

# Green Development is Leading to an Increase in Agro-Quality and Efficiency

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## INTRODUCTION

In 2015, the MoA launched a campaign on grain yield growth and green development in Northeastern China, Northwestern and Southwestern China, and regions along the Yellow River, Huaihe River and Haihe River, as well as the middle and lower reaches of Yangtze River. The ministry developed a model featuring high output and high efficiency, resources conservation, and ecological environment protection in order to promote a stable production and an increase in grain output, and improve the quality and efficiency so as to achieve a 12<sup>th</sup> consecutive growth in grain output.

## MAJOR JOBS

The country focused on tackling major problems in green development model, and pushed forward related jobs. It strengthened guidance and services, and pushed forward all the jobs to carry on smoothly.

**1. Coordinate jobs and reinforce implementation** Each province took charge of one area. The development of green growth model relied on resources, cropping systems, and crops' structure, and assigned one leading province in five regions, referring to Northeastern China, regions along the Yellow River, Huaihe River, and Haihe River, and regions along the middle and lower reaches of the Yangtze River, as well as Northwestern and Southwestern regions. The ministry departments in these leading provinces coordinated jobs between other provinces in the region, and research and promotion institutions. One region confirmed one key development point. Considering the technical bottleneck that restraint grain output growth in the region, every region has confirmed one or two crops, with one or two planting models. The middle and lower reaches of the Yangtze River focused on the mechanization of rice and oilseed rape in the whole process, regions along the Yellow River, Huaihe River, and Haihe River focused on the high output of wheat and corn, and Northeastern China promoted a decrease in the use of pesticides in rice and corn, and the Northwestern and Southwestern China developed water conservation of corn and potatoes. All the regions coordinated their efforts and cooperated to tackle problems in order to make sure achievements were made.

**2. Make joint efforts to promote implementation** The country played a full role of both administration and scientific research, and called on all the sides to make joint efforts, in order to form a structure in which the government played a leading role, related departments cooperated, and research institutions took an active part. In Hebei, Hubei, and Sichuan, they organized famous experts to form technique guidance groups, and integrated scientific research, education, and promotion resources. They required every county to promote one scientific research institution, employ one leading expert and build a group to tackle problems.

As for the bottleneck problem of low level of reaping oilseed rape, two academicians Fu Tingdong and Guan Chunyun developed new technique models such as mechanization in the whole process of oilseed rape planting and machinery transplanting of seedling. Another academician Zhang Hongcheng took a leading role to develop the machine transplanting of rice pot seedling model featuring rich water and green growth. The MoA also called on the agricultural departments at community—level to exploit their advantages fully of its strong capabilities, broad service range, and close ties with production. Each demonstration area has one specific agriculture technical staff in charge in order to make sure services, materials and capitals could be provided to every farm household and increase the implementation rate of green growth model.

**3. Strengthen guidance and implementation** The country provided more financial support at country level in order to expand demonstration areas, improve subsidy standards, and promote the development of green growth model. Jiangsu Province improved the subsidies for wheat and rice demonstration areas from 160 000 yuan to 200 000 yuan and 300 000 yuan. In major farming seasons, the ministry organized government officials and agriculture technical staff to provide guidance and management for farmers, in order to make sure the responsibilities, project funds and policies are fully implemented. It also published a guidance book on how to improve grain output in a green way, and gave 5000 copies of the book to relate agricultural departments at provincial level and county level, as the guiding textbook for green growth. All the provinces sent the green growth techniques to the first line of production by the means of expert service hotline, message service platform and more

**4. Make demonstration to enhance implementation** The ministry hoped to play a leading role in guiding new type of management bodies such as large grain production households, family farm, and farmers' cooperatives to participate in the development of green growth model, and promoted the application of new varieties, new fertilizer and new agricultural machines, in order to promote the application of advanced technology. The country also played leading role in supporting socialized service organizations in agricultural machinery and crop protection, and carried out farming replacement and planting replacement, prevention and control and other professional services, in order to build the demonstration areas as management bases of high efficiency. In Hunan, it implemented 1142 projects that aim to promote green growth model, referring to one demonstration area, one processing enterprise, four cooperatives, and 20 large grain production households, which extended the industrial chains and promoted development at large scale.

**5. Supervise evaluation and implementation** The ministry required related organizations to plans, clarify pilot zones, objectives and methods, and achieve openness and fairness. The ministry monitored the process of major projects, found out problems, and supervised their work. During the harvesting period of summer grain, early season rice and autumn grain crops, the ministry organized experts to predict the yield and reformed the examination methods. In Shandong, it gave awards worth of 30 yuan per unit to qualify demonstration fields where green growth model was applied. In Shanghai, it selected 100 demonstration fields of high quality and gave subsidies worth of 30 000 yuan. In Shanxi, it honored the top 25 percent of counties based on their evaluation rankings, and criticized publicly counties below 70 scores on their evaluation.

## MAJOR ACHIEVEMENTS

**1. Green development concepts lead to new breakthrough** The MoA made a comprehensive use of safe input, physical techniques, informational technology and green prevention and control to promote a balance and coordinate development of production and ecology. In Heilongjiang, it carried out a campaign on a decrease in fertilizer, herbicide and

pesticides, and an increase in the thickness of soil plough horizon as well as the quantity of organic content in soil. The use of fertilizer, herbicide and pesticides was down by 3.1 percent, 6.1 percent and 6.2 percent respectively in 552 demonstration fields. In Jiangxi, it established 120 demonstration bases to use green prevention and control techniques, referring to biological prevention, ecological control, bio-pesticide prevention and control, light trap, color plate trap and sex pheromone trap, which resulted in a decrease by one to two times in the use of pesticides each season and a decrease by 2 percentage points to 3 percentage points in losses caused by diseases and pests.

**2. New progress was achieved in tackling key problems** The MoA organized scientific and research institutions, and education and promotion organizations to tackle key problems and make breakthrough in major chains. The ministry also made achievements in rice transplanting, maize grain harvesting and machinery sowing, planting and harvesting of oilseed rape, as well as machinery planting and harvesting of potatoes. In Hubei, it focused on the development of machinery seeding and seedling transplantation of oilseed rapes, and selected new varieties of Shengguang 127, which have a shorter growth period of 40 days more than common varieties. It also development machinery transplanting of growing seedlings, with a higher efficiency of 50 times more than human transplanting. In Hunan, it developed early season rice and middle -season rice rather than common varieties, and used narrow-row rice transplanters with 25 cm width. It also improved the rice seedling methods, and adopted rational close planting and seeding slinging, which made the output per unit at the demonstration area reached over 600kilograms.

**3. Service innovation promoted upgrading** The ministry promoted professional and socialized services in the whole process of cultivation and planting, and pushed forward organizational system innovation in food grain and oilseed production. In Jilin, it launched mobile phone message services for testing soil for formulated fertilization in 28 counties, which enable farmers to receive services at home and increase the rate of using the techniques of testing soil for formulated fertilization, exploring new means for agricultural technique promotion. In Sichuan, it called on large grain production households to play a leading role and implemented moderate-scale management models featuring rural land stock cooperatives and the model of large farmland with small households. It developed industrial management model featuring the integration of leading enterprises, specialized cooperative organizations and large grain production households, and built socialized service pilots for whole-process purchase in 20 high-yield counties, which improved professional services in the whole province. In Ningxia, it focused on six factors including expert guidance, agricultural capital supermarkets, formula fertilization by soil test, prevention arid control, agricultural machinery services, and technique training, and promoted one-stop social services in the whole process. The rate of technologies used in key chains stood at 95 percent, exploring a new model of comprehensive agricultural technology and service.

**4. Improvement of quality and efficiency made new achievement** It implemented technique training and improve output and efficiency. In Shandong, it promoted the standardization and mechanization of wheat and corn. In Guangxi, it relied on the Academy of Agricultural Sciences to develop a new breeding model of organic rice. During the growth period, no pesticides were used, which generated an output of more than 400 kilograms per unit. At the same time, it also got two batches of ecological ducks, generating 6000 yuan more revenues per unit. In Heinan, it cooperated with enterprises in Xihua County to explore fertilizer accelerators, with 30 percent of fertilizer saved per unit, and reduced topdressing for one time at the seedling stage. The output of wheat per unit increased h 5 percent to 10 percent, which realized fewer input and more output.

The achievement was also reflected in formulating a green model of high efficiency. It established 20 regional standardized technology models based on five regions, including

Northeastern China, regions along the Yellow River, Huaihe River, and Haihe River, as well as regions along the middle and lower reaches of the Yangtze River, as well as Northwestern and Southwestern regions, covering live major crops including rice, wheat, corn, oilseed rape and potato. It focused on five aspects of seed conservation, fertilizer conservation, water conservation, pesticide conservation, and environmental protection, and upgraded 20 green techniques which can increase output and save costs. It established a batch of models featuring high output and high efficiency. In Dezhou, Shandong, it established demonstration areas with an area of 100 000 mu (15 mu equals to 1 hectare), with an output per mu reaching 1517.5 kilograms, 80 percent higher than the average level of the province. It also generated an increase of 1260.6 yuan in yield per mu. In Guanghan, Sichuan, it promoted 10 demonstration areas of wheat, with yield per Unit reaching 687.6 kilograms. In Xiuwu County, Henan, the green model of high output and efficiency generated a yield per unit of 700 kilograms, with the highest yield reaching 800 kilograms per unit.

## CONCLUSION AND POLICY SUGGESTION

According to the requirements of the MoA, provinces throughout the country coordinated each other's efforts and made innovation and reform to build an updated model featuring improved output, leading change in agricultural development method.

In the future, the ministry will implement national grain safety strategy and grain storage strategy, and insisted on the working principles of improving quality, efficiency and incomes and achieving sustainable development. The ministry innovated the working ideologies and implemented all the strategies step by step, providing a strong support for stable development of grain production.

**1. Create a development platform** The ministry summarized experience in high-yield development and green growth model to make the high-yield growth model an excellent project which the government can promote and farmers have faith in. The ministry strictly selected bodies involved in the high-yield growth model development. The organizations should be the best of best, with a strong capability of learning new knowledge. Science demonstration households, star-level demonstration cooperatives, and new professional farmers, which all have strong demonstration effects, should be involved in the subsidy list. The ministry required high standards in production process. It selected high-yield and good-quality varieties, and adopted agricultural machinery of good efficiency and multi functions. It applied fertilizer with high efficiency and slow release, and pesticide with low toxicity and low residue. It also established standardized technique model based on the features of each organization. The ministry also improved management capability. It established evaluation methods and subsidy management methods in order to manage the projects more scientifically and precisely.

**2. Build an updated version** The ministry planned to build an updated version featuring green development and ecological environment protection. It focused on a decrease in fertilizer and pesticide and green protection and control, and explored a fallow model featuring rotation between plantation and protection, in order to promote a sustainable development in agriculture. The ministry tried to build an updated version featuring high efficient utilization of resources. It adopted integrated water saving irrigation, integration of water into fertilizer, precision drilling, balanced fertilization, precision drug delivery and other techniques, and promoted the utilization of agricultural wastes such as crop straws, excrements of live stocks and mulch, in order to save the cost, increase efficiency and improve quality. The ministry also tried to build an updated version featuring the improvement of productive efficiency. It adopted integrated mechanization in the whole production process. Internet+ and other techniques, in order to promote standardized

production, precision management, and industrialized operation.

**3. Tackle key problems** The ministry called on coordination between regions to tackle major problems. As for regional problems such as lime concretion black soils along the Yellow River, Huaihe River, and Haihe River, and exploitation of groundwater in North China, and heavy metal pollution in South China, the ministry coordinated related regions and provinces to cooperate to make major breakthrough. The ministry also dealt with major technique difficulties. As for technological problems such as wheat scab, rice blast, potato late blight, and other problems in the whole-process mechanization, it organized interdisciplinary and cross-cutting coordination and efforts to make breakthrough in variety breeding, disease resistant mechanism, and research and development in agricultural machinery. As for systematic problems such as inconsistent production standards, lack of key techniques, and unmatched agricultural machinery and technology, the ministry organized cross-department and cross-industry cooperation so as to make a breakthrough in such aspect.

**4. Promote service innovation** The ministry promoted the whole-process service in cultivation, plantation, and harvesting. The ministry supported the development of service organizations which are beneficial to agricultural machinery, crop protection and clay fertilizer, and provided services from plantation to harvesting, services at weak links, and seasonal services at major farming seasons, in order to satisfy diversified needs of different operation bodies. The ministry also developed an integrated service from production to sales. It explored agriculture-commercial cooperation featuring collaboration between agricultural enterprises and large grain production households, and collaboration among agricultural enterprises, large grain production households, and farmers' cooperatives, so as to improve such interest-binding mechanisms, which will benefit farmers from the whole industrial chain. The government also worked with enterprises and banks to provide services. The ministry developed cooperation in the field of financing inside the farmers' cooperatives, agricultural lease finance, and agricultural credit insurance in order to settle the bottleneck of agricultural production funds and lead more social capitals to involve in the development of green growth model.

**5. Promote publicity and guidance** The ministry promoted a common sense in society. During the major farming seasons and activities, the ministry organized the central mainstream media to report these issues and make the green concept public. It also interpreted major policies and measures, and introduced techniques and models. The ministry developed the leading role of representatives. It summarized good measures and experience in the development of green growth model and promoted it to the whole country. It also set up representatives and made them public. The ministry tried to create an atmosphere that is beneficial to the development of green growth model. It organized on-site views, integrations between agriculture and enterprises, and improved social awareness and public acceptability.

## REFERENCE

This article is translated from "2016 China Agricultural Development Report", which is the internal data of the Ministry of Agriculture.

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