological dominance (WTO, 2020a). The global financial crisis in 2008 also brought a serious threat, adding pressure to the trade led growth model. New technology can shorten the distance between production and consumers and reduce the demand for labor. With the development of industrial and agricultural trade and technological change, global value chain can continue to promote growth. The premise is that developing countries implement more in-depth reform and innovation, and promote participation in global value chains. Industrial countries pursue open and predictable policies, and they need to strengthen and resume multilateral cooperation. With the reduction of trade and communication costs, the development of new products and the improvement of productivity, developing countries should accelerate the reform of trade and investment and improve the level of connectivity. It is conducive to promoting the development of global value chain and making it a sustainable and inclusive development force. (World Bank, 2020).

2. Agriculture and challenges

With the rapid development of cities, the urbanization of the world has entered unprecedented progress, 55% of the world's population is urban, and the border population has been growing by about 7.5 billion since the early 1960s (FAO et al., 2018). In Asia and Africa, urban population growth has reached 90% (UN DESA, 2018). By 2050, 2.5 billion people are expected to live in urban areas. Unprecedented urban development is now taking place all over the world, and the urban population accounts for more than half of the global population. Access to adequate, safe, nutritious and cash regulated properties in urban areas poses specific food security and nutrition challenges. The actual distance between grain producing areas and consumers, the lack of transport options, the fluctuation of grain prices, the concentration of power in global grain trade, the impact of climate, and the failure of the safety net of low-income urban residents, especially in times of crisis, often limit the access to food (FAO, 2019). In order to meet the growing world population, the production of adequate food has become the primary and sustained challenge for agriculture all over the world. The share of agriculture in total production and employment is declining at different rates, and the challenges are different in different regions. The second challenge facing global agriculture is to develop new technologies, policies and institutions that will help to realize the full potential of agriculture as an engine of growth. Although agricultural investment and technological innovation are increasing productivity, it is disconcertingly low that output growth has slowed down. In order to reduce the loss and waste of grain in agricultural output, the goal of increasing production can be achieved. However, the degradation of natural resources, the loss of biodiversity and the spread of plant and animal diseases and pests across the border have hindered the necessary acceleration of productivity growth, and some of them have

become resistant to antimicrobial agents. Developing a new set of technologies, incentives and policies to encourage small-scale farmers to attach importance to long-term management of natural resources, and improving the productivity and profitability of small-scale farmers are closely related to improving the management of natural resources in developing countries (FAO, 2017). Based on indigenous and traditional knowledge, the establishment of agroecology, agroforestry, climate intelligent agriculture and protective agriculture is a process of "holistic" transformation. To solve the problem of climate change and the aggravation of natural disasters affects all ecosystems and all aspects of human life, so it needs to be realized through the progress of new technologies, coupled with the sharp reduction of economic scope and the use of agricultural fossil fuels. It is also necessary to strengthen international exchanges and cooperation to comprehensively prevent emerging cross-border agricultural and food system threats, such as pests and diseases. Strengthen the innovation system based on the conservation of natural resources to improve productivity. However, there is a need to respond to growing demand, climate and soil changes, mainly the risk and pressure of human interference with agricultural production systems (FAO, 2019).

Floods affect human survival, property and economic activities in many ways. There has been a lot of research on how to prevent, mitigate, manage and deal with the clean-up and recovery phases. Although the flood frequency is not high and the occurrence time is short, the damage to property and houses can cause a serious economic burden. By promoting and supporting integrated watershed and plain management while focusing on the establishment of good drainage systems and forest protection, the capacity and occurrence of catastrophic floods can also be fully mitigated and prevented (Murnane, 2004). Climate change and drought affect all regions of the world. It is not only a climatic feature, but also a temporary condition caused by water shortage, which can occur under almost any climatic condition. The definition of drought occurrence occurs when the rainfall is lower than the long-term average rainfall of a certain place in theory, and the location is very important (FAO, 2017; 2019).

From 2010 to 2014, different parts of the world were hit by drought, and agriculture, industry and commerce posed great challenges. Climate change may lead to more frequent and severe droughts. In dry land, semi-arid areas, which usually have more population and more economic and social activities, are more affected by drought. Based on the analysis of historical drought trends, there are significant regional differences in drought and its impact (Field and Barros, 2014). The International Food and Agriculture Organization (FAO) said that compared with the global food price crisis from 2007 to 2008, the global food production prospect is optimistic and the food situation is better, which has become a new problem of food access. The price is low, the inventory is high, there are many import and export countries, and the trade base is broad. Due to the Covid-19 incident, the economic growth rate dropped sharply, which restricted people's ability to obtain adequate and nutritious food. Policymakers should be prepared for similar global crises and gain more experience and insight ahead of time. At present, the Covid-19 pandemic has also led to the loss of researchers, the closure of many research laboratories, the cancellation of many global research conferences and the reduction of direct contact between researchers, which has partially destroyed the existing agricultural and food research system (Capell et al., 2020; Tokel, 2021).

In different regions and countries, there are great differences in planting systems and agricultural technology use. Under the premise of international exchanges, new agricultural technologies and reforms have been widely spread all over the world. The socio-economic, agronomic and technical challenges faced by agricultural measures are due to the limited cost and lack of skills, which are known as socio-economic barriers. There are many technical barriers, including machinery, sensors, GPS, software and remote sensing. However, the adoption of precision agriculture and other measures will gradually eliminate the obstacles encountered, which will play an important role in the future agricultural system (Robert, 2002). However, in recent years, the introduction of high-tech technologies, such as automatic fertilizing devices, autonomous agricultural machinery and a series of computer software for managing various production systems, has generally taken effect everywhere (Gebbers and Adamchuk, 2010). Of course, precision agriculture is a promising form of agriculture (Mulla and Khosla, 2015). These advances in agricultural modernization have also brought many benefits to farmers, including increased productivity and the resulting profitability, farm quality, clean environment, food safety and sustainability, and households and consumers who may be affected globally. At present, the main challenges are to take measures to identify new approaches to crop diseases and pests, reduce pesticides and agricultural practices and activities harmful to humans and the environment, and redesign agricultural management models in the information age (Nyaga et al., 2021).

At that time, more than 840 million people are suffering from malnutrition, of which Africa and South Asia account for a high proportion. Around the world, most of the 1.3 billion people who are engaged in agriculture live on less than \$1 a day. The worry is that the rate of degradation of natural resources is accelerating (McCalla, 2001). Although it is too early to assess the full impact of the blockade and other containment measures, the report estimates that at least 83 million people, and possibly as many as 132 million people, will starve in 2020 due to the recession triggered by the Covid-19 (WHO, 2020). The map of hunger 2020 depicts the prevalence of malnutrition in all countries in 2017-2019 - if current trends continue, by 2030, the number of starving people will reach 840 million (WFP, 2020). "Green Bay Crops" are mainly common garden vegetables, as well as potatoes, some oats and spring wheat. People on the grassland grow many small grains, such as wheat, barley, oats, potatoes and onions. Grain was one of the most important commodities in the trade between the eastern Mediterranean and western city-states in the first half of the 14th century and the 15th century. Food is vital to survival and an important part of the trade. International trade was the focus of the early construction of the Ottoman Empire. The trade relationship between European merchants and Muslim merchants is discussed from the development of the Ottoman Empire in 1300 to Constantinople in 1453. The economic development of the early Ottoman countries and the expansion of Ottoman territory provide a rare insight into their economic aspirations and eventual integration into the Mediterranean basin economy, and clarify the close relationship between Muslims, agriculture and trade (Fleet, 1999). White settlers in fur trading villages grow gardens in the hope of feeding their farmers and trading any additional agricultural products (Apps, 2015).

In 1994, the first genetically modified food approved for marketing was yellow tomato, which successfully inserted an antisense gene delaying ripening and had a longer shelf life. By

2000, transgenic crops such as potato, Bt corn, Bt cotton, glyphosate-tolerant soybean and golden rice have been completed (James, 2011; Tokel et al., 2021). Advances in biotechnology have created contradictions on a wider range of social, ethical, religious and economic issues. Many environmental organizations and consumers are strongly concerned about the direct and long-term effects of genetically modified organisms on human health. At the same time, environmental risks, such as the reduction of biodiversity, the spread of superbacteria, gene leakage and agricultural sustainability of genetically modified crops, were emphasized (RAFI, 2000). The area of genetically modified crops in the world increased from 1.7 million hectares in 1996 to 52.6 million hectares in 2001. In 2001, the United States (35.7 million hectares), Argentina (11.8 million hectares), Canada (3.2 million hectares) and China (1.5 million hectares) planted 99%. Transgenic companies began to invest a lot of money in the research and development of transgenic crops and determined to expand the transgenic market. Biotech crops have been commercialized for 22 years. In 2018, 17 million farmers in 26 countries planted 191.7 million hectares of biotech crops. Compared with 1996, the planting area of 191.7 million hectares in 2018 increased by about 113 times. Therefore, the fastest crop technology in modern agricultural history is considered to be Biotechnology Crops (ISAAA, 2018).

Farm classification is the process of classifying each census farm according to the main production types. This is achieved by investigating the potential revenue from crop and livestock inventories to estimate and identify the products or product groups that account for the majority of the estimated revenue. Total agricultural revenue includes all agricultural sales, programs and refunds, sales committee payments, tax rebates for goods and services, customs revenue, cooperative dividends, and agricultural product revenue. The renewal and innovation of agriculture promote the development of new markets and the opportunities brought by new technologies (Planscape, 2003). The innovative approach to food supply is an iterative cycle, including the design and construction of target genotypes (using plant biotechnology equipped with advanced genomics and gene editing) and the production environment (the most cost-effective engineering environment). Sustainable and reliable modern agricultural production can be achieved regardless of the recurrence of challenges such as climate change or disasters such as pandemic (Pouvreau et al., 2018).

Although economic difficulties lead to low population growth rates in developed countries, the adverse impact of Covid-19 on the global economy may also lead to new risks of accelerated population growth, thus greatly increasing food insecurity (Genc, 2020). Poverty is also a major factor leading to rapid population growth in developing countries (Van Bavel, 2013).

The environmental performance index 2020 ranks 24 performance indicators of 10 problem categories in 180 countries. The sustainable development of agricultural industrialization in ecological countries provides new employment opportunities for researchers, scientists, biotechnology experts, veterinarians, farmworkers and development technicians. At present, the introduction of genetically modified organisms (GMOs) has attracted some attention, and the planting area of these organisms is expanding every year (Arvas and Kaya, 2019). The latest technological innovations in agronomy, transgenic plants, chemical pesticides and chemical fertilizers have accelerated synchronous

development and improved the quality and yield. Due to the increase of human population and food demand, genetically engineered plants and their products are obtained by using recombinant DNA technology, which is the result of technological development in the last 25 years (Arvas and Kocacaliskan, 2020).

3. Agriculture and industry

In recent decades, agriculture is characterized by a large number of purchasing inputs, which inevitably depends on the industrial sector. Industrial benefits of agricultural related enterprises have increased significantly, especially due to investment opportunities in post-harvest processing of crops, such as food processing and exports (Satterthwaite et al., 2010). The impact of agriculture on production in the industrial sector has increased over time. Before the 1980s, the real GDP of the industrial sector was more flexible than that of the agricultural sector, and the relative importance of agriculture and industry was higher. Agriculture is an integral part of the process of industrial development, and the mutual promotion and development of industry and agriculture is a complete process. Agriculture contributes a lot to the whole industry, especially to the economy. For example, the role of industry in providing inputs to modern agriculture, especially after the green revolution, and in expanding the demand for wage products, need hardly be mentioned (Satyasai et al., 1999).

The meat industry accounts for a high proportion of the world's food industry in many countries, which plays an important role in the global economy. The poultry (13.6 kg/year) were the largest per capita meat consumption in the world (Silva et al., 2016; Zocca et al., 2018). At the same time of consumer demand, refrigeration system is the key to obtain product stability and sensory characteristics, and prevent the development and change of meat ingredients, bacteria and microorganisms in the meat industry (Savell et al., 2005). Slaughterhouses (European Commission, 2003) and meat processing industries (Ramirez et al., 2006; Alcázar-Ortega et al., 2012) consume 60% - 90% and 40% - 50% of cooling system power, respectively. Two-thirds of the total energy cost of the meat processing industry is equivalent to the cost of electricity (HTC, 2009). According to the FAO meat price index, the average international meat price in 2019 is 175.7, which is 9.4 points (5.6%) higher than that in 2018 and 2.3% lower than that in 2018. Production of other meats, especially poultry, is on the rise, while import demand is surging. Increasing meat production and exports are the response measures of many meat-producing countries, but the total global exports are still far below the level needed to fill the deficit, leading to the rising trend of international meat prices (FAO, 2020b).

Society, manufacturing and food processing industries are facing technological and economic changes. Therefore, the whole food supply chain has been greatly affected. In order to meet the needs of consumers' healthy lifestyles, enterprises attach great importance to food. The necessity of survival in the fierce competition is to introduce market innovation into the food industry to further update, so large-scale research and exchanges were held. Many achievements have been made in this regard. The protection of agriculture is guaranteed by the international trade system under the GATT. In order to achieve the goal that a country's agriculture will continue to be the top priority sector of all countries and people, which can promote the creation of healthy societies, meet food needs and provide

nutritional security. Agriculture not only contributes a lot to GDP, but also provides food, raw materials and fiber for industry (Galanakis, 2018).

People's food is based on products such as milk, cheese and yogurt, which are widely consumed all over the world. Milk is the world's largest consumer, but the milk of sheep, camel, buffalo, goat and other mammals is also being consumed. In November 2020, the United Nations Food and Agriculture Organization (FAO) dairy price index continued the upward trend in recent months, with an average of 105.3 points, up 0.9 points (0.9%) on a month on month basis, approaching the highest point in 18 months. The recent rise is mainly due to the steady growth of global import demand, which is due to the rising prices of butter and cheese, as well as the surge of retail sales in Europe. The milk market is disturbed by Covid-19. On the contrary, it is expected that the global milk production will increase by 1.4% year-on-year to 860 million tons in 2020 (FAO, 2020c). Dairy products are important sources of protein and calcium, and play an important role in nutritional diet. Dairy industry has become one of the important sub industries of animal husbandry (Zocca et al., 2018). Many studies emphasize that dairy consumption in Europe, the United States and other parts of the world is the rate of energy consumption. The cheese manufacturing industry, for example, can be used to evaluate and measure the energy performance of the food industry (Nunes et al., 2014; 2015; 2016). The consumption of dairy products in China is on the contrary, and the per capita consumption of dairy products is lower in areas with higher population density (Silva et al., 2016). The new trend of the times will become an industry-led information age. To provide a series of safe, healthy, nutritious, affordable and sustainable food for consumers and society is the main goal of agricultural products processing industry under the premise of introducing new technology and maintaining competitiveness. On the whole, a processing plant has the characteristics of limited resource utilization and serious corruption, so it is called agricultural products processing industry, so its use should be as efficient as possible. In general, due to the importance of agricultural products in the human food chain, the industry has changed agricultural products, including not only human food, but also animal feed. Due to the positioning between agriculture and consumer market, the agricultural products industry has its independent characteristics, and the construction and development of sensitive raw material behavior and market organization (Zocca et al., 2018).

4. Agricultural trade

Agricultural trade has been covered by the general agreement on trade and tariffs (GATT), signed in 1946. In the bilateral aid, the share of production sectors including agriculture, mining, industry, tourism and trade policy continued to increase. (WTO, 2000). GATT and World Trade Organization (WTO) have promoted trade and innovation by reducing tariffs many times, combining discipline with basic principles, and reserving policy space to deal with important social issues. WTO disciplines will continue to promote trade and innovation in the digital world. In addition, the multilateral trading system provides certainty, promotes cooperation, and is flexible in dealing with new problems (WTO, 2020b).

In the world agricultural development report, the main driving forces for growth in developing countries are divided into three categories, including agricultural economy

(agriculture accounts for about 30% of GDP), transitional economy (agriculture accounts for about 19% of GDP) and urbanization economy (agriculture accounts for about 7% of GDP). In the transition and urbanization economy, industry and service industry are considered as the main sources of economic growth. Only in the first agricultural based economies, mainly in Africa, should focus on agriculture as the main driver of growth. In fact, agricultural and non-agricultural sectors are closely related in terms of inter-sectoral demand (including intermediate input). Therefore, the focus of investment may need to take into account the indirect role of the agricultural sector in stimulating rural income growth (WTO, 2008). More and more attention has been paid to the distribution of trade income, so the dominant paradigm of international trade has been under considerable pressure (Viju-Miljusevic, 2019).

Agricultural trade is of great significance to the development of national economy, especially to employment and food security. It is controversial to bring agriculture into the rules of international trade. The export of agricultural products is very important, and the import is equally important to the food security of consumers in net food importing countries. Each country has the right to produce enough food, protect vulnerable farmers, and develop unique agricultural policies. So far, the approach taken by the international trading system has been to enhance the flexibility of multilateral and preferential trade agreements. Market access, domestic support and export subsidies are the three major agricultural agreements. Export subsidies will increase exports, raise domestic prices and reduce foreign prices. A price wedge equal to the subsidy value will be formed between the foreign price and the domestic price of the product. These measures need to follow standards to limit their impact on trade and production (Peters et al., 2013).

Agricultural capital refers to the value of farmland, including agricultural machinery and equipment, buildings, livestock and poultry for agricultural operation. However, it does not include the value of existing agricultural inputs such as fertilizers, crops or seeds in the field or stored. Farmland includes all land owned as part of its business activities, including hay grazing or pasture, swamps, buildings and barns, summer fallow, woodland and arable land. The person responsible for the day-to-day management and decision-making of a farm or agricultural operation is referred to as "farm operator", and each farm reports up to three farm operators (Cook, 2018).

A major challenge for low-income countries is to design and expand alternatives to social protection for workers in the informal economy (Jansen and Lee, 2007). Formal employment is more important in middle-income countries, and there is often more scope for social protection for workers adversely affected by trade and related economic reforms. The time required to import and export goods is an important trade barrier. Trade liberalization provides business opportunities for companies that are able to export, and offers consumers access to cheaper and different goods through imports. However, these imports may compete with local production, and the local producers concerned may be under new competitive pressure. New export opportunities and increased competition from imports will lead to the expansion of some activities and the reduction of others (WTO, 2008).

In developing countries, the supply of exports and employment opportunities has also accelerated the pressure on agricultural trade. Agricultural trade liberalization alone cannot create an employment miracle. Similarly, agricultural trade

liberalization should not be expected to have a significant negative impact on employment, but these successful strategies are based on agricultural trade. Many agricultural workers need to adjust these plans more reasonably to reduce their social security burden. Trade liberalization is to eliminate or reduce the restrictions or barriers to tariffs (such as tariffs and surcharges) and non-tariff barriers (such as license rules and quotas) on the free exchange of goods between countries. Trade liberalization can lead some developing countries to further increase the specialization of agricultural production. The migration from rural to urban is the concentrated embodiment of a country's population. Measures to promote urban integration may have a significant impact because trade reforms trigger or exacerbate such migration. In order to promote food security for new urban residents, more information and facilities on housing or employment opportunities can be provided, or suburban agriculture can be supported, including planting crops and raising livestock around the suburbs. Although the poverty rate of rural workers is very high and it may cause great difficulties to move from one job to another or from one place to another, reducing this difficulty is a lofty goal and may help to improve economic efficiency (Cheong et al., 2013). The e-commerce and law reform program of the United Nations Conference on Trade and Development (UNCTAD) provides an opportunity for developing countries to conduct expert reviews of e-commerce legislation and to provide expert advice to policy-makers on effective e-commerce laws. The areas covered by the scheme include consumer protection, cybercrime, data protection and privacy, intellectual property and electronic signature (WTO, 2020b). Where does the food come from? If past trends continue, expanding trade will not be the answer. Since the reform of agricultural trade, the world grain output has more than doubled, and the world grain trade has also doubled. Therefore, the share of food consumption in world trade remains around 10%. This shows that 90% of the world's food production is consumed on average in the producing countries. If this trend continues, it is clear that most of the growth in food production must come from the production systems of countries where new populations live (McCalla, 2001).

Sustained agricultural investment will inevitably have positive side effects on the agricultural industry, as Z manufacturing (such as food and beverage) shows. The agricultural sector is likely to play a greater role in the global economic integration. In populous developing economies such as India and China, per capita income and food demand are also growing, indicating that the agricultural sector has considerable expansion potential. The agricultural sector has always been the foundation and component of the world economy and development. It plays a role in providing food and raw materials to the domestic market, absorbing domestic labor and capital, and generating export income. It also supports manufacturing and services. However, when formulating effective and up-to-date policies on agricultural trade and sector linkages, the impact of trade on agricultural value-added and the spillover effects of agriculture on the world economy and other sectors deserve further analysis. The conclusion is that policy-makers need to seriously consider new agricultural policy initiatives to bring the agricultural sector closer to other sectors such as tourism services (Gani and Scrimgeour, 2019). In fact, in many of the world's economies, the trade and agricultural sectors have been the main areas of research. If a country wants to be strong, it must rely on itself to develop an agricultural economy and ensure ecological and nutritional security.

5. Conclusion

In order to promote “modern agriculture” and overcome “challenges”, it is necessary to further strengthen agricultural scientific research. On the road of common development of agriculture, industry and commerce, we should first prevent and avoid food shortages, disasters and conflicts. Secondly, we need to find new methods of international trade competitiveness and obtain the growth of agricultural production level; at the same time, we need to realize sustainable development.

We should learn from the past experience that no matter how many problems there are, solutions should be given priority. The problems are not insurmountable but it uses modern agricultural methods to get through them. A comprehensive survey of the challenges facing today’s agriculture, such as Covid-19, population growth, changes in eating habits, destruction of seed resources, shortage of water resources, air pollution, climate change and changes in food prices, shows that it is the common responsibility of all countries to invest the most in solving these problems. In addition, floods and droughts continue to affect the growing season of crops, limiting water supply, increasing the growth of weeds, pests and fungi, and reducing crop yields.

With the simultaneous development of food security and industry and commerce, we need to completely change all social production and consumption patterns. To protect and strengthen the reserve of natural resources, maintain and improve the quality and efficiency of sustainable grain and modern agricultural production through the innovation and competitiveness of agricultural modernization system, is one of the main focuses of modern agricultural development policy. Although many studies emphasize the potential of traditional agriculture, the machinery and technical facilities in the agricultural sector, as well as the relationship between supply and demand, are changing rapidly.

Today, for example, genetically modified plants have reached a huge commercial scale. The technology of artificial meat is more and more popular. I hope this product can be launched as soon as possible. The greatest hope for meeting the challenge of sustainable agricultural development lies in the ongoing innovation process, which uses modern genes and information technology to improve agricultural productivity, while balancing the economic, health, environmental and social

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outcomes related to agriculture and food systems. Great changes are taking place in the face of agricultural modernization. The innovation practice of traditional industries is speeding up the improvement of new products. Especially in urban areas, people are more and more interested in innovative food and natural products. They are opening up new markets and opportunities.

Agriculture is one of the oldest commercial forms of industrialization. At the end of the 20th century, from the beginning of “The Green Industrial Revolution”, agricultural production based on cultivated land, planting plants and raising animals has become an important part of national economy in developing countries. Since then, agricultural industrialization has continued to grow, including the production, supply, sales and export of agricultural products. The industry has become an important industry in India, Africa and other ecological countries. Ecological country’s goods and services, laws, guidelines and policies are environmentally friendly, also known as eco-friendly, nature friendly, or green, which means that the practice is sustainable, reducing or minimizing the damage to the ecosystem and the environment. Being eco-friendly helps to save water, energy and other resources and prevent air, water and land pollution. Environmental performance index (EPI) is a method to measure a country’s policy environmental performance.

Human safety is directly proportional to food safety. As a human standard, it needs to be divided into material and spiritual supplements. The development of an economy is in direct proportion to the support of economic investment. The only barrier to economic integration is the existence of interest. The development of an agricultural economy is also the development of trade and industry.

If Covid-19 prevents low-income countries from getting rid of poverty and further promotes agricultural modernization, otherwise population growth may be higher than previously predicted, which will bring greater pressure on food security, trade and industry.

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