



## **Background Policy Report**

# **Guidelines for the Regional Ecological Circular Agriculture Projects of the Comprehensive Development of Agriculture (2017-2020)**

**Report by**

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## Summary

On September 28th 2016, the Ministry of Agriculture (MOA) of the PR China issued the Guidelines for the Regional Ecological Circular Agriculture Projects of the Comprehensive Development of Agriculture (2017-2020), putting forward that about 300 ecological circular agriculture projects will be established in the next three years to promote the development of a resource-saving, environment-friendly and ecological conservation-oriented agriculture and to enhance the quality and safety of agro-food-products through standardized production, making agriculture more sustainable.

In order to implement the new development concept put forward by the central government, which is characterized by efficient utilization of resources, input reduction in agriculture, utilization of residues and cleaner production, and aims to enhance quality and efficiency and promote sustainable development of agriculture, MOA and the Office of National Agricultural Comprehensive Development are determined to begin promoting the construction of regional ecological circular agriculture projects in the comprehensive development project areas at the beginning of 2017. This is based on the prior pilot work. They came up with the following proposals, in accordance with the requirements of the central government and the policies for the national agricultural comprehensive development.

## 1. Overall requirements

### 1.1. Guiding principles

China should carry out the construction of the regional ecological circular agriculture projects under the guidance of the new development concept from the central government with focuses on tackling the major issues of agricultural production and ecological cycle. Occurring in a given region, the projects should make full use of existing production conditions and their industrial basis; give full play to the technical advantages of the agricultural departments and the guiding role of the financial funds of the Office of National Agricultural Comprehensive Development. Further they should make the right choices of the eco-agriculture cycling models, develop a comprehensive utilization of animal wastes and agricultural byproducts and a standardized cleaner production system, and let the re-coupling of crop and animal farming play a leading role in the agricultural comprehensive development project areas.

### 1.2. Basic principles

- (1) Overall design: The construction of the ecological circular agriculture projects should be designed and planned in a holistic way with priorities given to the key issues in a given area to ensure a smooth cycle of the industrial chain and utilization of resources.
- (2) Menu-style options: Choose what to construct according to the planned layout, cycle models and basic conditions to ensure smooth implementation of the model.
- (3) Carry out regionally: The project will be firstly carried out in the selected areas within a county to establish a group of eco-agriculture towns and then introduced to other peripheral areas.

(4) Marketized operation: With policy and financial support, the leading enterprises of agricultural industrialization, farmers' cooperatives and other new-type management bodies, which meet the requirements, are encouraged to participate in the construction and operations of the projects.

### **1.3. Objectives of the projects**

#### **(1) Overall objective**

About 300 ecological circular agriculture projects will be established in the next three years (2017-2020) to promote the development of a resource-saving, environment-friendly and ecological conservation-oriented agriculture and to enhance the quality, safety and a standardized production of agri-products, making agriculture more sustainable.

#### **(2) Performance objective**

The performance objective is to improve the regional utilization of agricultural resources and realize zero emission and total consumption of the agricultural residues. In order to achieve this goal, the integrated nutrient management system plan, the index system of the ecological circular agriculture projects construction and other management systems should be established to bring cycling models, technical solutions, operation mechanisms and policies and measures to work together. The overuse of chemical fertilizers and pesticides should be controlled or in other words, see zero growth. The utilization rate of animal manure, crop straws and residues from agri-product processing should reach over 90%. The use of organic nitrogen fertilizers such as animal manure and crop straws should account for over 30% of the total nitrogen fertilizer applied in field crops. The value of the agri-products should increase by over 10%. And the income of farmers should also see an increase of over 10%. The standard of agricultural production and moderate-scale operation should be improved to achieve the goal of resource conservation, cleaner production, cycling utilization and production of safe products.

## **2. Major contents for construction**

The projects should be designed according to the complete chain of ecological agriculture and to the actual situation of the selected place with focus on the key areas, measures and technologies. In principle, the construction of the projects must cover the utilization of waste from animal husbandry, development of the agricultural byproducts and standardized cleaner production, while in the meantime taking into consideration the multiple channels of resource utilization and waste treatment.

### **2.1. Utilization of waste from animal husbandry**

One or more cycling models can be carried out according to the farm's manure treatment technologies and supporting field area for consumption/recycling, ensuring that the animal waste is comprehensively used and discharged in line with the emission standards.

(1) The model of the integrated crop and animal farming: For the farms with coupled farmland, mountains, fruit trees and tea gardens, the farmers can realize the utilization of animal waste and zero emission of waste sewage by applying the fertilizer disposed through biogas fermentation or oxidation ponds directly to the farmland. What needs to be constructed for these models includes anaerobic fermentation equipment, facilities for aerobic treatment, storage of the biogas slurry or fertilizer water and their transport, field pipelines and other supporting facilities.

(2) The model of "substitution, separation and utilization": The "substitution" includes three kinds, i.e. (1) substituting manure cleaning with water or through manual drying with discharged manure through leaking floors with scrapers, (2) substituting unlimited use of water with controlled use of water, and (3) substituting open discharge with underground sewage discharge. The "separation" here means separating solid waste from liquid waste and diverting rain out of the sewage. While for

the animal manure, it will be used to compost organic fertilizers and the sewage from animal husbandry will be applied to the farmland after being treated in oxidation ponds. What needs to be constructed mainly includes renovation of rain and sewage diverting pipe systems, purchase of mechanized manure cleaning equipment, solid and liquid waste separation equipment, solid manure forced ventilation aerobic composting system, and facilities for storing sewage during oxidation pond treatment and for transporting fertilizer water and utilizing them onto the farmland.

(3) The model of advanced treatment of sewage: Advanced technologies for sewage treatment should be adopted to improve the treatment of sewage from animal husbandry by combining efficient anaerobic and aerobic techniques, thus reaching the standard for emission. What needs to be constructed includes the facilities of sewage collection, pretreatment pools, anaerobic fermentation tanks, aerobic treatment tanks, multilevel biological purification ponds, disinfection pools and membrane bioreactor pools and the supporting facilities such as sewage pumps, solid and liquid waste separators and aeration devices.

(4) The centralized treatment model in the areas with high density of animal husbandry: For treatment of the solid manure in the areas with high density of animal husbandry, a complete chain composed of transporting, mechanical stirring, composting, crushing and organic fertilizer processing will be developed to add the value of the fertilizers. For the sewage from animal husbandry, it will be treated in the following steps: temporal storage on the farm, transport by pumping trucks, separation of solid waste from liquid waste, highly efficient biological treatment, storage of fertilizer water and application onto the farmland to enhance the treatment efficiency and achieve the goal of sewage utilization. What needs to be constructed mainly includes sewage storage facilities, sewage transport equipment, facilities for production of organic fertilizers, and other facilities for biological treatment of the sewage and utilization of the fertilized water.

## **2.2. The comprehensive development of the agricultural byproducts**

The agricultural byproducts such as crop straws and residues from the agri-product processing can be used as materials to produce feed, fertilizers, base material and fuel to facilitate the utilization of the agricultural residues.

(1) Use agricultural byproducts to produce feed: The system of collection, storage and transport of the agricultural byproducts shall be improved according to the geographical conditions. Dehydration, biological fermentation, silage and other processing methods should be adopted to produce breeding feed, protein feed or fully mixed diets. What needs to be constructed includes storehouses, raw material yards and other storage facilities, the feed processing facilities such as raw material processing plants, feed processing workshops and readily-made product warehouses, and sewage treatment facilities.

(2) Use agricultural byproducts to produce fertilizers: The crop straws can be used as fertilizer by directly returning them to the field or after decomposing or composting, while the residues from agri-product processing can be used to produce organic fertilizers through the mixed composting fermentation technology. What needs to be constructed includes the machines for returning straws to the field, the decomposing bacterium agent and the facilities for collecting, transporting, crushing, drying, turning and packaging of the crop straws.

(3) Use agricultural byproducts to produce base materials: The straws and agri-product processing residues can be taken as major materials, in combination with cattle dropping, wheat bran, and soybean cakes to make organic solid materials, which can provide certain nutrients the microorganisms need to produce edible fungi. What needs to be constructed mainly includes the substrate raw material preparation workshops, substrate production and storage houses, bacteria sheds and the machinery equipment for raw material crushing, preparation of strains, sterilization and inoculation.

(4) Use agricultural byproducts to produce fuels: The agricultural byproducts can be taken as raw materials to manufacture grain, block or rodlike briquettes fuel. They can also be turned into clean flammable gas to provide quality energy for life and production activities. What needs to be constructed mainly includes raw material yards, fuel production and processing workshops, gas transmission pipeline systems, crushing and briquetting machines, the equipment needed for gas storage, dust removal and measurement and special burning appliance.

### 2.3. Standardized cleaner production

As for the standardized cleaner production in agricultural activities, priorities should be given to the standardized production, farmland protection, ecological farming by combining rice growing and aquafarming and control of pesticides and chemical fertilizers, which contains nitrogen or phosphorus.

(1) Facilities for standardized production: In order to save water and control the use of fertilizers and pesticides, the infrastructure should be improved along with the promotion of the integration of irrigation and fertilizer application, holistic prevention and control of pests and diseases etc. Besides, the agricultural production should be standardized to ensure the safety and quality of products. What needs to be constructed mainly includes greenhouse, processing workshops, storehouse, and the auxiliary facilities for renovating power transformer lines, power capacity increase and protection walls. The irrigation and discharge system, field paths, land levelling and other field projects should be developed and the facilities for irrigation and fertilizer application and the prevention and control of pests and diseases should be equipped.

(2) Facilities for farmland protection: Tanks should be built in the field on the basis of the type of crops and their consumption of fertilizers to store biogas slurry, residue and composting fertilizer respectively, so it will easily be accessible for application in spite of the seasonal demand. The pools should be built to collect chemical wastes like discarded mulch film, pesticides and fertilizers and be packaged to avoid causing environmental pollution. Deep tillage farming, zero tillage farming with straws cover, combined use of chemical and organic fertilizers and other technologies should be promoted to improve the soil condition, enrich the soil biodiversity and enhance the micro-ecological function of the soil.

(3) Facilities for ecological farming with aquafarming in the rice field: For water network paddies and the areas with many fallow fields in winter, bases can be built to develop ecological farming by keeping fish, crabs, shrimps, loaches and so on in the rice fields. To carry it out, the irrigation and discharge system, furrow pit projects, governance of rice paddies and the facilities for prevention of fish escaping, pests and diseases should be constructed. The pools for fattening, temporary keeping and overwintering of aquatic animals should be built, together with greenhouse workshops, inspection rooms, processing workshops and storehouses. The instrument for product quality inspection, fishing, processing and use of water and electricity should be equipped, too.

(4) Facilities for controlling the source of pesticides and fertilizers, which contains nitrogen or phosphorus: The irrigation canals and ditches should be governed according to the geographical conditions by regulating the structure, removing sludge, consolidating the edges and slopes, rationally distributing the aquatic plant community and building grillages and permeable dams. The nitrogen and phosphorus should be recycled through holding up in slope farming. Vegetative filter strips and collection and storage runoffs should be constructed to reduce the pollution caused by nitrogen and phosphorus.

### **3. Target areas, groups and application requirements**

#### **3.1. Target areas**

The project areas must be agricultural comprehensive development counties, which have clear-cut development concepts, obvious leading industries, well-performed management bodies of new-type agriculture and quite developed circular models. The basic requirements are as follows:

(1) The governments of county or municipal level have given high priority to the development of ecological agriculture and have worked out plans for eco-agriculture development, the comprehensive utilization of animal manure, crop straws and other agricultural residues or the plans for aquafarming in rice fields;

(2) The governments of county or municipal level have established mechanisms for organizing and coordinating eco-agriculture development and once carried out the innovation and exploration of its management systems;

(3) Priorities should be given to the major counties of agriculture, animal husbandry and aquafarming, the counties and municipalities listed in National Modern Agriculture Demonstration Areas, National Agricultural Comprehensive Reform Pilots and National Sustainable Development Experimental Demonstration Zones as well as other counties and municipalities, which involve in comprehensive utilization of agricultural residues, promote cycle farming of planting and animal husbandry or substitute organic fertilizers for chemical ones in fruit, vegetable and tea growing. The key areas of ecological conservation and construction in the central and western regions should be taken into consideration, too.

#### **3.2. Target groups and application requirements**

The projects mainly target the following two groups:

(1) Leading enterprises and farmers' cooperative organizations

- How to apply: the target groups can alone or jointly apply for the projects.
- Application requirements: Applicants should 1) have registered in the industrial and commercial sector for more than one year and be able to carry the business; 2) have no bad credit records nor be listed in the blacklist of supervision through the check of CREDITCHINA net and Chinese Government Purchase Net; 3) have professionals for ecological conservation and strong technical forces; 4) entrust specialized organizations as technical supporting institutions to help monitor regional ecological environment and comprehensively manage the nutrients; 5) the project's location must be specific administrative regions (at least one town) with clear boundaries and with continuous paddy fields. For those who can't carry out the project around the whole town, the area of the farmland must cover at least 10,000 mu and the scale of animal farming must be not smaller than 15,000 heads of pigs equivalent.

(2) The government at county and town level

- How to apply: the government at county and town level puts forward the project application scheme based on the actual situation and clarifies the area, cycling model, construction bodies and content, operating mechanism, capital calculation and source of the project.

- Application requirements: The government at county or town level, which applies for the project must entrust specialized organizations as its technical supporting institutions to help monitor regional ecological environment and comprehensively manage the nutrients. The project's location must be special administrative regions (at least one town) with clear boundaries and with continuous paddy fields. For those which can't carry out the project around the whole town, the area of the farmland must cover at least 10,000 mu and the scale of animal farming must be not smaller than

15,000 heads of pigs equivalent. And the government has not been listed in the blacklist under supervision.

The government takes responsibility of organizing and coordinating the application and implementation of the project. Direct engagement in the construction and operation of the project is prohibited.

### **3.3. Financial input**

The Central Finance will grant about 10 million yuan to each project, but it can also be lower in the provinces, where the local fiscal input accounts for a high percentage with total central finance input controlled within 15 million yuan per project. In principle, the percentage of local financial input and of the fund the project organization raised by applicants shall be treated in line with the policy for the industrialization of the agricultural comprehensive development projects.

For the provinces, which basically meet the requirements, no more than 3 projects can be developed each year, while for the provinces with better conditions, additional projects are possible, but the total number of the projects can't exceed 6.

The term of construction is one year.

## **4. Administration requirements**

Following the principle of "streamlining administration and delegating power to lower levels, combining power delegation and regulation, and optimizing services", MOA will completely delegate the power of project review and approval to the provincial departments.

(1) The provincial department of agriculture should, according to the financial input of the central finance and the policies for the agricultural comprehensive development, take the lead to organize the work of the project application and review and approval and strictly administer each of these procedures. For example, the agricultural department should ask for the opinions of the concerned departments at the same level when organizing and applying for the projects. The projects must be publicized for at least seven working days on the website of the provincial department of agriculture before they are approved. And after they are approved, the agricultural department should, together with the provincial financial department (the office of agricultural development) report to MOA and the Office of National Agricultural Comprehensive Development for the record and reply the project implementation plan timely. Besides, the agricultural department should strengthen inspection and supervision to ensure the quality of the project and efficient use of the funds and never stop exploring better models for eco-agriculture development.

(2) The organizations, which apply for these projects should work out performance objectives in a scientific way and honestly report them. The provincial department of agriculture (including departments of animal farming and aquaculture) and of finance (the office of agricultural development) should strengthen the review and administration of the performance objectives, report the set objectives to MOA and the Office of National Agricultural Comprehensive Development for review and approval, and periodically track the project status so as to ensure the success of the projects.

(3) During the construction period, MOA and the Office of National Agricultural Comprehensive Development will inspect and evaluate the implementation of the projects from time to time, and will, in the principle of "awarding the well-performed and punishing the poorly-performed", offer more support to the well-performed provinces and temporarily cancel the qualification of application for those projects, which fail to reply the project plan timely, perform poorly in regulation and do not check and accept the implementation results.