

China's Subsidies for the Development of Green Agriculture: A Policy Analysis

Research Summary¹, February 2022

1. Research Background

Agricultural green development is an important approach to ease resource constraints, prevent and mitigate environmental pollution and protect agroecology. In November 2016, the Chinese Ministry of Finance and the Ministry of Agriculture published a “National Plan to Set up Reforms of the Agricultural Subsidy System towards a Green Ecology following consultations of the Deep Reform Group of the Central Government. This plan indicates that China will establish a green ecology-oriented agricultural subsidy system and continue consistent promotion and gradual adjustment to ensure national food safety and stable income growth of farmers. A reform of the existing subsidy policies is necessary, especially in the areas that restrict sustainable agricultural development. In addition, to advance agroecology in the country, future Government support should focus on restoring major ecosystems, such as farming land, grassland, forestry, and wetland, and design effective supporting policies that remediate cultivated lands with heavy metal pollutions, agricultural non-point source pollution, promote water conservation, and shift the policy objectives from purely quantitative growth to an equal emphasis of quantity, quality and ecology.

The government has taken steps to establish domestic policies on agricultural environment protection and started designing an agricultural green subsidy policy. The primary goal of the new subsidy in its current stage is to guarantee food security, ensure self-efficiency of major agricultural products such as rice and wheat and increase farmers' incomes. The secondary goal is to ensure food safety, environmental protection, the competitiveness of China's agriculture, and agricultural sustainable development. However, whether domestic agricultural green subsidy policies have redirected and met the goal to efficiently solve Chinese agricultural environmental issues and whether they truly incentivize agricultural green production a few years into the implementation of the Plan, remains to be addressed.

To better understand the effect of subsidies and other policy measures on sustainable agriculture,

¹ This project was conducted in collaboration with a research partner.

especially with regard to the natural resources used in agricultural production, e.g., soil, water and resource use efficiency in agriculture, this study was conducted in two stages. **The first stage of work** focused on summarizing the intended purposes of China’s agricultural policies, particularly subsidies implemented to date. The analysis focuses on policy and subsidy schemes in the last ten years at central and provincial government levels and their approaches to implementation. **In the second stage** we analyzed in depth the implementation and impact of two policy and subsidy schemes in certain provinces. These will be selected to conduct detailed studies on how such schemes are implemented on the ground (including field studies), the extent of behavior changes by farmers, the impact of these changes on crop diversification, yields, and income, as well as any opportunities for policy adjustment.

2. Research Methods in the 1st Stage of the Study

In this part of the study, we conduct a qualitative analysis on environmental effects of these policies, to initially screen environmental-friendly agricultural subsidy, environmental-neutral agricultural subsidy, and environmental-unfriendly agricultural subsidy and thus to lay the groundwork for conducting quantitative appraisal of the selected subsidy policies.

The research framework is illustrated below (Fig.1):

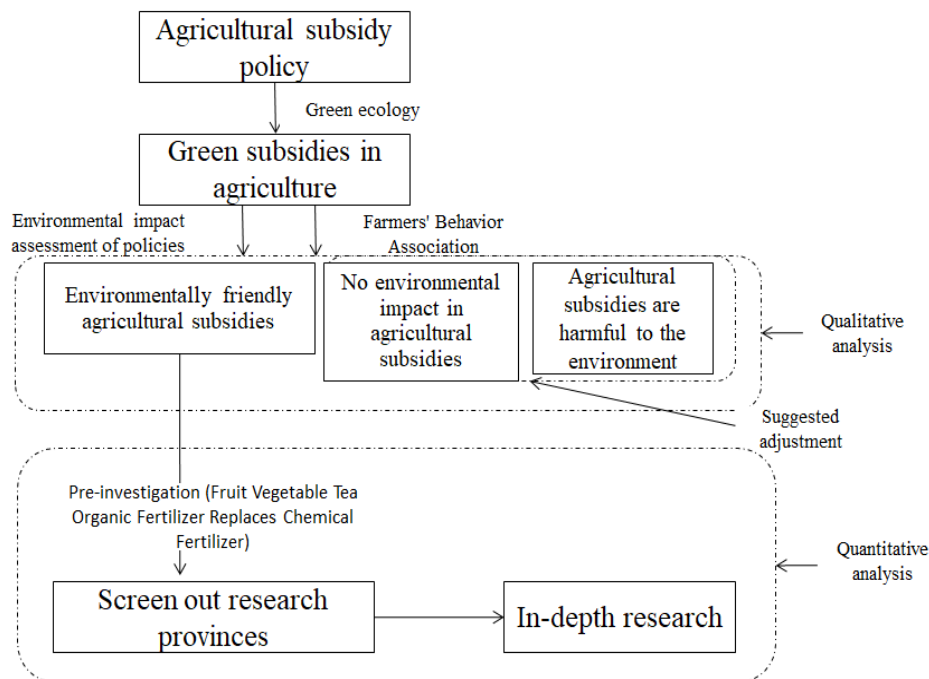


Figure 1 Research Framework of Agricultural Green Subsidy

In the environmental impact assessment of the agricultural subsidy policy, the first step was to confirm the objective of the agricultural subsidy policy to help appraisers formulate a reasonable appraisal scope. The second step was to analyze the causal relationship of agricultural subsidy policies, which is a

combination of qualitative and quantitative research methods supplemented by research. The third step was to select the target policy for further in-depth quantitative analysis and research. The analysis of the policies' effectiveness needs to be based on the requirements of policy objectives and objects of action. The evaluation mainly includes three aspects: 1) whether the policy meets the requirements of the target and is conducive to the realization of the goal; 2) whether the policy itself is reasonable in design, and reflects the characteristics and requirements of the policy itself; and 3) whether the policy can be implemented, the external conditions for the implementation of the policy are satisfied, whether there is a deviation from the policy goal, and whether there are interference factors other than the policy.^[2]

3. Research Content in the 1st Stage of the Study

Existing agricultural green subsidy policy in China covers national policies, rules, and documents. Based on different methods, it can be categorized into subsidies aiming to share producers' economic cost (disposable subsidy) and subsidies aiming for economic compensation to producers in consecutive years (continuous subsidy). The agricultural green subsidies analyzed herein cover subsidies for universal purpose and regional projects. They share resemblance in investment on the part of Central Government and aim at improving agricultural environmental quality and preserving natural resources. While analyzing the policies, we realized that some policies have not yet reached the goal of "green". Therefore, some statements below show a more generic connotation of "agricultural subsidies involving environmental objectives".

Agricultural green subsidy systems considered in this report have explicit environmental objectives or aim to improve the environment through the subsidy (Table 1).

Table 1 Environmental Objectives of Major Agricultural Subsidies

Subsidy Policy	Policy Objectives Involving the Environment
Subsidy on Grassland Ecology Protection	Contain overall worsening of grassland ecology countrywide
Subsidy on Cultivated Land Protection and Quality Improvement	Propel transformation and utility of organic fertilizer, reduce pollution, improve environment and boost quality of cultivated land
Treatment of Heavy Metal Contaminated Soil in Hunan	Ensure safety of people's livelihood, control industrial pollution sources, and address pollution caused in the past
Pilot Project of Black Soil Protection in Northeast China	Check degradation of black soil, continuously boost quality of cultivated land in black soil and improve ecological environment of black soil area
Comprehensive Treatment of Groundwater Over-exploitation in Hebei	Realize balance of underwater collection and supplementation on provincial level, round rise of underwater level in urban areas, work out issues of underwater overdraft at shallow level and drastically reduce exploitation amount of underwater at deep level

^[2] Jin Shuqin, Han Dongmei, Wu Nawei. Policy evaluation of pollution prevention and control of livestock and poultry farming in China[J]. Agricultural Economic Problems, 2018(3):119-125.

Comprehensive Utilization of Agricultural and Rural Wastes such as Livestock and Poultry Manure	Realize comprehensive utility of agricultural and rural waste and reduce environmental pollution
Subsidy on Crop Rotation and Fallow	Adjust and work out balance of organic matters in soil layer and realize the purpose of protecting cultivated land productivity
Agricultural Film Recycling	Control 'white pollution'
Testing Soil for Formulated Fertilization	Boost use of manure and reduce chemical fertilizers use, promote crop yield, improve quality of agricultural products, save labor force, save costs, and improve incomes
Grain to Fodder Transition	Boost revenue from plantation, and gestation and breeding efficiency of grass-feeding livestock
Increasing Organic Fertilizer Used in Fruit, Vegetable and Tea Planting instead of Chemical Fertilizers	Improve the combination of crop cultivation and animal husbandry
Subsidy on Protection of Cultivated Land Productivity	Boost farmland productivity and operation of moderately scaled grain farms

Our analysis revealed that the motivation of farmers involved in environmental protection through subsidies varies, and the motivation for farmers to take actions to protect the environment during the implementation phase is also different. Our analysis covers 12 agricultural subsidies that integrate environmental objectives in the policy mandate. The influencing factors on environment were judged based on the subsidy policy statement. The degree of farmers motivation to adopt environmental-friendly practices through subsidy provision or project implementation were assessed (analysis and summary can be seen in Table 2). Our analysis showed that most subsidy policies have had a positive driving effect on farmers' behaviors towards environmentally friendly practices. We therefore categorized those as environmental-friendly subsidies. Other subsidy policies have had no or limited effect on farmers behaviors. These were categorized as environmentally neutral subsidies."

Table 2 Analysis on Agricultural Subsidy Policies Involving Environmental Objectives

Name of Subsidy Policy	Desired Effects	Environmental Influencing Factor	Motivation to Propel Farmers' Protection of Environment
Subsidy on Cultivated Land Protection and Quality Improvement	Propel transformation and utilization of organic fertilizer, reduce pollution, improve environment, boost cultivated land productivity.	Soil, atmosphere	Strong for some farmer households
Treatment of Heavy Metal Contaminated Soil in Hunan	Ensure safety of people's livelihood, control industrial pollution source and improve pollution left in the past	Soil	Strong for farmers in the program
Grain to Fodder transition	Expand plantation area of silo corn and other qualified forage grass, add to warehousing amount, roundly boost comprehensive capacity	Indirect reduction of straw and fertilizer	Strong for farmers in the program

	and socialized service level of seeding, storage, harvesting and use		
Pilot Project of Black Soil Protection in Northeast China	Control degradation of black soil, continuously work on quality of cultivated black soil and improve ecological environment in the black soil area	Soil	Strong for farmers in the program
Testing Soil for Formulated Fertilization	Adjust clash between fertilizer needed by crops and fertilizer needed by soil	Soil	Weak household access level
Comprehensive Treatment of Groundwater Over-exploitation in Hebei	Decrease groundwater overdraft amount, realize balance of collection and supplementation of underwater and continuously improve ecological environment of water	Soil, water	Strong for farmers in the program
Comprehensive Utilization of Agricultural and Rural Wastes such as Livestock and Poultry Manure	With amount reduction at the source, process control and end-term use as the core, work out regional layout of animal husbandry, propel resource use of livestock feces and boost use efficiency of methane and biological natural gas	Soil, atmosphere	Strong for farmers in the program
Increasing Organic Fertilizer Used in Fruit, Vegetable and Tea Planting instead of Chemical Fertilizers	Reduce use of chemical fertilizers, boost product quality and raise soil quality.	Soil, atmosphere	Strong for farmers in the program
Agricultural Film Recycling	Innovate recycling system, propel recycling of agricultural film, raise resource level of agricultural film and fend off 'white pollution'	Soil, atmosphere	Strong for farmers in the program
Subsidy on Protection of Cultivated Land Productivity	Protect cultivated land productivity and moderate-scaled operation of grains	Cultivated land productivity	Weak, almost unhooked
Subsidy on Grassland Ecology Protection	Protect grassland ecology, ensure supply of mutton and beef and increase income among herdsman	Ecological grassland environment	Strong for farmers in the program
Subsidy on Crop Rotation and Fallow	Boost the production technology model with land planting and fostering in combination and comprehensive treatment and probe into formation of an interactive relationship among crop rotation, fallow land, grain adjustment and surplus and deficiency of supply of major agricultural product	Groundwater, cultivated land quality	Strong in the project area

4. Research Results and Conclusion

As the concept of green development has deepened in recent years, China's agricultural subsidy policy has been gradually transitioning to gear towards green and eco-friendly agriculture. Based on a preliminary

analysis of this project, the following conclusions can be drawn:

- 1) Fundamental changes have occurred in the policy directive. The past subsidies including comprehensive direct subsidies for agricultural inputs, seed subsidies, and direct subsidies for grain producers have been combined into “agricultural support protection subsidies”, the largest of which is the subsidy on cultivated land productivity.
- 2) Subsidy on cultivated land productivity currently still has some gaps, especially in establishing a strong link to protection of cultivated land fertility. However, there is some exploratory work done at local levels, which can provide successful experiences for other parts of the country to replicate.
- 3) Sustainability outcomes of subsidy policies in most project-based pilots remains to be tested. The level of farmers’ participation is relatively low, and it is difficult to develop long-term mechanisms after the withdrawal of project funding. More scientific and overall evaluations for policy implementation are needed.
- 4) At the national level, policy subsidies have been adjusted, expanded, or eliminated on an annual basis.

Based on this review of agricultural subsidies in China, the following principles are proposed to select the subsidies for the second stage of in-depth study. First, avoiding selecting the subsidy policies which have been sufficiently studied previously and showed high consistency in the literature. Second, avoiding policies or subsidy projects with highly national security sensitivity that can result in difficulties of obtaining field data. For example, the topic related to grain security or the heavy metal issue in soil. Third, policies or projects featuring high regional characteristics and small range of area should be averted if it were not for special preference. Fourth, the possibility of finding local cooperators should be considered. We can work with local government and scientific research departments and choose the right regions and right projects to conduct assessments to ensure successful implementation of follow-up assessment.

In summary, based on the preliminary research and the cooperation between project parties and local governments, it is suggested that one to two counties in **Gansu, Inner Mongolia, and Hebei** provinces shall be selected to conduct the follow-up in-depth investigation with regard to two major subsidies. They are the subsidy of organic fertilizer used in fruit, vegetable and tea planting in replacement of chemical fertilizer, and the subsidy on crop rotation and fallow. Assessment can be done on implementation process of subsidy policy, impact of environmental improvement and farmers’ acceptance and adoption mentality, as well as suggestions for overall improvement.