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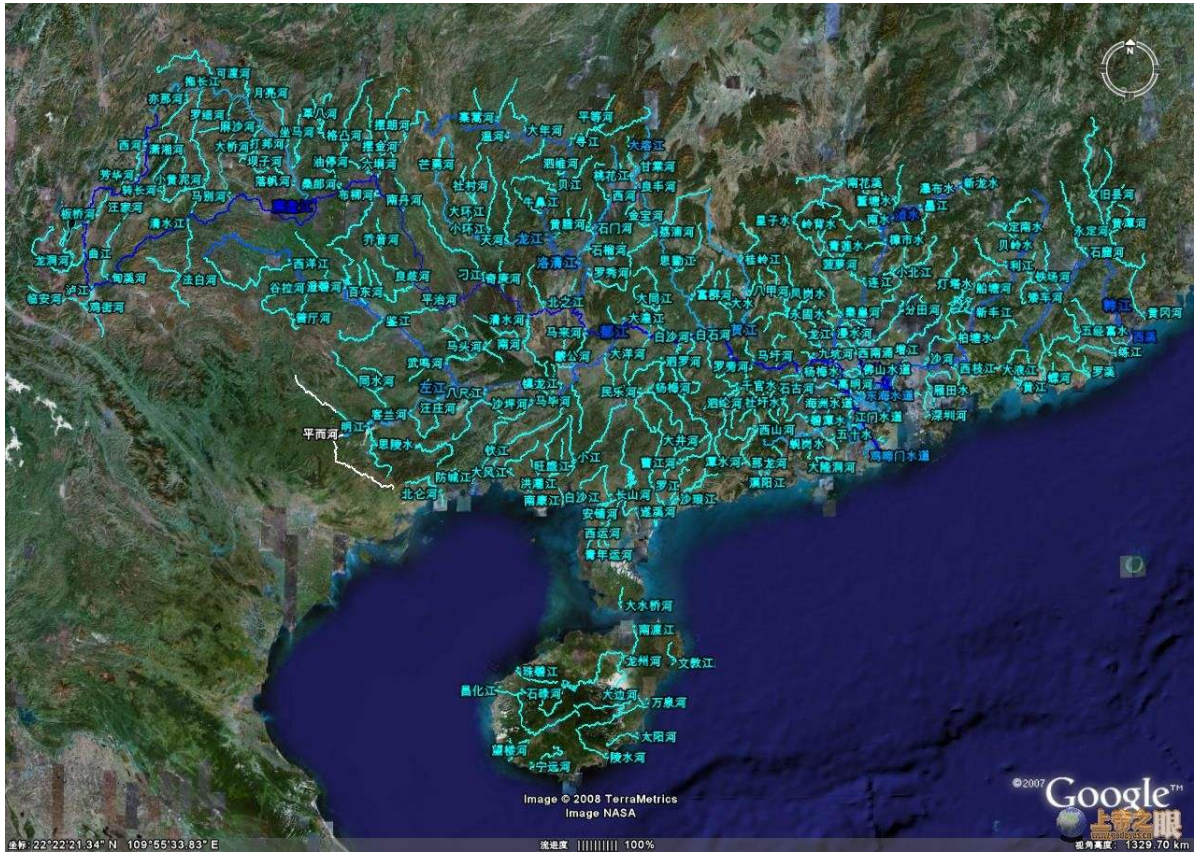
15-19 July 2019
Qingdao, PR China

Agricultural Pollution Control for the Prevention of Water Eutrophication

Hu Xueying Lin Birun
Management Office of Guangdong Agricultural Pollution Control Project

Characteristics of Water System in Guangdong Province

- There are many rivers and few lakes in Guangdong Province, with a total of 1343 rivers of a total length of more than 25,000 kilometers.
- Main rivers: the Pearl River, the Han River, the Jianjiang River and the Moyang River etc.
- Characteristics of rivers in Guangdong: large discharge, low sediment concentration, long flood season, no freezing all year round and abundant hydraulic resources.
- Agricultural non-point source pollution is the main reason for water eutrophication.
- Therefore, the prevention and control of agricultural non-point source pollution is of great significance to the control of watershed nutrition management.



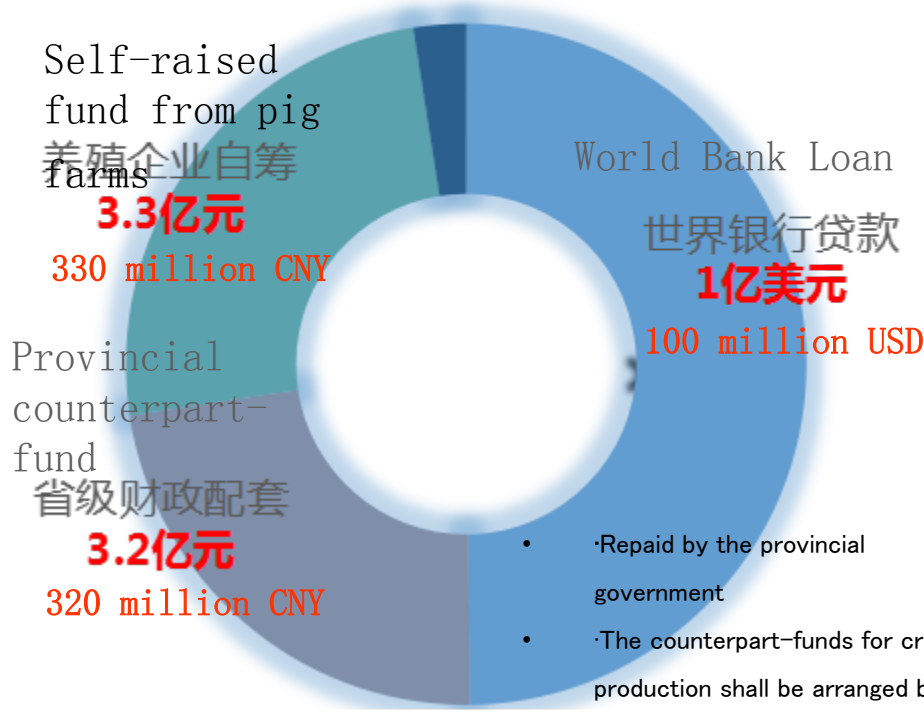
Progress of Guangdong Agricultural Pollution Control Project

Project overview

- **Guangdong Agricultural Pollution Control Project is the largest one in Asia which use World Bank loan to control agricultural pollution, and it is also the first pollution control project funded by the World Bank in China.**
- **Project Objectives**: Reduce water pollutant releases from crop and livestock production
- **Project Investment**: 213 million US dollars (RMB 1.34 billion)
- **Project Contents**: Environmentally Friendly Crop Production; Livestock Waste Management(LWM); Monitoring and Evaluation(M&E), Capacity Building, Knowledge Management(KM); Project Management.
- **Project Closing Date**: June 30, 2021

GEF Grant 5.1 million USD

全球环境基金赠款510万美元



- ·Repaid by the provincial government
- ·The counterpart-funds for crop production shall be arranged by the provincial government
- ·The counterpart-funds for LWM by the provincial government and farm owners with a proportion 3:7

Composition of project funds

Main Achievements

(I) Establishment of compensation mechanism for agricultural pollution control based on informationization

(II) Establishment of incentive mechanism for promotion of agricultural pollution control technology focusing on villages and towns

(III) Establishment of goal-oriented monitoring and evaluation mechanism for agricultural pollution control

(IV) Created a new model of high-rise ecological breeding

(V) Created a new model of conservation agriculture in the Southern area

(VI) Establishment of a new model for fund management of agricultural projects

I. Establishment of an agricultural pollution control compensation mechanism based on informationization to ensure accurate, safe and efficient subsidies

- For different compensation objects such as small farmer households, large planters, farms, enterprises and cooperatives, different compensation standards and compensation methods have been formulated, and 10 types of compensation policies have been established.

- At present, the project has accumulated 500 million CNY in sales of environmentally friendly fertilizers, pesticides and spraying equipment, and 150 million CNY in subsidies to farmers.

IC card compensation mechanism has achieved five objectives:

- Farmers enjoy government subsidies conveniently and quickly
- Efficient and safe management of funds
- Farmers are buying and scientifically using environmentlly-friendly agricultural inputs
- The establishment of farmers' planting information big data will enable the project to be managed scientifically and accurately
- The interests of all parties will be considered for more benefits.

II. An incentive mechanism for the promotion of agricultural pollution control technologies has been established to solve the "last mile" problem, with focus on villages and towns.

Town technical instructor (2 per town)	Excellent, good, qualified, Monthly rewarded 2000 yuan, 1600 yuan, 1200 yuan respectively
Village technical instructor (2 per village)	Excellent, good, qualified, Monthly rewarded 1200 yuan, 1000 yuan, 700 yuan respectively

01

Technical support system is established.

The provincial, municipal and county expert group are responsible for assisting in the design, evaluation and supervision of projects, discovering problems in time and providing solutions.

02

03

Technical personnel in villages and towns shall be rewarded

The implementation agreement is signed with the CPMO, and the accumulated incentive funds of **15.34 million** yuan are distributed once a year

A grassroots technical promotion team is built.

A technical service system with more than 1,200 agricultural technicians from towns and villages has been formed, and 2 village-level assistants (local farmers) has been employed in each village to jointly carry out the project technology demonstration and guidance, and an effective incentive system has been established.

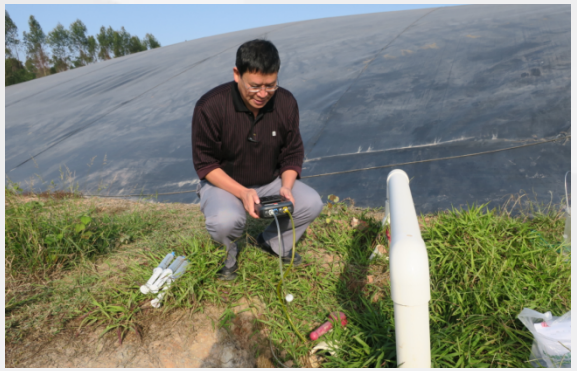
The project has promoted 89,000 tons of formula fertilizer, 1,419,000 kilograms of high effeciency, low-toxic and low-residue pesticides and biological pesticides, 93,000 sets of highly effective electric sprayers, more than 4,000 solar insect-killing lamps and over 7 million yellow sticky boards.

III. A goal-oriented monitoring and evaluation mechanism for agricultural pollution control has been established, and it will comprehensively monitor project performance.

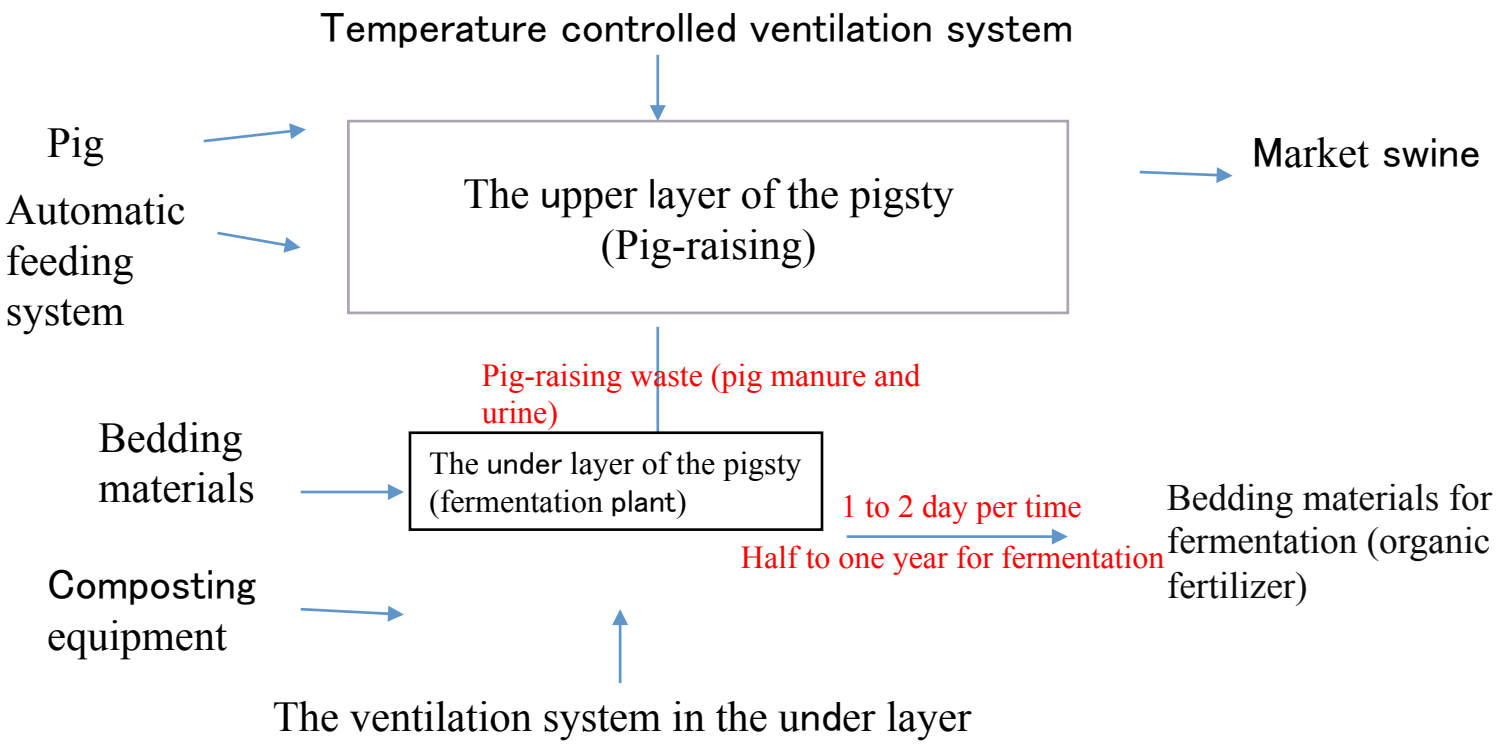
Third-party professional institutions

422 Indicators in total

- ✓ Pesticide Residue Monitoring
- ✓ Pest Management Plan(PMP)
- ✓ LWM Environmental Monitoring
- ✓ High-bise Breeding Monitoring
- ✓ Conservative Agriculture Monitoring
- ✓ Social Security Monitoring
- ✓ Environmental monitoring for the demonstration project of chemical fertilizer reduction and pollution control
- ✓ EMDF Monitoring


IV. A new model of high-bed ecological breeding type is created, which has formed an ecological “closed cycle”.



Renderings of high-rise pigsty

- The first layer is a the fermentation layer with bedding materials, with a height of 2.5 meters, which can absorb pig manure and urine. After being turned over mechanically, it will turn into semi-decomposed organic fertilizer after two or three pig-raising cycles.

- The second floor is used for pig-breeding. The height of the roof is 2.5 meters high. During the breeding process, there is no flushing. The manure and urine produced by pigs fall into the bedding materials of the first layer through the leakage board.

High-rise Fermentation Type Ecological Breeding

- Because of factory production and modern management, the feed conversion rate, pig weight and other indicators are higher than that of traditional breeding. At present, the Project has 7 high-rise farms, of which 5 are in operation.

Key features

- Source reduction: minimize wastewater discharge (over 80%)
- Full use of resource: organic fertilizer production, land-saving etc.;
- High productivity: more than 2500 pigs can be managed by one person, 5 times than that of traditional breeding.

Farm waste management and resource utilization——Anerobic fermentati

Steel-concrete Tank

Covered lagoon pool

Biogas power generation set

Red mud plastic film pool

Enamel steel

Biogas slurry utilization pipe network

V. A new Conservation Agriculture Mode suitable for southern region has been established, combining land use with land conservation.

Conservation Agriculture(CA)

Traditional Tillage

Concept of CA Mode

FAO

Three principles of CA

- **Three CA principles: minimal soil disturbance, permanent soil cover and crop rotations.**

(Sources：http://www.fao.org/ag/ca/)

Conservation tillage is an advanced agricultural technology with minimum and no-tillage, returning stubble to field and no/reduced tillage sowing with fertilization as its main contents. It aims to protect the ecological environment, promote the sustainable use of farmland and increase efficiency.

Project Progress

Component	Category	2014	2015	2016	2017	2018
Crop production	Municipality	2	2	8	10	10
	County	6	6	15	27	27
	Town	6	12	47	88	98
	Village	50	118	240	448	596
	Farmers (Unit: Ten thousand)	1.2	2.5	5.3	9.6	10.9
	Planting company	10	14	33	50	178
	Farm land controlled (Unit: 10, 000 mu)	7.2	17.2	29.3	46.4	69.2
LWM	Projects incorporated into treatment	12	87	142	134	140
	Project completed	0	0	12	44	89

Indicator completion(By the end of 2018)

No. s	Index	Unit	Target value	Completed in 2018
1	Mass of COD pollution load reduction achieved under the project	Tons/year	45,000	39356
2	Nitrogen ammonia reductions achieved under the project	Tons/year	5,000	2375(crop production excluded)
3	BOD load reduction achieved under the project	Tons/year	14,000	13785
4	Phosphorus load reduction(TP) achieved bunder the project	Tons/year	250	584(not including crop production excluded)
5	Reduction in total of pesticide consumption of project areas	Tons/year (effective ingredients)	135	367
6	WHO Class I pesticide residue compliance rate	%	100	100
7	WHO Class II pesticide residue compliance rate	%	96	100
8	Clients who have adopted the crop production method promoted by the project	Number	60000	134423
9	-- female		12000	22959
10	Crop production areas adopted project promoted practice	Hectare	28000	44532
11	Number of livestock waste management facilities constructed	Number	≤200	92
12	Number of project supported pig farms in compliance of performance requirements	Number	≤200	145
13	Number of policy studies completed	Number	11	4
14	Clients days of training provided	Person days	36,000	55828（men-time）
15	-- female	Person days	7,000	22565（men-time）

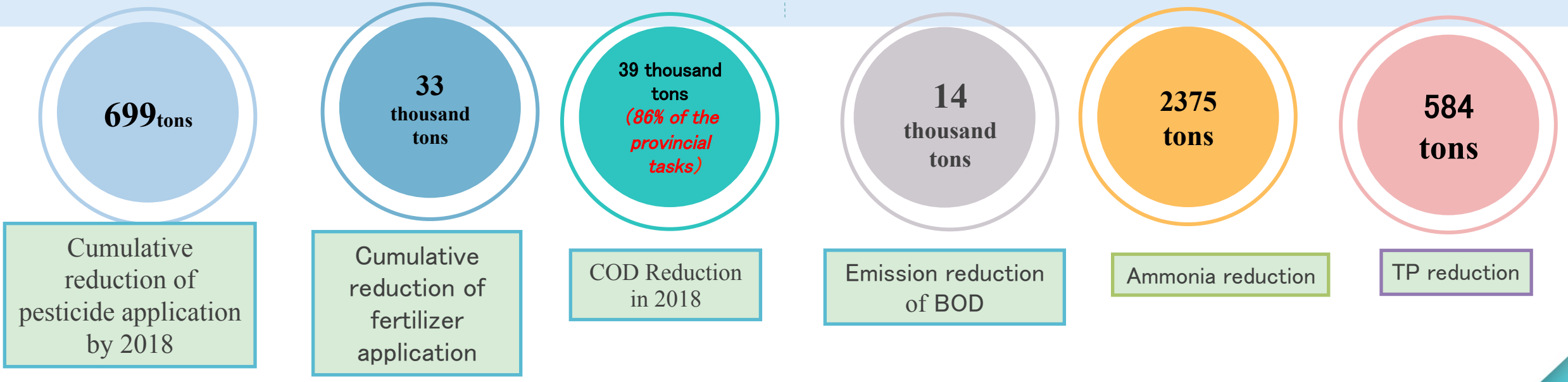
Effectiveness of Emission Reduction and Pollution Control

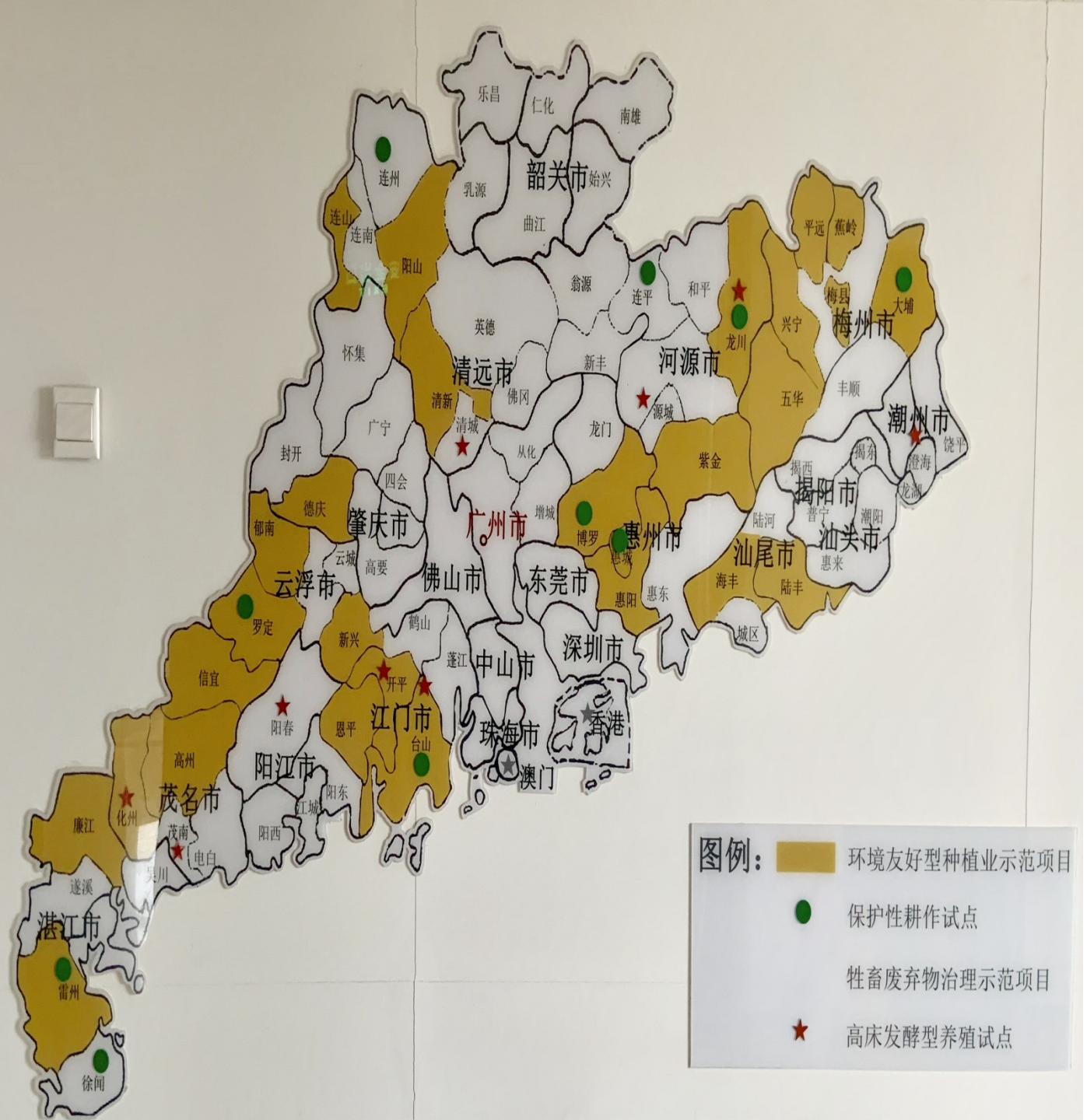
-30.6%

【Fertilizer reducion】

-30.9%

【Pesticide reducion】

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仁化
南雄
韶关市
始兴
连州
乳源
连山
连南
曲江
阳山
翁源
连平
和平
平远
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吴川
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徐闻
图例：
环境友好型种植业示范项目
保护性耕作试点
牲畜废弃物治理示范项目
高床发酵型养殖试点


东江全图
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江西省
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定南
寻乌
水
合河坝
龙川
东源
东
广
省
河源市
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图例
東江時報

The project **achievements have** made significant contribution to the protection **of** water nutrition in Dongjiang River

- **According to the *Report on the Water Quality of Urban Centralized Drinking Water in Prefecture-level Cities of the Whole Province*** issued **by** Guangdong Provincial Department of Ecological Environment in February 2017, water quality levels **of** 5 detection sections (including 3 river-type water sources, 2 lake reservoir-type water sources) **in** Huizhou City are categorized **as** class II water quality, **with a** standard rate of 100%. The water quality of the Dongjiang River has been maintained in the national water quality standard of Class II all the year round.

For the project implementation, pls watch the video. Thank you.