World Bank Project of Guangdong agricultural non-point source pollution control

Social Impact Assessment Report

Owner:  Department of Agriculture of Guangdong Province
Advisory unit:  Urban Management Research Institute of Guangdong

April 2013
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Abstract

This project is the first World Bank loan project for agricultural nonpoint source control in China. It is composed of four components including the environment-friendly farming, livestock waste management, monitoring and evaluation, capacity building and knowledge management. This project aims to enhance the capacity of agricultural nonpoint source pollution control through advanced means of prevention, and reduce the extent of non-point source pollution of water and soil in order to achieve sustainable development of both production and environment.

The project involves three prefecture-level cities, six counties (cities) and 30 towns with thousands of farmers in and hundreds of enterprises (cooperatives). There is a wide range of social impact, and various implementation aspects are closely linked. The key of a success implementation of the project lies in the will and attitude of these participants.

The goal of the social impact assessment is to optimize the overall design and effective implementation of the entire project. Evaluation team investigated with a variety of social survey methods (such as the group discussion, questionnaires, in-depth interviews, site visits and case studies), to identify the stakeholders while monitoring and evaluating a variety of positive and negative social impact during the whole process of project construction. The team also put forward ideas for optimizing project construction and implementation of the program in a timely manner to ensure the stakeholders’ right to know and participate effectively, and avoid social risks of the construction project.

This report is divided into 10 parts. The first part is introduction which provides an overview of the project and the accordance, purpose, content, and analysis methods of the social impact assessment report. The second part is to identify the role of various stakeholders in the project. The third to sixth part is to analyze the current situation, problems, the stakeholders’ awareness and demand, the processes and mechanisms of the implementation as well as risk and countermeasures of the four sub-projects. These sub-projects include: reduced fertilizer pollution control, pesticide reduction pollution control, livestock waste management and conservation tillage. And these four parts also analysis. The seventh part focuses on the role of women’s
groups in the project. The eighth and ninth part provides countermeasure for the expected benefits and risk of the project. The last part of the report provides ideas for the design and implementation of the project.

The main conclusions of the report are as follows: 1) farmers and organizations generally support this project and hold welcome attitude. They hope the project can help improve their technical level, reduce costs and increase revenue. While environmental protection concern is put on the secondary position and there is need to increase promotional efforts. 2) farmers focus on the economic benefits of the project and are more sensitive to the potential cost increase. There is need to provide subsidies to mobilize the enthusiasm of these participants to use the proposed products of this project. 3) the different stakeholders including grower, retail, cooperatives and companies hold different mode of production and use habits of chemical fertilizer and pesticide, thus they should be treat differently in the technology support programs and subsidy programs. 4) farmers generally concerned about the fairness of the project and hope that the project will be conducted in an open, fair, and transparent manner. 5) the bottom-up participatory rural research methods, which helps the farmers to speak their opinion, complemented the shortcoming of the top-down design of the project and enables the project to be more operational and practical. 6) the implementation of the project need to pay special attention to the issues of women's gender and the vulnerability of small farmers, and develop special training programs for women and small farmers to meet their needs. 7) it have been identified that for the towns in the first sub-project, and the 150 farms in the second sub-project, there is no aboriginal issues, based on currently available information, there will be no resettlement issue related to aborigines.
Part 1: Summary

1.1 Project overview

1.1.1 Project background

Since the reform and opening up, China's economic rapid development increased the degree of development and utilization of water resources, however, water environment protection and repair work is relatively slow, the water environmental issues have become increasingly prominent. Data indicate that agricultural non-point source pollution is the major pollution sources of water environment in China.

Guangdong Province is a major economic and agricultural province, but in recent years, with the increase in population and the rapid development of the rural economy, agricultural nonpoint source pollution situation became very grim. It is not only a serious threat to the ecological environment security, which restricts the efficiency of agriculture, but also a threat to human health. After calculation, the province's agricultural COD contributes for 40% of the province's total pollutant emissions, ammonia emissions account for 42% of the province's total emissions. Agricultural nonpoint source pollution has been directly restricting the sustainable social and economic development of Guangdong. Therefore, agricultural nonpoint source pollution control has great significance in both promoting the agricultural structure adjustment of Guangdong and improving production conditions as well as the agricultural ecological environment in rural areas.

1.1.2 Project purposes

This project is China's first World Bank loan project in agricultural nonpoint source pollution control. Its goal is to systematically reduce the extent of non-point source pollution of water and soil through comprehensive prevention and control means and to promote the establishment of agricultural nonpoint pollution control system through capacity-building, knowledge management, monitoring and evaluation. Ultimately, Guangdong residents can enjoy economic, social and ecological benefits from agricultural non-point source pollution control, thus the overall well-being is enhanced.
1.1.3 Project construction content and scale

There are four sub-projects in this World Bank Project of Guangdong agricultural non-point pollution control: (1) environmental-friendly farming; (2) livestock waste management; (3) monitoring and evaluation, capacity building and knowledge management; (4) project management. The first sub-project includes the following three projects: reduced fertilizer and pollution control project, pesticide reduction project and conservation tillage project. The project implementation period is five years, from January 2014 to December 2018.

### Table 1-1 List of project construction content and scale

<table>
<thead>
<tr>
<th>Name of sub-project</th>
<th>construction content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sub-project 1. environmental-friendly farming</strong></td>
<td>1.1 Reduced fertilizer and pollution control project: The promotion and application programs are proposed for formula fertilizer, slow / controlled release fertilizer, integrated water and fertilizer, and rice control technology. And related public support for the proposal is configured.</td>
</tr>
<tr>
<td></td>
<td>1.2 Pesticide reduction project: Comprehensive crop pests prevention and control for the main product of the project area including rice, corn, vegetables, litchi, banana and potato; after the implementation of the project, those agricultural products will be awarded a pollution-free green certification, the provincial funds will be awarded.</td>
</tr>
<tr>
<td></td>
<td>1.3 Conservation tillage project: Choose rice and corn crops for the pilot test. Among which are two Rice Conservation Tillage pilot (1 in Huizhou and 1 in Jiangmen) and two maize conservation tillage Pilot (1 in Huizhou and 1 in Heyuan)</td>
</tr>
<tr>
<td><strong>Sub-project 2. livestock waste management</strong></td>
<td>2.1 <strong>Environmental friendly energy</strong>: Biogas systems and sewage purification projects in a total of 50 farms.</td>
</tr>
<tr>
<td></td>
<td>2.2 <strong>Ecological energy</strong>: Biogas systems and sewage purification projects in a total of 100 farms.</td>
</tr>
<tr>
<td></td>
<td>2.3 <strong>New technology example</strong>: The high bed fermentation ecological farming technology demonstration</td>
</tr>
<tr>
<td><strong>Sub-project 3. monitoring and evaluation, capacity</strong></td>
<td>3.1 <strong>Monitoring and evaluation</strong>: Propose method for daily monitoring and result evaluation for the following fields: the progress and effectiveness of the project; the security policy enforcement, etc.</td>
</tr>
</tbody>
</table>
This project is mainly implemented in Huizhou and Jiangmen. The demonstration project of fertilizer and pesticide pollution control is mainly implemented in 30 towns and six counties in these two cities with a total farmland area of 50 million mu. At the first year, there will be the first implementation of six key townships (see Annex VI: Research report about the sites of project implementation at the first year). The demonstration project of livestock and poultry farms waste pollution control will be implemented in 150 large-scale farms, among which most from Huizhou, Jiangmen and Heyuan (including 30 of the first phase).

Table 1-2 Guangdong agricultural non-point source pollution control project site

<table>
<thead>
<tr>
<th>City</th>
<th>District</th>
<th>Town</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huizhou</td>
<td>Huicheng</td>
<td>Ruhu, Luzhou, Hengli, Ma’an, Shuikou Street</td>
</tr>
<tr>
<td></td>
<td>Huiyang</td>
<td>Pingtan, Liangjing, Yonghu, Shatian, Zhenlong</td>
</tr>
<tr>
<td></td>
<td>Boluo</td>
<td>Shiwan, Futian, Changning, Yangcun, Longhua</td>
</tr>
<tr>
<td>Jiangmen</td>
<td>Taishan</td>
<td>Chonglv, Doushan, Duhu, Chixi, Haiyan</td>
</tr>
<tr>
<td></td>
<td>Kaiping</td>
<td>Cangcheng, Chishui, Longsheng, Magang, Dasha</td>
</tr>
<tr>
<td></td>
<td>Enping</td>
<td>Encheng Street, Naji, Niuijiang, Shahu, Liangxi</td>
</tr>
</tbody>
</table>

150 large scale farms in the province including 30 in the two cities above and Heyuan

1.2. Condition of social assessment
1.2.1 Basis for preparing Social Impact Assessment Report

During the process of the preparation of the report, the following references were
made including the World Bank regulations, China's relevant laws and regulations, industry regulations, and project information. As shown in Table 1-3.

Table 1-3 Basis for Social Impact Assessment Report

<table>
<thead>
<tr>
<th>Category</th>
<th>Name</th>
<th>Promulgation and implementation time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>World Bank loan project resettlement monitoring and evaluation business guide (draft)</td>
<td>June 2000</td>
</tr>
<tr>
<td></td>
<td>&quot;Environmental Protection Law of the People's Republic of China&quot;</td>
<td>December 1989</td>
</tr>
<tr>
<td></td>
<td>&quot;Water Pollution Prevention Law of the People's Republic of China&quot;</td>
<td>February 2008</td>
</tr>
<tr>
<td></td>
<td>&quot;Solid Waste Pollution Prevention Law of the People's Republic of China&quot;</td>
<td>April 2005</td>
</tr>
<tr>
<td></td>
<td>The People's Republic of China Women's Rights Protection Act &quot;</td>
<td>October 1992</td>
</tr>
<tr>
<td></td>
<td>&quot;Organization Law of Villagers'</td>
<td>November 1998</td>
</tr>
<tr>
<td>Related projects</td>
<td>Memorandum of identification group of Guangdong agricultural nonpoint source pollution control projects (P127775/P127815)</td>
<td>March 19th – March 30th 2012</td>
</tr>
<tr>
<td></td>
<td>Memorandum of technology investigation group of Guangdong agricultural nonpoint source pollution control projects (P127775/P127815)</td>
<td>June 2012</td>
</tr>
<tr>
<td></td>
<td>Notice about energy reduction program for “twelfth five-year” from State Council</td>
<td>Guofa（2011）26</td>
</tr>
<tr>
<td></td>
<td>&quot;Instruction inquire about World Bank loan project in 2012-2014 fiscal year &quot;</td>
<td>Fagaiwaizi（20118）1915</td>
</tr>
</tbody>
</table>
### 1.2.2 The purpose and content of the social impact assessment

The goal of the social impact assessment is to optimize the overall design and effective implementation of the entire project. Evaluation team investigated to identify the stakeholders while monitoring and evaluating a variety of positive and negative social impact during the whole process of project construction. The team also put forward ideas for optimizing project construction and implementation of the program.
in a timely manner to ensure the stakeholders' right to know and participate effectively, and avoid social risks of the construction project.

The social impact assessment focuses on the main body of implementation (farmers). By conducting investigation among four major stakeholders (project organization managers, main body project implementation, main body of technical support and other related public participant) (see Table 2), we found that the willingness to participate in the project is the key of a success implementation. In addition, during the interviews for stakeholders, vulnerable groups, such as women and poor groups were given special attention.

Based on the opinion of local residents, the investigation team would put forward views and suggestions on implementation of the project as socio-economic technological support for the project, which includes the following two parts: (1) the project design recommendations; (2) the organizing ability of project affected area. The team would formulate “Community Implementation Manual ”(see Annex VII.), which is to ensure the full participation of stakeholders in the construction of the project, help them to be able to benefit from the project, as well as merging with other development opportunities.

1.2.3 Social impact assessment method

Based the objectives above, the social evaluation team uses different methods including: data analysis, site survey, a random sample survey, the follow-up survey, to convene a village meeting, open semi-structured interviews, stakeholder interviews, matrix analysis method to collect information on production and living conditions in the project impact area, statistics, analyzes and other methods for evaluation. These methods ensure the participation of different stakeholders and farmers under the principle of voluntariness and equality. In the whole project area, promotion in forms of questionnaire, bulletins, conferences and meetings was made for the relevant government departments, villages as well as farmers, so that as much people as possible was able to understand the purpose, content and operational procedures of the project to ensure the smooth implementation of the project. (Detailed work method programs see Annex 1)
1.2.4 Technology routes and Analysis framework (please find the EN Version at Annex II)

1.3 Socio-economic situation

1.3.1 Economic development condition in Project area

(1) Huizhou (Huicheng District, Huiyang District, Boluo Town)

Huizhou City has three project districts. Huizhou has a GDP (GDP) of 2097.3
billion yuan in 2011, and 67.27 billion yuan of total fiscal income, urban per capital disposable income is 26,609 yuan, rural per capital net income is 10,938 yuan. The conditions of project area is shown in Table 1-4 and Table 1-5. From the economic point of view, the project area is in good shape of economic growth and has a relatively high growth rate of GDP and per capita income.

Table 1-4 The national economy and income indicators of project area in Huizhou (2011)

<table>
<thead>
<tr>
<th>Town and its location</th>
<th>Gross Regional Product (One hundred million yuan)</th>
<th>Growth rate %</th>
<th>Fiscal general budget revenue (One hundred million yuan)</th>
<th>Growth rate %</th>
<th>Rural net income per capital (Yuan)</th>
<th>Growth rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huizhou</td>
<td>2097.3</td>
<td>14.6</td>
<td>162.8</td>
<td>31.3</td>
<td>10938</td>
<td>20.5%</td>
</tr>
<tr>
<td>Huicheng District</td>
<td>405</td>
<td>14.5</td>
<td>83.77</td>
<td>30.2</td>
<td>12056</td>
<td>20.9</td>
</tr>
<tr>
<td>Huiyang District</td>
<td>217.05</td>
<td>16.5</td>
<td>18.10</td>
<td>30.2</td>
<td>12660</td>
<td>16%</td>
</tr>
<tr>
<td>Luobo Town</td>
<td>354.43</td>
<td>16.8</td>
<td>18.36</td>
<td>28.6</td>
<td>9065*</td>
<td></td>
</tr>
</tbody>
</table>

Source: national economy and social statistical bulletin. * 2010 data

Table 1-5 Huizhou City project town (street) development indicators of the national economy (2010)

<table>
<thead>
<tr>
<th>Town and its location</th>
<th>Gross industrial production (Ten thousand yuan)</th>
<th>Gross agricultural production (Ten thousand yuan)</th>
<th>Total fiscal revenue (Ten thousand yuan)</th>
<th>Actual arable land area (mu)</th>
<th>Crops sown area (mu)</th>
<th>Consumption of Chemical Fertilizers (ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huicheng District in Ruhe Town</td>
<td>308867</td>
<td>40468</td>
<td>7749</td>
<td>47312</td>
<td>98963</td>
<td>3439</td>
</tr>
<tr>
<td>Huizhou</td>
<td>12027</td>
<td>15913</td>
<td>4652</td>
<td>33000</td>
<td>58172</td>
<td>1428</td>
</tr>
<tr>
<td>Town</td>
<td>Hengli Town</td>
<td>Ma’an Town</td>
<td>Shuikou Street</td>
<td>Pingtan Town</td>
<td>Liangjingtang Town</td>
<td>Yonghu Town</td>
</tr>
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<td>---------------------</td>
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<td>----------------</td>
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<td>---------------------</td>
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</tr>
<tr>
<td></td>
<td>64144</td>
<td>183659</td>
<td>1128525</td>
<td>70993</td>
<td>59156</td>
<td>118370</td>
</tr>
<tr>
<td></td>
<td>53454</td>
<td>23550</td>
<td>27280</td>
<td>44002</td>
<td>21423</td>
<td>21748</td>
</tr>
<tr>
<td></td>
<td>7393</td>
<td>2910</td>
<td>3200</td>
<td>1669</td>
<td>791</td>
<td>2456</td>
</tr>
<tr>
<td></td>
<td>86250</td>
<td>22150</td>
<td>26547</td>
<td>45316</td>
<td>35200</td>
<td>29000</td>
</tr>
<tr>
<td></td>
<td>148196</td>
<td>42765</td>
<td>80608</td>
<td>113192</td>
<td>67254</td>
<td>56278</td>
</tr>
<tr>
<td></td>
<td>2992</td>
<td>1318</td>
<td>1552</td>
<td>909</td>
<td>996</td>
<td>1739</td>
</tr>
</tbody>
</table>

Source: Huizhou Statistical Yearbook 2011 the municipalities reported from baseline survey
As can be seen from the chart below, for the majority of the towns, there is a linear positive correlation of gross agricultural production and fertilizer use.

![Diagram of Huizhou City project town agricultural GDP and Chemical Fertilizers](image)

**Figure: Diagram of Huizhou City project town agricultural GDP and Chemical Fertilizers**

(2) **Jiangmen City (Taishan City, Enping City, Kaiping City)**

Jiangmen City also has three project towns. In 2011, Gross Regional Product (GDP) is 1830.64 billion yuan, it is an increase of 13.0% compared to the previous year; annual tax revenue is 27.633 billion yuan, disposable income per urban capita was 23,924 yuan, it is an increase of 13.1% compared to the previous year. The net income per rural capita was 9,996 yuan, it is an increase of 16.4% compared to the previous year. Conditions of project area are shown in Table 1-6 and Table 1-7.

**Table 1-6 The national economy and income indicators of project area in Jiangmen (2011)**

<table>
<thead>
<tr>
<th></th>
<th>Gross Regional Product (One hundred million yuan)</th>
<th>Growth rate %</th>
<th>Fiscal general budget revenue (One hundred million yuan)</th>
<th>Growth rate %</th>
<th>Rural net income per capital (Yuan)</th>
<th>Growth rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jiangmen City</td>
<td>1830.64</td>
<td>13.0</td>
<td>119.17</td>
<td>20.5</td>
<td>9996</td>
<td>16.4</td>
</tr>
<tr>
<td>Town and its location</td>
<td>Gross industrial production (Ten thousand yuan)</td>
<td>Gross agricultural production (Ten thousand yuan)</td>
<td>Total fiscal revenue (Ten thousand yuan)</td>
<td>Actual arable land area (mu)</td>
<td>Crops sown area (mu)</td>
<td>Consumption of Chemical Fertilizers (ton)</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>----------------------------------------</td>
<td>-----------------------------</td>
<td>---------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Taishan City in Jiangmen</td>
<td>Chonglou Town</td>
<td>5.58</td>
<td>38776</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Doushan Town</td>
<td>141731</td>
<td>52306</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Duhu Town</td>
<td>105000</td>
<td>26000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chishui Town</td>
<td>33188</td>
<td>37066</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Haiyan Town</td>
<td>79304</td>
<td>1018.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Masheng Town</td>
<td>6149</td>
<td>18.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaiping City in Jiangmen</td>
<td>Cangcheng Town</td>
<td>240.22</td>
<td>14.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chishui Town</td>
<td>29831.5</td>
<td>15.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Masheng Town</td>
<td>29831.5</td>
<td>15.1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The national economy and social statistical bulletin.

**Table 1-7 Jiangmen City project town (street) development indicators of the national economy (2010)**
### Social Impact Assessment Report of World Bank Project

#### 1.3.2 Demographic characteristics of the project area

##### (1) Huizhou City (Boluo Town, Huiyang District, Huiche g District)

By the end of 2011, the population of Huizhou is 4.6336 million people with a population density of 408 persons / sq km. Among which Huicheng District has a population of 1.1745 million, including a registered population of 799.8 thousand
people, of which agricultural population is 286.4 thousand people, accounting for 35.8%. The Huiyang District has a population of 576.8 thousand people, including a registered population of 378.5 thousand, of which agricultural population is 206.1 thousand, accounting for 54.5%. Boluo Town has a population of 1.0465 million, including a registered population of 851.8 thousand, of which agricultural population is 606.1 thousand, accounting for 71.2%. Town population of each project area is showed in the following table.

<table>
<thead>
<tr>
<th>Project location</th>
<th>Total population (person)</th>
<th>Total number of households (household)</th>
<th>Agricultural population (person)</th>
<th>Agricultural population percentage %</th>
<th>Average household population (person)</th>
<th>Minority population (person)</th>
<th>Minority population percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huicheng District in Huizhou</td>
<td>Huiche Henglig Town</td>
<td>48012</td>
<td>12079</td>
<td>45036</td>
<td>93.80</td>
<td>4</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Luzhou Town</td>
<td>25961</td>
<td>5540</td>
<td>24366</td>
<td>93.86</td>
<td>4</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Hengli Town</td>
<td>69726</td>
<td>10762</td>
<td>62000</td>
<td>88.92</td>
<td>6</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Ma’an Town</td>
<td>29535</td>
<td>7098</td>
<td>26333</td>
<td>89.16</td>
<td>4</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Shuiku Street</td>
<td>59463</td>
<td>10927</td>
<td>46398</td>
<td>78.03</td>
<td>4</td>
<td>None</td>
</tr>
<tr>
<td>Huiyang District in Huizhou</td>
<td>Pingtan Town</td>
<td>43921</td>
<td>7834</td>
<td>36000</td>
<td>81.97</td>
<td>5</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Liangjing Town</td>
<td>37633</td>
<td>9072</td>
<td>30093</td>
<td>79.96</td>
<td>3</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Yongh Town</td>
<td>28814</td>
<td>6750</td>
<td>25037</td>
<td>86.89</td>
<td>4</td>
<td>None</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Town</th>
<th>Population</th>
<th>Urban Population</th>
<th>Agricultural Population</th>
<th>Households</th>
<th>Minority</th>
<th>Cost (Yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shatian Town</td>
<td>15443</td>
<td>3096</td>
<td>12000</td>
<td>77.71</td>
<td>None</td>
<td>4</td>
</tr>
<tr>
<td>Zhenglong Town</td>
<td>27889</td>
<td>7754</td>
<td>23899</td>
<td>85.69</td>
<td>None</td>
<td>3</td>
</tr>
<tr>
<td>Boluo Town</td>
<td>51688</td>
<td>9816</td>
<td>44049</td>
<td>85.22</td>
<td>None</td>
<td>4</td>
</tr>
<tr>
<td>Shiwan Town</td>
<td>31892</td>
<td>5518</td>
<td>27995</td>
<td>87.78</td>
<td>None</td>
<td>5</td>
</tr>
<tr>
<td>Futian Town</td>
<td>34401</td>
<td>5833</td>
<td>27962</td>
<td>81.28</td>
<td>None</td>
<td>5</td>
</tr>
<tr>
<td>Changning Town</td>
<td>45041</td>
<td>7215</td>
<td>37038</td>
<td>82.23</td>
<td>None</td>
<td>5</td>
</tr>
<tr>
<td>Yangcun Town</td>
<td>24452</td>
<td>4637</td>
<td>21501</td>
<td>87.93</td>
<td>None</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Huizhou Statistical Yearbook 2011 the municipalities reported from baseline survey data.

From the population data it could be seen that all the 15 towns in Huizhou are agricultural town, the proportion agricultural population basically reached more than 80%, among which two towns reached 93%. Average household agricultural population is about 4, and there is no minority population.

(2) Jiangmen City (Taishan City, Enping City, Kaiping City)

By the end of 2011, the population of Jiangmen is 4.4655 million with registered population of 3.9371 million. Among the total population, urban population is 2.8043 million, rural population is 1.6612 million, accounting 37.2%. Taishan city has a population of 986.6 thousand, including 262.7 thousand non-agricultural population, accounting 26.7%. Kaiping has a population of 690.5 thousand, including a non-agricultural population of 239.971 thousand, accounting 34.75%. Enping has a population of 505.5 thousand. The democratic information for towns is showed in the following table.
<table>
<thead>
<tr>
<th>Project location</th>
<th>Total population (person)</th>
<th>Total number of households (household)</th>
<th>Agricultural population (person)</th>
<th>Agricultural population percentage %</th>
<th>Average household population (person)</th>
<th>Minority population (person)</th>
<th>Minority population percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taishan City in Jiangmen</td>
<td>Chonglu</td>
<td>37900</td>
<td>9177</td>
<td>34467</td>
<td>90.94</td>
<td>4</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Doushan</td>
<td>54000</td>
<td>11764</td>
<td>45816</td>
<td>84.84</td>
<td>4</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Duhu</td>
<td>50400</td>
<td>12654</td>
<td>44888</td>
<td>89.06</td>
<td>4</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Chixi</td>
<td>33100</td>
<td>6845</td>
<td>30861</td>
<td>93.24</td>
<td>5</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Haiyan</td>
<td>83670</td>
<td>21524</td>
<td>80145</td>
<td>95.79</td>
<td>4</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Kaiping City in Jiangmen</td>
<td>Cangcheng</td>
<td>30592</td>
<td>7555</td>
<td>28891</td>
<td>94.44</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chishui</td>
<td>10296</td>
<td>39000</td>
<td>4</td>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Longsheng</td>
<td>8651</td>
<td>35326</td>
<td>4</td>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Magang</td>
<td>54943</td>
<td>13574</td>
<td>53931</td>
<td>98.16</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dasha</td>
<td>33000</td>
<td>7611</td>
<td>31454</td>
<td>95.32</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Enping City in Enchong Street</td>
<td>184018</td>
<td>10316</td>
<td>38729</td>
<td>21.05</td>
<td>4</td>
<td>None</td>
</tr>
</tbody>
</table>
From the population data it could be seen that apart from Encheng Street with an agricultural population of 21%, all the other 14 towns are agricultural town, the proportion of agricultural population has basically reached 85% or more. The average household agricultural population of about four people, the Cangcheng Town in Kaiping City has a minority population of 80.

(3) Heyuan City

By the end of 2011, Heyuan has a residential population of 2.9819 million, the urbanization rate is 40.18%. The total population is 3.6678 million, including non-agricultural population of 820.3 thousand and agricultural population of 2847.5 thousand, accounting for 77.6%. There are five nations in the city, including majority of Han and Minority of She, Zhuang, Miao, etc.

Conclusion:

In summary, the majority of project towns are agricultural towns, about 80% of the total population is agricultural population. There is only a small number of the minority population in the project area, only 80 people in Cangcheng Town, Kaiping, Jiangmeng (the household population), accounting for 0.23% of the town's total population. There are 7 different nations, mainly Zhuang, followed by the Tujia, Li, Yao, Miao, Bai and Buyi. There is no minority village in the project.

1.4 Condition of agricultural non-point source pollution in project area

1.4.1 Basic agriculture condition in project area

(1) Basic agriculture condition in Huizhou

Huizhou has a subtropical monsoon climate with Tropic of Cancer running through the city. The climate is mild with abundant perennial rainfall and plenty of
sunshine. The average annual rainfall is 2000 mm, the average temperature is 22 ° C. Huizhou City has a land area of 11,200 km2, including 2.1218 million mu of arable land. The north part is mainly mountain, central and coastal zones have many small plains, while the east and west areas are mainly hills. One of the three major river systems in Guangdong Province, the East River and West Zhijiang, run through the city. The freshwater reserves amounted to 8.51 billion cubic meters, which is the main water source of Hong Kong, Shenzhen, Dongguan, the level of water supply ranks No.3 among the cities in China. Huizhou has rich production of rice, sugar cane, peanuts, litchi and orange. Huizhou also has rich marine resources, with a 223.6 km long coastline and a 4520 square kilometers sea area, there are more than 640 kinds of aquatic species.

In 2011, the added value of agricultural is 11.77 billion yuan, it is an increase of 5%. Rural per capita net income is 10,938 yuan, it is an increase of 20.5% compared to the previous year, basic indicators of agricultural condition in the project area are as follows.

<table>
<thead>
<tr>
<th>Project area</th>
<th>Total agricultural output (Billion Yuan)</th>
<th>Growth rate %</th>
<th>Agricultural production (ten thousand ton)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Grain</td>
<td>Fruit</td>
</tr>
<tr>
<td>Huizhou</td>
<td></td>
<td>5</td>
<td>60.98</td>
<td>214.55</td>
</tr>
<tr>
<td>Huicheng District</td>
<td>25.5</td>
<td>3.3</td>
<td>8.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Huiyang District</td>
<td>15.36</td>
<td>2.8</td>
<td>4.25</td>
<td>10.67</td>
</tr>
<tr>
<td>Boluo Town</td>
<td>52.5</td>
<td>6.5</td>
<td>16.1</td>
<td>—</td>
</tr>
</tbody>
</table>

Source: National Economic and Social Development Statistics Bulletin, data reported by towns

(2) Basic agriculture condition in Jiangmen
Jiangmen has a subtropical monsoon climate, warm and rainy throughout the year without snow, with an average annual temperature of 22 °C, an average annual rainfall of 2078 mm and an annual average sunshine of 1700 hours. The city is rich in rivers, fertile land and agricultural resources. Jiangmen has a land area of 9541 square kilometers, an arable area of 2.295 million mu accounting for about 1/4 of the Pearl River Delta arable land, but per capita arable land area is only 0.8 acres; the aquaculture area is 1.0128 million mu, accounting for 1/3 of the Pearl River Delta’s aquaculture area; the forestry land is 6.633 million mu, accounting for 1/4 of the Pearl River Delta’s forestry land. Major rivers in Jiangmen City is the Xijiang and Tanjiang, river annual runoff is 11.966 billion cubic meters, the total water resources is 12.08 billion cubic meters, accounting for 6.49% of Guangdong Province’s total water resource. In 2011, the total revenue of the city's rural area, agricultural output value and added value of agriculture is 297.6 billion yuan, 25.422 billion yuan and 13.769 billion yuan, which is a growth of 24%, 4.4% and 4.0%. The per rural capita net income reached 9,996 yuan, it is an increase of 16.4% compared to the previous year and it is the fourth consecutive year for double-digit growth. The basic agricultural status indicators in the project area are as follows.

<table>
<thead>
<tr>
<th>Project area</th>
<th>Total agricultural output (Billion Yuan)</th>
<th>Growth rate %</th>
<th>Net income per rural capita (Yuan)</th>
<th>Agricultural production (ten thousand ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grain</td>
</tr>
<tr>
<td>Jiangmen</td>
<td>254.22</td>
<td>4.4</td>
<td>9996</td>
<td>91.78</td>
</tr>
<tr>
<td>Taishan</td>
<td>28.46</td>
<td>5.9</td>
<td>8760</td>
<td>40</td>
</tr>
<tr>
<td>Kaiping</td>
<td>42.64</td>
<td>3.5</td>
<td>9211</td>
<td>22.20</td>
</tr>
<tr>
<td>Enping</td>
<td>28.05</td>
<td>5.4</td>
<td>6149.18</td>
<td>12.9</td>
</tr>
</tbody>
</table>

Source: National Economic and Social Development Statistics Bulletin

(3) Basic agriculture condition in Heyuan

Heyuan has a subtropical monsoon climate. In 2010 the average annual temperature is 21.0°C, which is 0.5°C higher than usual and the average annual rainfall is 1742.0
mm. The city has a total area of 15,800 km², including 21.1263 million mu of agricultural land. The city is rich in water resources, the average annual runoff is 15.13 billion cubic meters, the city's per capita water resource is 4,500 cubic meters, about 2 times the country and the province's per capita water resources. Agricultural industry develops steadily. In 2011, the output value of agriculture, forestry, animal husbandry and fishery together is 11.987 billion yuan, an increase of 6.5% over the previous year. The process of agricultural industrialization progressed steadily. There are 260 leading agricultural enterprises in the city with the business model of "company + base + farmers". In 2011, there are 40 new enterprises, among which the number of provincial level leading enterprise is 4 and city level leading enterprise is 12. They affected up to 230,000 farmers and increased their income by 2,900 yuan.

<table>
<thead>
<tr>
<th>Project area</th>
<th>Total agricultural output (Billion Yuan)</th>
<th>Growth rate %</th>
<th>Net income per rural capita (Yuan)</th>
<th>Agricultural production (ten thousand ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Grain</td>
</tr>
<tr>
<td>Heyuan</td>
<td>119.87</td>
<td>6.5</td>
<td>6734</td>
<td>90.98</td>
</tr>
</tbody>
</table>

Source: Heyuan Economic and Social Development Statistics Bulletin 2011

1.4.2 Condition of agricultural non-point pollution in project area

(1) Agricultural non-point pollution condition in Huizhou

The agricultural pollution situation in Huizhou City is grim, average fertilizer utilization rate is about 32%, the pesticide utilization rate is about 30%, with a huge loss of chemical fertilizers and pesticides by agricultural runoff into rivers, causing eutrophication. In addition, less than 20% of the discharge in large-scale farms reached the standards in the city. In Huiyang District and Huicheng District, the percentage of discharge what reached the standards is 0, such discharge without proper modification process of animal manure and other pollutants has caused pollution to the surrounding agricultural area (water pollution) and threatens the healthy living of resident (air pollution and contamination of drinking water). It has become an important environmental issue which cannot be ignored.
Table 1-13 Status indicators of agricultural nonpoint source pollution in Huizhou City (2011)

<table>
<thead>
<tr>
<th>Project area</th>
<th>Pollution Situation of farming</th>
<th>Pollution Situation of breeding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fertilizer utilization quantity and rate</td>
<td>Pesticide</td>
</tr>
<tr>
<td></td>
<td>Nitrogen (ton, %)</td>
<td>Phosphorus (ton, %)</td>
</tr>
<tr>
<td>Huizhou</td>
<td>104520 (35.1)</td>
<td>49153 (16.1)</td>
</tr>
<tr>
<td>Hhuicheng District</td>
<td>10915 (28.2)</td>
<td>8611 (20.2)</td>
</tr>
<tr>
<td>Huiyang District</td>
<td>10400(36)</td>
<td>6900 (22)</td>
</tr>
<tr>
<td>Boluo Town</td>
<td>37870(35)</td>
<td>39465(20)</td>
</tr>
</tbody>
</table>

Source: Huizhou baseline survey data

(2) Agricultural non-point pollution condition in Jiangmen

The agricultural nonpoint source pollution in Jiangmen is more serious, the major pollutants come from farming and breeding, mainly includes livestock and poultry industry waste and crop straw, fertilizers, pesticides and other agricultural inputs. In 2011, the city's fertilizer unit application rate is 53 kg / mu (above the level of the province's 51 kg / mu), the amount of pesticides is also higher than the provincial average. 2011 Urban agricultural plastic film utilize amount is 4543 tons. Some plastic film decomposed into toxic substances and contaminated the soil, changing the soil’s physical and chemical properties. In addition, in 2011, the emissions of livestock and poultry feces up to 5.93 million tons, the comprehensive utilization rate is only 64.6%, about 1/3 of the livestock and poultry manure was direct emissions, this is one of the most important reasons for air pollution and
eutrophication.

**Table 1-14 Status indicators of agricultural nonpoint source pollution in Jiangmen City (2011)**

<table>
<thead>
<tr>
<th>Project area</th>
<th>Fertilizer utilization quantity and rate</th>
<th>Pesticide</th>
<th>Pollution Situation of breeding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nitrogen (ton, %)</td>
<td>Phosphorus (ton, %)</td>
<td>Potassium (ton, %)</td>
</tr>
<tr>
<td>Jiangmen</td>
<td>142723</td>
<td>69016</td>
<td>44222</td>
</tr>
<tr>
<td>Taishan</td>
<td>44700</td>
<td>21050</td>
<td>11454</td>
</tr>
<tr>
<td>Kaiping</td>
<td>30585</td>
<td>15076</td>
<td>11740</td>
</tr>
<tr>
<td>Enping</td>
<td>18934</td>
<td>10769</td>
<td>6624</td>
</tr>
</tbody>
</table>

Source: Jiangmen baseline survey data

(3) **Agricultural non-point pollution condition in Heyuan**

Currently the problem of agricultural non-point source pollution, livestock pollution and industry production has become increasingly prominent in Heyuan. The city is highly concerned about the livestock pollution prevention and control, and insists on the scientific planning and development of livestock breeding according to relevant rules and regulations. The city has strict standard for environmental access and promotes ecological farming. In 2010, special law enforcement inspection was carried out in fields of livestock and poultry breeding, this effectively curbed illegal breeding and sewage disposal, effectively strengthened the standardized management of farming and breeding enterprises, and established a number of ecological farming demonstration farms to promote healthy livestock poultry breeding industry and sustainable development.
1.5 Basic social economic condition of sample town

Taking into account the diverse level of economic and social development, agricultural development, characteristics and other factors, the evaluation team decided to take a sample survey method, to choose a representative of the township as a sample, and investigate through home interviews with farmers, field trips and other methods, and conduct a thorough study of the population, social and economic developments and relevant information of the sample town. Chonglou Town in Taishan was chosen to represent in the project area.

Chonglou Town has an arable land area of 38.6 thousand mu and a farming system of three crops a year. In 2011, the town’s early agricultural production includes 29 thousand mu of rice, 7.3 thousand mu of melon, 2.259 thousand mu of vegetables. The agricultural output value is 55.8 thousand yuan, the average annual income of farmers is 6.358 thousand yuan. The production organization is individual based.

Table 1-15 Utilization condition of fertilizer per crop of agricultural production in Chonglou Town

<table>
<thead>
<tr>
<th>Nitrogen fertilizer</th>
<th>Phosphate fertilizer</th>
<th>Potash fertilizer</th>
<th>Manure fertilizer</th>
<th>Pesticides (low toxicity)</th>
<th>Plastic sheeting</th>
<th>Plastic Mulch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity (ton)</td>
<td>377.9</td>
<td>115.7</td>
<td>343.2</td>
<td>7720</td>
<td>7720kg</td>
<td>250</td>
</tr>
<tr>
<td>Quantity per mu (kg)</td>
<td>9.8</td>
<td>3</td>
<td>8.9</td>
<td>200</td>
<td>200g</td>
<td>65</td>
</tr>
</tbody>
</table>

Table 1-16 Breeding condition in Chonglou Town

<table>
<thead>
<tr>
<th>Breed</th>
<th>Quantity (Ten thousand)</th>
<th>Breeding stock (Ten thousand)</th>
<th>Manure per day (ton)</th>
<th>Manure handling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pig</td>
<td>3.6</td>
<td>1.2</td>
<td>12</td>
<td>After retting maturity, manure is mainly used for base fertilizer and sometimes used for top dressing. Also it could be used as feeds at pond</td>
</tr>
<tr>
<td>Chicken</td>
<td>36</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
The opinions of the public mainly including the following three points:

First, livestock manure that was used as fertilizer in scattered manner would cause the field to stink and attract flies in the village. They wish to have a centralized high-temperature treatment for manure before the fertilizer is sold.

Second, livestock manure should be purified before emission in every farm in order to solve the pollution problem.

Third, in order to control the use of pesticides and fertilizers, training in modern agricultural science and technology, promotion of long-term low-toxicity pesticides and controlled-release fertilizers, and reduction of agriculture fertilizer application are needed.
Part 2 Project understanding and demand of stakeholders

This chapter analyzes all the related stakeholders in the project. Because this is an agricultural nonpoint source pollution control and technology application project, its operation will inevitably involve different people, therefore a clear framework of stakeholders must be identified. According to the analysis, direct stakeholders includes: farmers, village-level organizations, township fertilizer station, township animal husbandry station, women, and the indirect stakeholders includes: Agriculture Department of Guangdong Province, the project town (cities, districts ) governments and its subordinate government agencies. Their role would be pre-defined by investigation team.

According to project investigation, the related stakeholders are shown in the following figure 2-1
Stakeholders of the project

Project organizer

Project implementation main body

Project technical support main body

Other public participants

- Farmer
- Breeding farner
- Cooperative
- Provincial agriculture department
- City agriculture department
- County agriculture department
- Town agriculture department
- Village committee
- Supplier
- Minority
- Nearby resident
- Enterprise
- Cooperative union
- Professional cooperatives
- Big scale
- Small scale
- Female
- Minority
- Nearby resident
- Media
- Provincial Joint Conference Office
- Provincial department
- City department
- County department
- Town department
- Village
- Cooperative
- Supplier
- Industry Association
- Provincial expert group
- Research Institute
- Agricultural Technology Promotion Center
- The fertilizer pollution control group
- The pesticide pollution control group
- Livestock breeding pollution control group

Social Impact Assessment Report of World Bank Project
2.1 Grower

The growers are the main body of agricultural non-point source pollution control project and direct implementers of the project, they are also the largest victims or beneficiaries of the agricultural non-point source pollution control project.

During the process of social assessment, investigation group conduct careful survey visits and issued questionnaire for growers, farmers and enterprises. The first diagnostic questionnaire issued a total of 1,500 questionnaires, 50 questionnaires per town, questionnaires in 15 towns were recollected (1,000 copies), including 850 valid questionnaires accounting 66.67%. The following result is based on the first large-scale research:

2.1.1 Basic condition

According to the questionnaires, it could be found that most of the farmers in the project area are locals, and the family's major income source is growing. The income level is basically 10-20 thousand per year, which is relatively low

◆ Population structure:

Main labor force is middle-ages of 40-50 years old. According to the survey, in some towns most young people went out to work, there is the "hollowing out" phenomenon in rural areas. However, recently there is also a trend of rural labor reflux.

◆ Income source:

The major income source for growers is farming. According to the survey, 56.08% of the farmers’ major income resource is farming.

◆ Technology acquisition:

According to the survey, only about 34.14% of the growers had involved in agricultural extension services and training on pesticides, fertilizers, soil testing, pest control and fertilizer formulation technology while 65.86 percent of the farmers have not participated in any related training, and their main source of technology is showed below.

The major method to acquire farming technology is independent learning, only 19.47% of the survey population participated in related training courses provided by government. Therefore, diverse training programs should be designed in the project to
meet the need of farmers of different learning habit.

◆ **Opinions about pollution:**

According to the questionnaire, most farmers are aware of the water pollution, while about 30% of farmers responded “I don’t know”. The awareness of pollution, its pathways and hazards would influence the participation of the program. Therefore, more promotion among the farmers about the project is needed.

2.1.2 Large scale grower

The grower is an important part of the project promotion. Growers of certain scale have stronger ability and more enthusiasm to accept new technology involved in the project, Therefore, by promoting among these entrepreneurial growers or retail growers, the implementation of project can be made easy.

2.1.3 Retail growers

Generally speaking, growers are more enthusiastic about the project. But they are still reluctant to accept the new technologies. According to the survey, this is because most retail growers are older in age and have smaller growing area, so they are not sensitive to growing cost change of 10%-20%. Because the project has only a limited influence on them, they are not very enthusiastic about the project.

2.1.4 Entrepreneurial growers

Because the enterprises have more funds and machines, they are more motivated to accept new technologies and thus more involved in the project. The large scale growers are the key target of the promotion and training program, and this would help to achieve better implementation of the project.

2.2 Organization managers

Local government departments, such as the departments of counties, towns, villages, are the initiator and organizer of this agricultural non-point source pollution control project, they have a larger role and guiding force in governance the early stage and the entire process of the project, the quality of decision-making and governance would determine the method and direction of the project, and its ability to regulate and control the socio-economic environment often determines the final effects of the
project.

◆ Agricultural department of Guangdong

Department of Agriculture of Guangdong acts as a macro guidance and policy managers to participate in the World Bank project, it is the project coordinator between the project, the company and the farmers. It will oversee the World Bank agricultural non-point source pollution control project and take the responsibility to ensure repayment obligations.

◆ Agricultural department and bureau of towns

As the major organizer in town level, Department of Agriculture in each town is directly in charge of the operation of the project. Generally, the department would involve in the project as a coordinator between the project and farmers. And they are also the main stakeholder of the project. Among the 30 towns involved in the project, two towns have previous experience of related agricultural promotion World Bank project. These departments have accumulated certain experience in the project operation. The service center of town would act as a bridge between government and villagers, agriculture department and villagers and between the different villagers.

◆ Current problem

According to the survey, the governments are very concerned about the project. Due to the enthusiasm of the towns, towns began to compete with each other. They regard better environment as the biggest effect of the project. However we also know from the interview that in the process of promoting the project, the government has various difficulties including: 1) lack of experience. Because this world bank project is the first agricultural non-point pollution control project in China, there is no previous example to learn from. Experience about operation and technological routes is lacking; 2) lack of technology experts. Take Enping as an example, although Enping is a major agriculture city, the number of agricultural experts is far from enough and it makes the implementation of project very hard 3) the agriculture environment monitoring system is not perfect.; 4) the environmental protection ability in terms of both facility and labor resource need to be improved 4) people’s understanding of project need to be improved.; 5) Some farmers and agriculture organization has vague understanding of the significance of the project, and this has negative impact on the project. 5) difficulty in promoting new technology. Firstly, there is aging problem
among farmers in some of the towns, for example, according to the report of Enping, the ability to accept new technology need to be improved. Secondly, the scattered mode of farming operation increased the difficulty of the implementation of the project.

2.3 Technological support main body

Expert Group experts such as fertilizer station, livestock station are the major technical guidance in project preparation, and also the main collaborating institutions of the implementation of project. In this project, the provincial project expert group provides project planning and technical guidance; while provincial fertilizer pollution control group, pesticide reduction control group, livestock and poultry pollution control group, project consulting and management experts takes responsibility in fertilizer pollution control projects, the pesticide reduction control harmful projects and large-scale farms biogas projects and project consulting and management. They are also responsible for daily technical guidance, project implementation progress control and report implementation summary of the project.

![Project management and technical support organization](image)

**Figure 2-2:** Project management and technical support organization
2.4 Understanding and demand of project

60.54% of the farmers know about the project, but they are not familiar with the detail of implementation of the project. About 82.88% of the farmers including enterprise, minority, female are willing to participate in the project, and believe the project would not have negative impact on their family.

The farmers focus on the economic benefit of the project, and they are sensitive to increased cost. They hope to participate the project without a decrease in crop production and income. 49% of the farmers believe the project would help increase their income and life quality while 39% of the farmers believe the project can effectively control the non-point source pollution in their village. This is also the anticipation of the farmers to the project. Most farmers realized the benefit of the project after they understand the project and they are willing to participate in the project.

![Figure 2-3: response to “In your opinion, what is the effect of the project?”]

A. increasing income and upgrading living standard-49%  B. promoting farm productivity-29%  C. generating good agricultural brand effect-24%  D. controlling ANP and improving rural eco-environment-39%  E. reducing diseases and epidemics- 28%  F. creating job opportunities and improving social security-1%

- **Enterprise farmer:** The entrepreneurial farmers have enthusiasm to involve in the project, and hold expectations of improving the technology and reducing costs.
- **Large scale farmer:** 2/3 of the farmers are not familiar with the project. After the interview, most of them are willing to participate in the project. 10% of the farmers
don’t know how to participate. Their expectation of projects includes the followings: the first is to increase production and income, the second is to improve technology such as fertilizer and pesticide

- **Retail farmer:** Most of the farmers are not familiar with the project. After the interview, most of them are willing to participate in the project. 10% of the farmers don’t know how to participate. Their expectation of projects includes the followings: the first is to increase production and income, the second is to improve technology such as fertilizer and pesticide

- **Farmer cooperatives:** Farmer cooperatives are enthusiastic about the project and their expectation for the project is to increase income, reduce cost and increase subsidy.

- **Supplier:** The effect of promotion is not satisfactory. Agricultural fund company competes with formulate fertilizer test pilot. The main purpose of the agriculture company is to make profit, and the application of formula fertilizer would affect its sales of fertilizer and income.
Part 3 Fertilizer Reduction and Pollution control

3.1 Involved social groups

3.2 Current condition and analysis

3.2.1 Current fertilizing practice

(1) Fertilizing practice in different subject

Individual planters generally use the same type of composite fertilizer. Cooperatives use less fertilizer in quantity than the other two groups. Cooperatives discusses on fertilizer purchases before ordering, which is more standardized.

Table 3-1: Comparison of fertilizing practice in rice planting for subject groups

<table>
<thead>
<tr>
<th>Fertilizer Information</th>
<th>Major Grower</th>
<th>Individual Grower</th>
<th>Cooperatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types</td>
<td>Composite</td>
<td>Urea, composite</td>
<td>Composite, manure</td>
</tr>
<tr>
<td>Num. of uses</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Quantity: 57.5 kg/Mu
Urea: 20 kg/Mu
Composite 32.5 kg/Mu
Nitrogen 10 kg/Mu
Composite + manure 32.5 kg/Mu

<table>
<thead>
<tr>
<th>Purchase from</th>
<th>Farm material supplier</th>
<th>Farm material supplier</th>
<th>Unified purchases by committee</th>
</tr>
</thead>
</table>

| Applied by   | Hired workers          | Self                  | Hired workers                |

(2) Usage in Different Planting System

Table 3-2: Comparison of usage in Different Planting System

<table>
<thead>
<tr>
<th>Planting System</th>
<th>Types and Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Niujiang, Enping</strong></td>
<td>- General types: urea, composite fertilizer</td>
</tr>
<tr>
<td>(Rice-rice-sweet potatoes)</td>
<td>- Urea is 2.4 yuan/kg; composite fertilizer is 3.4 yuan/kg</td>
</tr>
<tr>
<td></td>
<td>- Each Mu uses urea 19.5kg, costs 46.8 Yuan,</td>
</tr>
<tr>
<td></td>
<td>- Each Mu uses composite fertilizer 35 kg, costs 119 Yuan, Total 166 Yuan/Mu each use.</td>
</tr>
<tr>
<td></td>
<td>- Large planters use 8-10 kg less urea and composite fertilizer than small planters.</td>
</tr>
<tr>
<td><strong>Hengli, Huizhou</strong></td>
<td>- General types: urea and composite fertilizer; some phosphorous and potassium</td>
</tr>
<tr>
<td>(Rice-rice-Vegetable)</td>
<td>- Urea is 2.4 Yuan/kg; composite fertilizer is 3.4 Yuan/kg or 3.6 Yuan/kg</td>
</tr>
<tr>
<td></td>
<td>- Each Mu uses urea around 15kg each season; costs 36.18 Yuan;</td>
</tr>
<tr>
<td></td>
<td>- Each Mu uses composite fertilizer 41 kg each season; costs 134.6 Yuan</td>
</tr>
<tr>
<td></td>
<td>- Each Mu uses potassium fertilizer 16kg each season; costs 57.6 Yuan</td>
</tr>
<tr>
<td><strong>Hengli, Huizhou</strong></td>
<td>- General types: urea, composite fertilizer, some potassium fertilizer with</td>
</tr>
<tr>
<td>(Rice-rice)</td>
<td>small ratio</td>
</tr>
<tr>
<td></td>
<td>- Urea cost 2.4 Yuan/kg; composite fertilizer 3.3 Yuan/kg</td>
</tr>
<tr>
<td></td>
<td>- Each Mu uses urea around 18.3kg; costs around 43.9 Yuan / kg;</td>
</tr>
<tr>
<td></td>
<td>- Each Mu uses composite fertilizer around 28.9kg; costs around 95.37 Yuan</td>
</tr>
</tbody>
</table>

3.2.2 Problems

- Inadequate use of organic fertilizer. It is found that the majority of planters
rarely use manure or organic fertilizer. In Douhu, Taishan, for example, in more than 90% of the planting field organic fertilizer is not applied.

- **Unbalanced fertilizing in different stages.** Most planters use fertilizer before tillering stage; a small fraction of the planters uses panicle; a smaller fraction uses postheadings.

- **Unbalanced fertilizing among nitrogen and phosphorous and potassium fertilizer.** Planters still use nitrogen fertilizer in general, only a small number of planters use phosphorous and potassium fertilizer.

- **Low efficiency & high wastage rate.** From Huizho’s stats, in recent 3 years, the wastage rate is 70%; In Douhu, Taishan, the chemical fertilizer’s efficiency is lower than 30%, which results in soil hardening and water pollution.

### 3.3 Analysis on compensation

### 3.4 Process and mechanism

(1) **IC Card**

An IT company is responsible to make IC card and its software. Information of planters will be collected and recorded in the system. Individual planters will receive their cards after the village committee confirms the information. Cooperatives collect their IC cards in town.

(2) **Purchases and compensation**
Fig 3-1: Formulated Fertilizer / Slow-release Fertilizer / Rice System Compensation Flow Chart

- The designate material supplier should provide computer and internet access, and apply to the county’s agricultural department. Contract will be signed for the selected supplier and IC card system installed.

- After planters receive the manual, they use IC card to purchase from the material supplier. They provide IC card and sign the planter information sheet, and receive a discount in proportion to their land area. The city PMO and county PMO will supervise on the material supplier.

- Planters practice fertilizing by the technical requirements in corresponding documents and booklets, and keep records. They can contact local professionals for technical support.

- The material supplier uses IC card data and planter information sheet to settle accounts with fertilizer factory; and settle the account with provincial PMO.
(3) Withdrawing
If planters want to withdraw from the project, they should fill out application form explaining the reason and submit it to the village committee. When approved, they return IC card and the information sheet.

3.5 Risks and suggestion

3.5.1 Risks
- Fertilizing habits and amounts are difficult to control. The instant effect is subtle to planters.
- Unpredictable factors (weather, etc) may result in reduction of production amount, which would cause suspicion among planters

3.5.2 Suggestions
- Setting up example zones, and letting the enterprises show the techniques to individual planters; start first from improving fertilizing habits and techniques.
- Agricultural tech center needs to set up a complete encouragement mechanism and improve training programs and methods.
- Increase the number of formulated fertilizer supplier; strengthen the scale of influence;
- Send professionals to give home training and monitor the quality of soil in long term;
- Collaborate with big fertilizer factories to ensure quality.
- Conduct further supervision and evaluation
Part 4 Pesticide Reduction

4.1 Involved Social Groups

Fig 4-1: Involved social groups in pesticide Reduction Project

4.2 Current condition and analysis

4.2.1 Current use of pesticide

- Individual planters use similar pesticides (mainly domestic low-toxicity pesticide). Physical and biological methods are applied in small fraction.

- Pesticide amount is quite the same. Individual planters use the least; cooperatives the highest.

- Planters apply pesticide according to reports from agricultural tech center. It is found that many villages will apply pesticide uniformly within 1-2 days after the recommended period, forming a spontaneous reaction.

- Cooperatives and large planters use more machinery than individuals.

Table 4-1: Comparison of pesticide usage habit of types of planters (rice; one season)
4.2.2 Problems

- **Incorrect method of using pesticide.** Many planters directly use tube from bucket to spray the pesticide without a sprayer. The spray is not uniform; large amount of pesticide fall to ground causing waste and pollution.

- **Outdated tools.** Individual planters cannot afford the high price of purchase and maintenance of high-efficiency tools. Inefficient tools also caused pesticide waste and pollution.

- **Lack of knowledge & uses of highly toxic pesticide.** High-efficiency, low toxic pesticide is more expensive. Due to low profit of farming and knowledge, planters are excessively concerned with price and use highly-toxic pesticide.

- **Incomplete infection monitoring and report network.** Due to lack of monitoring system and professionals in counties and villages, current infections are forecast by investigation in limited area. The result is not satisfactory.

4.3 Analysis of compensation

4.4 Process and mechanism
Fig 4-2: Biological pesticide and highly-effective low-toxic pesticide compensation flowchart

1) Provincial PMO selects biological pesticide and highly-effective low-toxic pesticide list, and distributes the IC cards according to the stats from city PMO.

2) Every year before project execution, the city PMO and the county agriculture department survey planters (cooperatives, companies, farm market, large growers and individual planters) and farmland area of each type of product, submit it to provincial PMO’s IC card system. Then the provincial PMO determines the compensation quantity of pesticide from the stats, and save the account value to the IC card. Planters uses IC card as cash to purchase listed pesticides in the designated material supplier (biological pesticide or highly-effective low-toxic pesticide). At the same time, planters should turn in disposals of pesticides bought last time to the material supplier for recycling. The city and county PMO supervises and supports the planters and the material supplier.

3) After each planting season, the material supplier submit the records of the planters’ pesticide purchase to corresponding material dealers. The dealers settle the accounts with the provincial PMO from planters’ pesticide purchase record. Then the dealer settles the accounts with the material supplier according to the selling records.
4.5 Risk and suggestions

3.5.1 Risks

- The habit of using pesticides is hard to change and the amount is hard to control.
- Planters fail to meet the technical requirements and blame the techniques itself.

3.5.2 Suggestions

- Industrial planters can manifest their own monitoring system to keep track of the effects of the project to reflect the true effects of the project.
- Professional cooperatives can collaborate with technical companies and recommend pesticides, physical and biological methods.
- Agricultural tech center needs to set up a complete encouragement mechanism and improve training programs and methods.
- Send professionals to give home training and monitor the quality of soil in long term;
- Conduct further supervision and evaluation.
Part 5 Livestock Waste Management

5.1 Involved Social Groups

- Farmers
- Organizers (city, county, village)
- Technical support team
- Construction team

5.2 Condition and Analysis

Up to now, large farms in Guangdong province have some fundamental facilities in waste disposal. However, some farms have expanded and the old facilities are unable to meet the requirements. Expansion or reconstruction of the facilities is required. In addition, some farmers are unwilling to build high-cost disposal facilities, and choose to build simple ones instead, which makes the effect unsatisfactory. In the investigated farms, it is found that many farms have low pollution-free treatment rate, and insufficient disposal facilities.

From the aspect of the farmers, the difficulties they face are mainly lack of investment and technology.

5.3 Need and knowledge

- **Strong need in participation:** 100% of the farmers are willing to participate in the project. This is because of the current environment policy. The majority of farm owners are upgrading the facilities in advance.

- **Good preparation.** The farmers are very supportive to the project and are fully prepared.

- **High expectation.** They hope the project will improve the production and environment of the farms.
5.4 Process and mechanics

Fig. 5-1  Flow chart of livestock waste management project

5.5 Risks and suggestions

(1) Risks

- Self-raised funds from farms are not sufficient
- Selection of farms and purchase process could be biased; secret operations might take place
- Completed facilities might not be maintained due to high cost.

(2) Suggestions

- Elaborate the assessment system of the project; involve 3rd party experts to check; strengthen supervision of the project.
- Build a complete administrative system, sign the tripartite agreement; make sure the purchase process and price is open to public, and avoid falsely high numbers in the project.
- Build mechanisms for withdrawing the project; clarify the responsibilities of the party that breach the agreement.
- Conduct further supervision and evaluation
Part 6 Conservative Tillage

6.1 Involved Social Groups

(1) Operation Unit

According to the result of the investigation organized by Dept. of Agriculture of Guangdong Province, and the conditions in each demonstration site, the following sites are selected for conservative tillage:

- Rice demonstration sites (2):
  - Lutian Vegetable and Rice Professional Cooperative (300 Mu) and Academy of Agricultural Sciences (100 Mu), Niujiang County, Enping, Guangdong
  - A 400 Mu Rice farmland in Botang County, Bolo, Huizhou, Guangdong

- Rainfed corn demonstration sites (2):
  - Wufengtai Investment Co., Ltd. of Shenzhen, Lianping Branch (500 Mu)
  - Zhou’s Papaya Professional Cooperative, Pingtan Village, Pingtan County, Huiyang District, Huizhou, Guangdong. (400 Mu)

(2) Experts

Technology promotion and ensuring expert group is led by experienced unit in research and promotion of agricultural machinery in South China, in collaboration with other experienced units in the country and experts in cultivation, planting, fertilization.

6.2 Conditions and Need Analysis

Conservative tillage is a new tillage technique in contrast with the classical tillage, and is seldom used in the country. There’re not many examples as well. In the investigation, it is found that most planters are not familiar with the term. After the explanation from the investigators, they doubt the actual effects of the practice, and would not take the risk to perform it. Thus, individual planters do not have the knowledge or need for conservative tillage. It is suggested that the project starts with large growers, enterprises and cooperatives as experimental site, and come up with a practical plan before promoting it.
6.3 Process and Mechanisms

(1) Organizing:

- Purchased facilities are owned by the government. They are put to use in experimental sites. If anticipation is met in 3 years, then the facilities are transferred to the operation unit.
- The subjects are large growers of the demonstration site, leading enterprises or professional cooperatives.
- Conservative tillage demonstrations will be operated under the guidance from the expert group.

(2) Project Implementation

Contracts are signed with planter. The project supplies the facilities and maintenance fee. Planters operate the facilities themselves, while the expert groups guides them when and how to use the facilities. Planters purchase fertilizers and pesticides themselves and use them with the help from the experts.

6.4 Risks and suggestions

(1) Risks

- Immaturity of tillage and facilities could cause degradation of the product.
- The technology is limited in condition and effect, and is therefore difficult to promote.

(2) Suggestions

- It is needed to strengthen the development of prophase technologies and to carry out experiment trials and modifications of the facilities.
- Keep detailed record during the implementation, and summarizes experiences from success and fails.
- Reserve some funds for compensation for production loss.
- Set up some encouragement funds and award it to successful applicant of the technology.
Part 7  Women

7.1 Current condition

The responsibility of women in family and society, the opportunity and roles in the project, and the benefit for them are all factors that affect their participation. It is found that if women are in a relative higher position in her family, the gender factor will be de-correlated from the participation in the project. It is also found that some women perform farm work individually. As the education level and social status of women increases, women farmers are gradually walking out of their doors and participate in farm work. Their ability also rises in the process. Note that in some places, working women farmer rise to 70% of the total population.

7.2 Existing Problems

7.2.1 Less opportunity to receive training

From the investigation, 95% of the women have never entered a training program of agricultural technology organized by the county. Usually such programs request one person from one family to participate, and therefore by convention men in the family are responsible to enter the program and discuss with other villagers. When they get home they share their knowledge with women. It is found that 90% of the women found such practice normal, and do not have a strong will to enter the program.

7.2.2 Influence of women’s health from pesticide

Women farmers are the main labor force in farming families. However, the application of pesticides, especially highly toxic pesticides has affected their health. It is found that after one week of using the pesticide, the odor still remains in the clothes and hand. This causes negative effects on their aspiration system, skin and eyes.
7.3 Women’s willingness and Suggestions

It is found that, 90% of women are supportive to the project, expecting it to reduce the cost of planting for the family, and to increase the production rate and profit by the new technology.

As the education level and social status of women increases, women now have the same rights as men in daily life, health care, education and employment. We suggest that more concern be placed in women’s willingness to participate. It is suggested that the project provide them with more opportunities of study, and organize them to participate in training and monitoring program. In addition, more propaganda on highly-effective low-toxic pesticide is helpful to promote women’s health condition.
Part 8 Anticipated Social Benefits

8.1 Ecological Benefits

8.1.1 Effective control on non-point pollution in agriculture

The project can reduce the amount of pesticide, fertilizer and livestock waste, and effectively reduces non-point agricultural pollution of pesticide, fertilizer and livestock waste. Computation shows that after 5 years the amount of fertilizer will reduce 10% or more; the nitrogen fertilizing efficiency will rise to more than 35% from current 25%; phosphorous from 15% to 20% or more. Annual COD emission will reduce 10% and the ratio of polluted water will rise.

8.1.2 Reduction in disease and promotion of health condition

The biogas project and livestock waste disposal project will effectively reduce the source of infection; weaken the route of transmission by anaerobic fermentation of human and livestock waste. It will reduce the occurrence of diseases, epidemics, and improve health condition of the farming families.

In addition, ferment residues are good sources of organic fertilizer. Using it will reduce the amount of fertilizer the chance of plant diseases and insect infection. It will raise the quality of agricultural product and farmer’s health.

8.1.3 Improvement of Rural Environment

Unprocessed waste from agricultural practices in rural area will cause pollution of water, soil, air and farm product. It is found that the general rural environment can be summarized as “haystacks everywhere, trash everywhere, dirty water everywhere, stool everywhere, livestock everywhere, flies everywhere and smoke everywhere”. This project is capable of improving the rural environment, moving away stools and smoke. Improvement of environment will enhance the tertiary industry especially in sports, tourism, entertainment, food manufacturing, and therefore enhance the balanced development of environment and economy.

8.2 Social Benefits

8.2.1 Change of ideology and lifestyle of farmers

The import of new technology, fund, and new information will effectively renew the ideology the farmers have, and enhance their thinking of green development. By
education and training, more farmers will understand the importance of protecting the environment from pollution, and participate in environment protection. In this way they can gradually move away from the outdated traditions of living and working.

**8.2.2 Branding effects of farm product**

The implementation of the project can effectively improve the production environment, control the pesticide amount, and improve the quality of agricultural products. At present, natural pollution-free green agricultural products are gradually becoming the first choice for the majority of consumers, and they trust some brands. From demonstrations of some farm families this project will enhance the production and trade of natural pollution-free green agricultural products, and will have good effects and profit from farm product brands.

**8.2.3 Strengthening the ability of community and institutes**

The project has a high management and technical requirement on agriculture departments. At this time, a large number of involved counties have never implemented such a project, and are in need of advanced experience and technologies from the world. It could be foreseen that by using the fund from World Bank to perform system development, facility construction and training, the ability of the personnel in the project will be greatly improved, and the efficiency and creativity of this institutes will be enhanced.

**8.3 Economical Benefits**

**8.3.1 Increase of farmers’ income**

It could be anticipated that the technology of reduction of fertilizer and pesticide will improve the income level of the farmers and raise their life standard. Household biogas has both direct and indirect economic benefits. Direct benefits include reduction in fuel (coals, natural gas, woods, etc.) consumption, reduction in fertilizer usage from biogas slurry and residue. Indirect benefits include the thrust given by the project to livestock raising, farm product quality improvement and saving of labors. From the Ministry of Agriculture, a biogas pool of 8 square meter will raise the family income by 478.54 Yuan.\(^1\)

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\(^1\) Data Source: Science and Education Division of the Ministry of Agriculture at the energy ecosystem
8.3.2 Improvement of production rate and industrial structure

The project is in tight combination with the life and work of farmers. At the same time of solving the energy problem of the farmers’ life, it will promote livestock raising industry, adjust planting industry’s structure, expand the influence to food manufacturing, and therefore realize the planters’ cooperative economy and enhance the development of organic agriculture. For example, we can combine the pollution control with the construction of rural characteristic industry, effectively realizes the special effect of biogas in connecting the livestock-raising and planting to expand the synthetic benefits of agricultural industry chain. This will improve the utility of agricultural resources and the sustainable economy development in rural areas, and realizes “low energy, low emission, recyclable, reusable, highly-efficient” economy

8.3.3 Construction of technology system of sustainable ecological agriculture

This project emphasizes on expanding and application of farmland fertilizer and pesticide reduction, biogas technology, livestock waste recycling and disposal technology. It utilizes the essence from traditional agriculture and the outcome of modern technology to resolve the conflict between the economic development, environment protection and resource utilization by ecological engineering.
Part 9 Risks and Corresponding Strategy

9.1 Management risks and strategies

This kind of risk comes from the project management unit. It results from the inappropriate management of the project. It includes: (1) Separation of management and loan management; (2) Traditional top-to-bottom methodology in management; (3) over-concern of facility construction and insufficient concern on educational merit.

Strategies

— We need to establish a mechanism for collaboration between the PMO and the loan management department, and uniformly arrange loan, payment and other tasks.

— We ask the government to organize and coordinate the project well and ensure the successful implementation. They need to strengthen the organization, produce good design and implementation plans of the project.

— They need to give training to the managers of different levels in the project before implementation. The content includes not only implementation, fund management, payment, purchasing, accounting and foreign language, but also participation method, ideologies of community development and working methodology.

9.2 Benefit Groups’ Risk and Strategies

The project community and its population are not only the beneficiaries of the project but also the participants. The environment of the community, its population’s ideologies and education level can either be the guarantee of the success or a risk factor. It includes: (1) The beneficiaries have limited education and capability; (2) Traditional ideology and farmerist’s deep influence hampers participation; (3) Negative community environment, for example the manager’s autocrat working style, and the ignorance of people.

Strategies

— The PMO should pay attention to the knowledge and skill improvements of the farmers. In different stages of the project, it should carry out various training problem based on the need of the farmers. It should also raise the income of the
participants in various ways.

— Strengthen propaganda and education on the importance of pollution control, raise the knowledge level of the farmers, and encourage them to change their ideologies. The farmers have the freedom to participate or not to participate; and no forced participation is allowed.

— The PMO should conduct detailed survey on the targeted villages, choose the ones with good social conditions, and work out the regulation of the project at the community level.

9.3 Natural risks and strategies

This project is mainly on non-point pollution control, and is subject to natural disasters. This includes floods, drought, typhoon, hail, extreme temperature, and epidemics.

Strategies

— For weather disasters, we can track the history of the local weather, and compute the probability of the occurrence and expected loss of such disasters. We need to formulate an emergency solution in advance, and make prompt announcement to planters. We can also build reserve houses for fodder and hay, and at the same time collaborate with neighboring agricultural zones in sharing the materials

— For epidemic preventions, we mainly rely on building a scientific epidemic prevention system and educating the planters to strictly follow it. Meanwhile we should also give the farmers related training to promote the ability in livestock handling.

9.4 Technological risks and strategies

Technological risks are mainly from (1) The effect of fertilizer and pesticide reduction and the rural biogas application; (2) Large livestock farm’s waste recycling and pollution-free disposal. If these new technologies are immature and the effects are not significant, or some new strains are not suitable to the climate or the soil in the zone, then these technologies might not give the planters good profits but loss as well.

Strategy
— The quality must be ensured at all aspects. Regulations should be made. Training should be completed in advance; emergency plan should be in place.
— Experiments should be carried out for the technologies and strains that will be implemented on the project district. In addition, changing the top-down executive order style of management, encouraging community participation, and consulting planters about their opinion is also a way to avoid the risk.

9.5 Policy and System Risk and Strategies

Policy risk is the difficulty brought by the imperfect policies or the malpractice of the policies. It can be macroeconomic policy or the project-specific policies. Macroeconomic policies include industrial policy, land policy, import and export policy and currency policies. These policies are not affected by the project.

**Strategies**

— By scientific planning, the project can come up with policies that benefit the implementation of the project. For example, by setting the lower bound of the ratio of women participation, or giving priority to planters in harder economic status, the policies can enhance the participation of the vulnerable groups. To design practical, beneficial to the participant and the goal of the project, the designer of the project should be well knowledgeable to the targeted area. Detailed investigation and encouragement of farmers’ participation in planning is the best way.

9.6 Market Risks and Strategies

Currently the strains of fruits and vegetables in the market are in rapid change. The way to bring the products to the market and keep its competitiveness is directly related to the farmers’ income. For example, the livestock raiser will experience loss if the price of livestock drops in the market.

— To avoid such risks, the most practical solution is to help the farmers build the cooperatives of technology and economy. By helping each other, they can face the market together. Another way is to use the pattern “enterprises + planters”. The planters can sign contract with enterprises, and sell their products to the enterprises regularly.

— We can help the farmers to better predict the market, and determine the strains
and quantity according to the need of the market.
Part 10 Operation Plan

10.1 Suggestion on project plan and realization

The general goal of this social evaluation is for optimizing the design of the project and its effective implementation. Therefore its value greatly relies on the participation in all stages of the project and on-time suggestions to the reports and proposals. Table 10-1 summarizes the suggestions from the evaluation team and its realization.

Table 10-1: Suggestions from the evaluation team and its realization.

<table>
<thead>
<tr>
<th>No.</th>
<th>Suggestion from social evaluation groups</th>
<th>Realization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Due to the scale and complexity, the project should start from some demonstration sites and expand it after it become mature.</td>
<td>Accepted. 6 counties are selected from 30 to implement the project for first year.</td>
</tr>
<tr>
<td>2</td>
<td>Planters are mostly concerned the profit from the project, and are sensitive to its cost. The project should ensure the production and income.</td>
<td>Feasibility and stability of the technology and production is raised in consequence. Conservative tillage has reserved some fund for compensation.</td>
</tr>
<tr>
<td>3</td>
<td>Large growers, individual planters, cooperatives and enterprises have different habits, levels and methods production in using fertilizers and pesticides. Tech solution and compensation plan should be separated for each group.</td>
<td>Accepted. Different compensation plans have been made.</td>
</tr>
<tr>
<td>4</td>
<td>Investigation at base level should be deepened. The evaluation team has clarified the fertilizer and pesticide’s usage, type and brands, supplier, manufacturing costs, etc., providing evidences for making encouragement and compensation plans.</td>
<td>The reports and plans are based on deep study of the provided data.</td>
</tr>
<tr>
<td>5</td>
<td>It is found that compensation is needed for the planters to change their habits. Acceptable compensation level is between 25% - 50%. Most planters cannot accept decreasing annual compensation.</td>
<td>Partially accepted. Compensation plan is changed to a uniform annual rate.</td>
</tr>
<tr>
<td></td>
<td>Social Impact Assessment Report of World Bank Project</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>In the compensation plan, at the first stage of     compensation, the compensation of the backpack pesticide sprayer is not included. In the evaluation, it is found that this tool is effective and greatly welcomed by the farmers. It is suggested to be included. The research units should pay attention to it and give some consideration.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Most planters worry about the fairness of the implementation. They hope the project to be opened to public and fair. They are also concerned with the fertilizer and pesticide’s quality, as well as the buildings’ quality. The project manager is very concerned of the point. It is mentioned many times in the meetings. We suggest the fairness be ensured by public announcement, expert review and contracts.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Using bottom-up method of survey helps implying true opinions of the farmers in the project design, making up of the deficit in top-down design approach, and increase its feasibility. Accepted. The project proposal becomes more concerned of subjects’ willingness and opinion.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Basic level workers as village committee members are the terminal of management and implementation. Their duties are heavier but the salary remains the same. This hurts their enthusiasm. It is suggested that stipends be given to the workers in base level. Accepted. In funding budget and compensation proposal, stipends for basic level workers are included.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Planters’ education level is limited. Some senior planters have eye problems. It is suggested that the brochures be printed in bigger letters and more pictures be added. Accepted. Plans are made to publish manual brochures.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Planters usually self-learn the farming skills, and pay close attention to the experience of the skilled ones. Thus while designing training programs, it is suggested that multiple methods be applied to adhere to planters’ habits. In addition, we should pay attention to the modeling effect of the skilled ones. Accepted. It is confirmed that the villages and planters that contributes to the project will be awarded.</td>
<td></td>
</tr>
</tbody>
</table>
12 Because the ownership of land, utilization of farmland, and land acquisition for construction is related to resettlement issues, it is suggested that attention be paid on the issue. The utilization of the land in the project area should be completely clarified and reported to the World Bank. Accepted. Current investigation clarifies that no land acquisition is involved. Corresponding reports are made.

13 Some farmers cannot accept the plan that 35% of self-raised fund be paid one-time. According to the previous practices, it is suggested that installment be used to reduce the pressure of the farmers and promote their confidence. Rejected because the self-raised fund from farmers must be ensured.

10.2 Suggestions on the Subjects

(1) Use the model effect from professional cooperatives and large growers

Planters prefer learning from others, and will imitate successful practice of others. Professional cooperatives can lead planters. Meanwhile large growers have good reputation among them and are more willing to accept new techs. We suggest that they set up models at the first stage, and lead other planters to try new technologies.

(2) Set up standard and regulation in subject selection, and respect the subjects own will

We should set up standard and regulation in subject selection, guide the basic level managers to settle subject selection, and accelerate the implementation. While selecting the subject, we should patiently explain the project and pay full respect to subjects’ own will. No forced participation is allowed.

(3) Ensure low-income planters, and women have equal opportunity to participate in the project.

We need to ensure low-income planters, and women have equal opportunity to participate in the project. If the project only selects those that have ability to repay the loan, or planters with relatively high income, it will result in imbalanced profit of different social groups or even cause conflicts. This will also cast doubt of the
feasibility of the project.

(4) Pay attention to urbanization factors in the targeted area

We should avoid selecting locations in fast urbanization process. In Encheng street, Enping, farming population consist of only 21%, which indicates high urbanization rate for the area. It is suggested that while choosing the targeted area, we should avoid the effects of city construction and land acquisition.

10.3 Suggestions on Implementation and Related Mechanisms

10.3.1 The operating mechanism of the project

(1) Gradually expand from point to surface

Due to the scale and complexity, the project should start from some demonstration sites and expand it after it become mature. We first choose some large growers and planters with good reputation, or some villages with better conditions to start the application of new technology. From point to surface, we can let the planters see the real effects and motivate them to participate in the project.

(2) Further improve mechanisms of participation and discussion

The main purpose of participation-oriented planning and discussion is to ensure the self-willingness of participation. The involved social groups participate in the decision making and at the same time learn corresponding technologies after they fully understand the information of the project. Discussions, surveys, interviews and feedbacks are taken to strengthen the communication between the government and the related groups, so that people are willing to take part in the project in designing, implementing, managing and evaluating process. Process should be reported in a timely basis; suggestions from government and other institutes should be heard in time to continuously improve the operation of implementing the project. Problems should be raised about kinds of problems in implementing and solutions should be planned in advance.

(3) Use multiple propaganda techniques

In pollution control, we should realize the power of the public media in order to promote participation of all social groups involved. On one hand, the public should be informed of the importance of the pollution control; on the other, more effort should
be taken in educating the public about facts, technologies, policies, laws and experiments of the environment protection.

- Help the farmers to better understand pollution control and to change their ideology. The concepts of the project should be spread into villages. The responsible organizers should motivate the villager to participate in learning the concepts.
- Use multiple types of media. We can combine the habits of the farmers; use TV, radio, announcement board and internet for advertising.
- In addition to organizing training program, guidelines and brochures should be distributed to planters.
- Use modeling effect of rural cooperatives and related social organizations.

(4) **Use multiple implementation methods; unleash the strength of social organizations for expanding the technology**

- Planters are sensitive to cost. For the projects that raise the cost for planters, multiple methods should be applied, so that different solutions are presented and chosen by them. Planters’ burden should be lowered as much as possible to keep their enthusiasm. For example, small farms can share biogas facilities.
- The best way for pollution control is letting the producers apply environment-friendly technologies, so that the source of pollution is eliminated. Therefore, environment-friendly technologies are the key in pollution control, which require the social groups, especially research institutions, to develop some simple, economical and environment-friendly technologies, so that planters can control the pollution from its source.

(5) **The process should be standardized and open to public**

The facility and construction purchase standards should be open to public. The planters’ fund should be clearly accounted to avoid false numbers. The most concerned construction quality should be ensured.

### 10.3.2 Encouraging mechanism

(1) **Scientifically set up compensation standard**

Planters are mostly concerned the profit from the project, and are sensitive to its cost. The project should ensure the production and income. The lowest compensation standard
accepted by the planters is between 25% and 80%. It is suggested that mature mathematical models are applied to set up a scientific compensation standard.

(2) Award contributive subjects

The project should set up award for contributive subjects in organizing events, expanding technologies and giving support, such as technical station, planters and experts.

(3) Set up compensation for basic level workers

Basic level workers as village committee members are the terminal of management and implementation. Their duties are heavier but the salary remains the same. This hurts their enthusiasm. It is suggested that stipends be given to the workers in base level.

(4) Improve compensation system for agricultural ecology

Major developed countries have started practices of compensation of agricultural ecology since 1970s. For example, the US government gives compensation to farm owners who are willing to take best measures to reduce non-point pollution. EU and Japan also have similar measures. China should also improve compensation system for agricultural ecology to motivate the farmers to control agricultural pollution.

10.3.3 Supervising system and mechanisms

(1) Combine with some established methods

To ensure the quality of products, some enterprises have established a rigid system of regulation and facilities to sample and monitor pesticide residue, heavy metal components in the vegetables. These methods can be combined with the monitoring and recording system of the project to better reflect the true effect of the project.

(2) Set up dynamic monitoring system for the entire process

To evaluate the success of the project, the information of social management plan should be acquired promptly and adequately. Tractable monitoring and evaluation program and standards should be established. The need of the subjects should also be recorded during the process, and modifications of the plan should be made to eliminate the factors that harm the social goal of the project.

Monitoring is performed together with the project, and proper evaluations are to be made annually after project implementation and reported to corresponding
departments. Monitoring and evaluation is to ensure the project be implemented according to the plan.

① The PMO reports the project process and arrangement in a timely basis. It is suggested that the PMOs publish some briefings and post them in the community.

② After each major activities, such as fertilizer and pesticide reduction, or biogas technology training, the PMO or management team should consult about feedbacks from the participants and keep good records of them, so that in later events improvements can be made, and more information is collected for evaluation.

③ For each project location, several households can be employed to perform daily monitoring of some parameters to ensure planters participation and fairness. The household can be substituted in a timely manner.

④ The PMO should setup plans and goal of monitoring, and organize the implementation. It should arrange technicians to form special monitoring group. Monitoring points should be set up in forestry stations, and necessary instruments and tools should be equipped.
Annex I: Social Assessment Report Methodology

1. Objective and Focus of the Assessment

The general objective of social assessment (SA) is to provide service for the optimized design and effective implementation of the whole project. By identifying the stakeholders, the assessment team will monitor and assess all kinds of social impacts of the invested project, provide recommendations for the implementation of the construction of optimized project, promote stakeholders to take part in the project activities effectively and minimize the social risks of the construction project.

This social assessment is focused on the main executers of the project (farmers). Through analysis on the four major stakeholders (project organization, project executers, project technical supporters and other public related (see Annex 2), we found that the executers’ (farmers’) willingness and attitude to participation is decisive for the effective implementation of the project. Moreover, in interviewing the stakeholders, the social assessment team gave special attention to the disadvantaged groups such as women and impoverished family groups.

2. Methodology of Investigation and Study

Methodologies adopted in this social assessment include material analysis, experts and cadres symposium, focus group survey, sampling, tracking investigation, open semi-structural interview and project impact matrix analysis, so as to assure different kinds of stakeholders and farmers in the project village would take part in the project voluntarily, fairly and actively.

(1) Material Analysis

- Sampling range: 30 townships of 2 cities and 6 counties within the project area.

- Investigation contents: information about the status of social and economic development, population and poverty, and agricultural non-point pollution (fertilizer pollution, pesticide pollution and livestock and poultry waste pollution) of the administrative units in each project site, which would help fully collect the macro information about the background of the project
implementation in the project site.

(2) Experts and Cadres SA Survey Interviews and Discussion

- Attendances: main leaders of governments at different levels, persons in charge of relevant departments, members of village committees and agricultural technology experts. Special attention should be given to the staff of grass-root project implementing agencies.
- Times of interviews scheduled: 22 in all (covering 10 townships of 2 cities and 6 counties within the project sites).
- Investigation contents: heeding project organizers’ and managers’ understanding, opinions and recommendations to the project, collecting problems that may be faced in the process and listening to the experts’ recommendation on the implementation of the project.

13 symposiums at different levels have been held by now (see Annex 3).

(3) Focus Group Survey

The assessment team selects some representative agencies as individuals and cooperatives among all the objects for an overall and in-depth survey of the project executors (farmers). The purpose of doing this is to understand the general properties and laws of similar things through direct and in-depth survey and study of individual models.

- Sampling range: related stakeholders (crop farmers, women, cooperatives, enterprises and agrotechnical stations) selected from all the project townships and representatives with project intent selected from the livestock farmers.
- Number of samples: 4 project townships each with 8-10 individuals from crop farmers including large crop farmers and individual farmers, 1-2 women, 8-10 livestock farmers, 2-3 cooperatives, 3-4 enterprises, 1-2 agrotechnical stations and 1-2 agricultural material stores.
- Sampling method: SA team would select model townships and issue requirements for choosing objects to relevant departments of the model townships, and then discuss and choose the objects for interview.
Following means would be adopted in focus group survey:

a. **Villager Group Meeting**

Under the organization of local governmental departments, representative models for interview would be gathered to a brief villager group meeting. At the meeting, the basic information of WB project and the purpose of the meeting would be explained, local villagers’ understanding, support level, opinion and recommendations would be understood, in-depth interview be made and questionnaires be filled in.

b. **Semi-structural In-depth Interview**

Making an operation outline for one-on-one semi-structural field interview to representative objects (see Annex 4 for the interview outline). The interview contents include basic information of production of life, conventional application of pesticide and chemical fertilizer, current cost structure, and opinions on the subside standards and system.

**Calendar of Agricultural Activities: Daily Life and Seasonal Activities**
(including farming, cooking, relaxing, entertainment and communication etc.)

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<tr>
<th>Time</th>
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<th>4</th>
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<th>6</th>
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<tr>
<td>Activity</td>
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</table>

**Calendar of Seasonal Activities**
(including soil tilling, crop planting, fertilizing, pesticide spraying, harvesting and so)

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<tr>
<td>Farming activities</td>
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<td>Fertilizing</td>
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<td>Pesticide</td>
<td>Types</td>
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</table>

c. **Field Visit**

Making direct visit to the fields and livestock breeding farms to observe the
status of crops, agricultural equipment, land use and the neighboring environment, collect information from the survey objects in time and make record and quick judgment assessment.

(4) **Questionnaire**

Based on different phases of the project implementation, multi-level questionnaires were designed for this social assessment. On the basis of in-depth interview, the assessment team made questionnaires for relevant groups covering different kinds of stakeholder groups (see Annex 5 for the questionnaires).

By now, 3 rounds of questionnaire distribution and survey have been carried out. Each questionnaire was designed in light of the progress of the project (see Annex 6 for the detailed information about each round of questionnaire distribution and collection).

(5) **Sampling Survey**

The project team gave much attention to the sampling survey, trying to choose randomly some individuals or agencies from the whole survey objects as samples and deduce the overall situation through sample survey and study.

- Sampling method: Accompanied by local staff familiar with local situation, choosing right time to make field visits to townships and villages, conversing with farmers randomly, asking them to fill out the questionnaires and collecting them on the spot.

- Number of samples: 5-8 individuals chosen from each project township, focusing on women at home and poverty groups.
Annex II: Annex I SA Survey Methodology

1. Field visit
2. Office visit
3. Stakeholders symposium
4. Questionnaires distribution and collection
5. Prepare work plan and outlines
6. Status survey and study
7. Stakeholders-project social adaptability assessment
8. Relavent cases analysis
9. Project object definition
10. Social economic status of project site
11. Basic information of project
12. Primary identification of stakeholders
13. Primary identification of project impacts

Adaptability among project stakeholders

- Provincial project management office
- Governmental depart. at city/county levels
- Project executors
- Enterprises
- Farmers
- Cooperatives and village committees
- Attitude to participate project
- Project demands adaptability
- Project feasibility
- Project Adjustment suggest
Social Impact Assessment Report of World Bank Project

Social impact evaluation

- Economic aspect
  - Regional production level
  - Residents income and distribution
  - Infrastructure construction
  - Industrial transform and upgrade

- Social aspect
  - Income and living standard
  - Employment and social safeguard
  - Ideological attainment
  - New-tech promotion and application
  - Agricultural brand effect
  - Pollution control
  - Livable and employable level
  - Residents health status

- Ecological aspect

Project social management plan

- Social risk assessment
  - Risk avoidance and prevention plan

- Project social management plan and measures aspect

- Whole process monitoring scheme of project implementation
## Annex III. List of SA Survey Interviews Carried Out

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Time</th>
<th>Place</th>
<th>Numbers of interview objects</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2012.9.20</td>
<td>Agricultural Bureau of Huizhou City</td>
<td>10 officials from municipal agricultural department</td>
<td>Understanding the status of local ANP, consulting the progress of local project and listening to agricultural department’s opinion on the project.</td>
</tr>
<tr>
<td>2</td>
<td>2012.10.12</td>
<td>Agricultural Bureau of Huizhou City</td>
<td>50 officials from Municipal Project Office, Municipal Agricultural Bureau and management unit of the project</td>
<td>Reporting work of current phase of WB loan Huizhou ANP project to the municipal leaders, focusing on the issues of baselines, organization and propaganda.</td>
</tr>
<tr>
<td>3</td>
<td>2012.10.13</td>
<td>Government of Huiyang District</td>
<td>35 persons including competent leaders from the Government of Huiyang District, project managers and cropping and breeding farmers representatives</td>
<td>Understanding the status of project progress in Huiyang District, giving special attention to baseline investigation. The next focus is to fulfill the works town to farming households.</td>
</tr>
<tr>
<td>4</td>
<td>2012.10.14</td>
<td>Guangboda Planting Professional Cooperative Farm</td>
<td>Leaders of cooperatives and cooperative members representatives, 20 in total</td>
<td>Understanding the organization structure and operation model of cooperatives, promoting integrated prevention and control as well as integrated purchase and sales, and giving attention to providing technical training to the farmers.</td>
</tr>
<tr>
<td>5</td>
<td>2012.11.7</td>
<td>Township Government of Changning, Boluo</td>
<td>Officials from township government and local cropping farmers, 7 in total.</td>
<td>Understanding the status of local ANP, consulting the progress of local project and listening to agricultural department’s opinion on the project.</td>
</tr>
<tr>
<td>6</td>
<td>2012.11.7</td>
<td>Village Committee of Shuikou Street, Huicheng District</td>
<td>Staff of neighborhood office and local cropping farmers, 6 in total.</td>
<td>Understanding the status of local ANP, consulting the progress of local project and listening to agricultural department’s opinion on the project.</td>
</tr>
<tr>
<td>7</td>
<td>2012.9.21</td>
<td>Agricultural Bureau of Jiangmen City</td>
<td>13 officials from municipal agricultural department</td>
<td>Officials of relevant department of Jiangmen City introduced local situation of NPS, recognizing that current situation is very serious and discussed the difficulties and hinges faced in project implementation.</td>
</tr>
<tr>
<td>8</td>
<td>2012.10.15</td>
<td>Agricultural Bureau of Jiangmen City</td>
<td>About 45 officials from Jiangmen Municipal Agricultural Bureau and Environmental Protection Bureau.</td>
<td>Understanding the progress of current phase of the project, focusing on the issues of baselines, organization and propaganda.</td>
</tr>
<tr>
<td>Serial No.</td>
<td>Time</td>
<td>Place</td>
<td>Numbers of interview objects</td>
<td>Contents</td>
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<tr>
<td>9</td>
<td>2012.10.15</td>
<td>Municipal Government of Enping City</td>
<td>Project managers of Enping City and representatives of local cropping farmers, 20 in total.</td>
<td>Focusing on production and farming methods, mode of production organization and sale, typical crops systems and the final project participants.</td>
</tr>
<tr>
<td>10</td>
<td>2012.10.15</td>
<td>Municipal Government of Taishan City</td>
<td>Official from agricultural department of Taishan City and representatives of local farmers, 20 in total.</td>
<td>Understanding the progress of the project, identifying the baseline investigation of each project site, and devoting more efforts to project propaganda.</td>
</tr>
<tr>
<td>11</td>
<td>2012.10.16</td>
<td>Municipal Government of Kaiping City</td>
<td>Project managers of Kaiping City and representatives of local cropping farmers, 20 in total.</td>
<td>Understanding the progress of the project and the key points and difficulties of the project, giving attention to the baseline investigation, enhancing up and down connection and intensifying propaganda.</td>
</tr>
<tr>
<td>12</td>
<td>2012.11.8</td>
<td>Township Government of Niujiang Township, Enping City</td>
<td>Officials from township government, members of Niujiang Township Green Land Vegetable and Rice Professional Cooperative and local farmers, 8 in total.</td>
<td>Understanding crop rotation of rice-rice-potatoes, specific implementation of integrated prevention and control and the situation of water supply.</td>
</tr>
<tr>
<td>13</td>
<td>2012.11.8</td>
<td>Agricultural Bureau of Encheng Street, Enping City</td>
<td>Officials from the Project Management Office of Kaiping City and representatives of local cropping farmers, 20 in total.</td>
<td>Focusing on production and farming methods, mode of production organization and sale, typical crops systems and the final project participants.</td>
</tr>
<tr>
<td>13</td>
<td>2012.11.27-28</td>
<td>Zhujiang Hotel of Guangzhou</td>
<td>Officials from provincial and municipal project management offices, representatives of local townships and representatives of cooperatives.</td>
<td>Interview on project supplementary standards and implementation mechanisms.</td>
</tr>
</tbody>
</table>
a. 惠州市农业局座谈会现场

b. 博罗县龙华镇溢丰养殖场新建沼气池

c. 项目区种植户填公参调查表

d. 平潭镇光辉村粮食高产示范点固废

e. 平潭镇光辉村粮食高产示范点背负喷雾器

f. 平潭镇光辉村粮食高产示范点秸秆焚烧

g. 良井镇矮光村项目点有机肥堆肥处

h. 良井镇矮光村项目点喷灌作业
i. 惠城区庄式猪场固液分离机
j. 惠城区庄式猪场好氧处理池
k. 惠城区庄式猪场排污许可证
l. 惠城区庄式猪场座谈会现场
m. 博罗县杨村镇配方肥销售网点自动配肥机
n. 博罗县广博大种植专业合作社机构组成
o. 江门市农业局座谈会现场
p. 台山市冲蒌镇黄布浪电排站水稻田示范区
Social Impact Assessment Report of World Bank Project

q. 台山市冲蒌镇岐山猪场饲料拌和罐
r. 台山市冲蒌镇岐山猪场沼气池
s. 恩平市绿田蔬菜水稻合作社灌溉水渠
t. 台山市冲蒌镇竹洛村水稻田现场
u. 惠阳区测土配方施肥示范区
v. 惠阳区平潭镇全国粮食高产创建示范点
w. 农村信息直通车工程信息发布栏
x. 水稻机械化宣传栏
## Annex IV  Questionnaires Distribution and Recalling in Each Phase

<table>
<thead>
<tr>
<th>Time</th>
<th>Distribution mode</th>
<th>Project phases and investigated point</th>
<th>Number of questionnaires distributed and recalled</th>
<th>Opinion of project team</th>
</tr>
</thead>
<tbody>
<tr>
<td>The 1st time</td>
<td>• Making field investigation and distributing (few) questionnaires to crop and breeding farmers; • Entrusting governments to distribute questionnaires.</td>
<td>In the preparatory phase of the project, investigating in a wide range the basic information of the crop and breeding farmers as well as their understanding of the project and their willingness to participation.</td>
<td>• Covering 30 townships, 50 copies per township, 1,500 copies in total. • 1,000 copies in total have been recalled from 15 townships. Among them, 600 copies are effective, accounting for 66.6%.</td>
<td>The quality of the filled-out questionnaires is less than ideal with phenomenon of fail and false.</td>
</tr>
<tr>
<td>(2012.9.20)</td>
<td></td>
<td></td>
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<tr>
<td>The 2nd time</td>
<td>• Field visit to selected interview objectives. • One-by-one in-depth interview and questionnaire investigation</td>
<td>In the initial phase of preparing subsidy standard, investigating farmers’ customs in pesticide and chemical fertilizer application as well as the information about the application quantity, cost and current subsidies of pesticide and fertilizer.</td>
<td>• 40 copies of questionnaires have been distributed to 4 selected townships. Among them, 10 copies were distributed to breeding farmers, 5 copies to enterprises and 5 to cooperatives. • All recalled</td>
<td>The data are comparatively reliable and detailed, but quite uneven in costs and application quantity.</td>
</tr>
<tr>
<td>(2012.11.7)</td>
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</tr>
<tr>
<td>The 3rd time</td>
<td>• Field visit to key townships. • One-by-one in-depth interview and questionnaire investigation</td>
<td>In the interim phase of defining key townships and preparing subsidy mechanism and standard, investigating the reasonability of the subsidy mechanism and standard as well as farmers’ willingness to accept them.</td>
<td>• 30 copies have been distributed, including 10 copies to farmers in rice-rice crop rotation, 10 copies to farmers in rice-rice-vegetable crop rotation and 10 copies to farmers in rice-rice-potatoes crop rotation.</td>
<td></td>
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<tr>
<td>(2012.12.1)</td>
<td></td>
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<tr>
<td>The 4th time (2012.12.1) (2013.2.20—3.)</td>
<td>In the process recalling</td>
<td></td>
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<td>--------------------------------------</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>● Field visit to 6 key townships.</td>
<td>● 500 copies of Q is in progress</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>● One-by-one in-depth interview and questionnaire investigation</td>
<td>Plan to write the independent brief report</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the later phase of the project design; reasonable degree of the latest subsidy design and the willingness to accept by the farmers</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
Annex V. SA Survey Stakeholder Interview Outline

I. Agricultural Offices at Township (Village) Level

(I) Basic situation of project sites

1. Population (quantity, gender, race, religion, occupation, number and proportion of agricultural and non-agricultural population)

2. Distribution and use of the natural resources (land, mine, forests etc.) owned by the said township (village)

3. The said township’s (village’s) economic income and its main sources; the proportion of these sources and their ranks among all the townships of the county.

4. The composition of the subsistence modes (agriculture, non-agriculture, livestock breeding) and its development

5. Economic development level of the said village: per capita income, poverty status, economic rank, development of collective economy.

6. The development history and future plan of the said township (village).

7. Problems and status quo of the said township’s (village’s) infrastructure construction

8. Ecological environment (NPS pollution and its impact to the daily life of local people

9. Composition and operation of the said village’s formal and informal agencies and organizations

10. Experiences of the said village on implementing similar projects

(II) Ethnic Groups (If there is no ethnic group or the ethnic group just takes a little proportion in the project site, this part can be ignored).

1. Minority species, population, proportion and residences in a village

2. Origins of the minorities

3. Minorities’ formal and informal social organizations

4. Main natural resources owned by the minorities and their customs and customary laws to protect the environment

5. Economic development status of the minorities
6. Faith of the minorities
7. Minorities’ production and consumption activities
8. Governments’ assistance to the minorities
9 Communications (intermarriage) between minorities

(III) View of the Project
1. What benefits the project would bring about to the village in your opinion?
2. What kinds of difficulties would be faced in implementation of the project in your opinion?
3. Would the NPS control project impact other activities already started? If so, what kind of impact is it?
4. Are there sufficient conditions for the village to participate the project (funds, talents, technology and villagers willingness)?
5. Who will get the most benefits from this project in your opinion?
6. Which elements would impact the implementation of the project in your opinion?
7. What kinds of negative impact the project would create to local area (social, cultural, economic, environmental)?
8. What kinds of countermeasures could reduce the negative impact of the project on local area?
9. Are women and minorities willing to participate the project?

II. Crop Farmers (including women and minorities)
1. What crops have you planted? How many acres? How about the harvest? What are the main sales channels?
2. What are the day-to-day farming methods? (preparing calendars of daily life and seasonal activities) including:
   1) Fertilizer: types, quantity, applications and cost
   2) Pesticides: types, quantity, applications and cost
   Calendar of daily life (including farming activities, cooking, relaxing, entertainment and communication etc.)
   Calendar of seasonal activities (according to the lunar calendar, including soil tilling, crop planting, fertilizing, pesticide spraying, harvesting and so on)
3. How about the ANP in your hometown and your village? What kind of countermeasure is adopted?

4. Have formula fertilizer been used through formula fertilizer station? How about the result?

5. Do you know this project? What time, where and how? What more information do you want to know?

6. If it is necessary for you to change your customs in fertilizer/pesticide application and the added cost would be given subsidies accordingly, do you want to participate this project? How much subsidies to the added cost would be more appropriate do you think?

7. How about the market prices and sales prospect of your green and organic agricultural products? Do you think this project would lead to a growth of sales of the products?

8. What impact would this project exert on your production activities and life in the future? (positive and negative)

9. Do you approve or oppose this project? If oppose, tell the reason.

10. Do you have any suggestion on the project?

11. What impact would this project have on women’s production activities and life? What are their requirements and recommendations on the project? (only female would be asked)

12. What impact would the project exert on the production mode, lifestyle and customs of your ethnic group? What’s your recommendation? (Only persons of ethnic groups would be asked)

III. Breeding Farms of Scale

1. How large is your breeding farm? How about the species of the livestock and poultry? How about the yield and annual income?

2. How about the NPS pollution of your family farm and village? What countermeasures are there?

3. How the livestock and poultry faeces from your breeding farm are treated? How about the results?

4. If wastewater treatment facilities (methane-generating pits) are already constructed,
how about the construction area and the costs? How about the daily capacity of wastewater treatment? Can they meet the requirements?

5. Is there any plan to further improve the wastewater treatment facilities? How about the investment amount and construction contents?

6. Do you know this project? What time, where and how? What more information do you want to know?

7. What impact would this project have on the production activities and life of your breeding farm in the future? (positive and negative)

8. Do you approve or oppose this project? If oppose, tell the reason.

9. If the project needs you to assume a part of the construction cost accordingly in addition to the financial subsidies and technical support provided by WB, are you still willing to participate it? How much subsidies would be more appropriate do you think?

10. Do you have any suggestion on the project?

**IV. Farmers Economic Cooperative**

1. How large the cooperative in scale? Who are the main members? What conditions a farmer need to meet for joining the cooperative?

2. What services would the cooperative provide to the main members? What is the daily operation mode? What is the source of the operation and management funds? How about the results of operation?

3. What obligations should the main cooperative members bear?

4. What is the main fertilization technology used by the cooperative? How about the frequency and quantity of fertilization? What kinds of fertilizers are used? How about the cost, yield and income?

5. Does the state provide any guidance and preferential policies for this type of cooperatives?

6. Do you know this project? What time, where and how? What more information do you want to know?

7. Do you think what kind of role a cooperative may take in the project team? What’s your recommendation?
8. Would a cooperative like to participate the project if were invited to be an organization and management agency of the Pesticide Reduction and Pests Control Project or Conservation Tillage Project? What are the requirements?

V. Producers (chemical fertilizer, pesticide)
1. What are the main species of the products? What advanced technologies are adopted?
2. What are the main components of customers? How to establish contact with the customers and others?
3. Does the state provide guidance and preferential policies for these producing enterprises? How about the results? Do you have any improvement recommendation?
4. What are the main difficulties and obstacles met in the process of production?
5. Do you know this project? What time, where and how? What more information do you want to know?
6. Do you think what role may be taken by the said enterprise? Have you any recommendation?

VI. Agro-tech Promotion Center (Agricultural Service Center)
1. How many staff in the center? What are the main functions of each staff?
2. Who are the main service objects? How about their attitude to participation?
3. What are the main service contents? How about the service results? What kinds of technologies are well accepted?
4. How about the operation mode? How to raise the funds in need?
5. Do the state and province provide guidance and preferential policies for the agricultural service centers? What are the results? Do you have any recommendation on improvement?
6. Do you know this project? What time, where and how? What more information do you want to know?
7. Do you think what role may be taken by the agro-tech promotion centers in the project team? Do you have any recommendation?
Annex VI. Questionnaires at Stages

- **Stage I**

  **SA Questionnaire on WB Loan Guangdong Agricultural NPS Control Project**

  **Gender:**  male  female  **Domicile:**  local  non-local  **Age:**  20—30—40—50—60—
  **Occupation:**  farm  enterprise  household  **Race:**  Han  Ethnic Group ______

  1. **Current family population:**  A.<3  B.3-5  C.6-9  D.>10

  2. **Last year’s income about______ yuan, Daily expense a year about______ yuan**

     F.5000-8000  G.8000-10000  H.10000-20000  I.20000-50000  J.>50000

  3. **The largest income source of your family______** （single choice）

     A.farming  B.breeding  C.handcraft  D.small workshop  E.commerce  F.temporary works
     G.wage  H.others （write please）____

  4. **Have you received agro-tech promotion service and relevant training?**

     A.never  B.yes （what kinds__________）

  5. **Where are your technology from?** （multi-choice）

     A.government-organized training  B.self-study  C.tour study  D.experiences
     in farming and breeding

  6. **The main supply channels of the fertilizer, pesticide or feedstuff you used.**

     A.agricultural materials company  B.plant conservation station  C.individual dealing point
     D.others （write plea）____

  7. **Do you think what are the main obstacles for you to get rich?**

     A.short of investment funds  B.short of technology related  C.short of space for
     production of scale  D.short of good marketing channels  E.others

  8. **Do you know the WB ANP control project?**

     A.yes  B.no

  9. **Are you willing to participate the ANP control project?**  A.yes  B.no

     C.no care

  10. **Do you think what impact would be brought about by the NPS pollution control project?** （multi-choice）
A. increasing income and upgrading living standard  B. promoting farm productivity  C. generating good agricultural brand effect  D. controlling ANP and improving rural eco-environment  E. reducing diseases and epidemics  F. creating job opportunities and improving social security  G. others ________________

11. Do you think this project would or would not bring about any negative impact to your family or local development?
A. yes     B. no     C. uncertain    D. don't know

12. What improvement do you hope the most along with the implementation of the project?
What are your recommendations ____________________________________________

If you are a crop farmer, fill in following contents please:
①  Land area you cultivate ____________ mu.
Main crops 1)______2) ____ respective annual yield about 1)______2) ____
②  Ownership of the land you cultivate ____.
A. state-owned  B. collective-owned  C. private-owned
③  Your cultivating mode is
A. mechanized  B. manual  C. mechanized+manual
   If mechanization, what kinds of machines are used?
A. Purchased by yourself at a price of ____ yuan  B. rented with annual rent of ____ yuan  C. others
④  Amount of fertilizer need to be used each mu about_______.
   and the amount of pesticides about______.
How do you apply fertilizer? (multi-choice)
A. applying large amount of chemical fertilizer  B. mixing farmhouse fertilizer with chemical one
   C. microbial fertilizer  D. organic fertilizer  E. formula fertilizer  F. long-acting slow-release fertilizer
   Time of chemical fertilization______ and interval of fertilization_______.
⑤  Pesticide spraying methods (multi-choice)
A. hand sprayer  B. airplane cloud drift  C. others
   Time of pesticide spraying ____ and interval of spraying_______.
⑥  Has the irrigation water been polluted?
A. yes  B. no  C. don’t know
⑦  What measures have you adopted to prevent and control farm pests and diseases? (multi-choice)
(2) using highly toxic pesticide with high residues  B. using bio-pesticide  C. using high-effective and low-toxic new pesticide  D. using pesticide in the process of tillage, cultivation and breeding etc.  E. using biotechnology and gene technology.
(3) F. using physical measures like light, electricity, microwave, ultrasound and radiation etc.
⑧  Do you think about the development trend of crop production?
A. production of scale  B. mechanized operation  C. others__________

If you are a breeding farmer, fill in following please:
①  The scale of your breeding farm is______. Species of livestock and poultry include ____________.
Annual yield is about ______.
Annual income is about ______.
②  Your breeding methods are:
◆ mechanized breeding
◆ manpower breeding  C. mechanized and manpower
If mechanized, what kinds of machined are used?
A. bought by yourself  B. rented
③  Main sources of the feed are:
A. commodity feed  B. farmhouse residues  C. mixture of commodity feed and crop residues
④  How to dispose the animal manure and wastewater of the breeding farm?
A. piling and discharging randomly  B. putting into methane-generating pits for resource recycle
   C. producing organic fertilizer  D. other innocuous treatment
⑤  Have you adopted ecological breeding mode?
A. yes  B. no
SA Questionnaire on WB Loan Guangdong Agricultural NPS Control Project
(for crop farmers)

Domicile: ____ municipality (prefecture) ____ county/city/district
________ township/town/______ village/neighborhood committee

Investigator: ________________ Time: 2012.xx.xx

I. Basic information of the family (fill in the information or put “√” against your choice)

<table>
<thead>
<tr>
<th>Name:</th>
<th>Gender:</th>
<th>Age:</th>
<th>Race:</th>
<th>Occupation:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) farmer</td>
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<td></td>
<td>(2) worker</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>(3) owner of enterprise</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(4) employee</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(5) household woman</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(6) other</td>
</tr>
</tbody>
</table>

Number of family members: (1) <3 (2) 3-5 (3) 6-9 (4) >10

Educational level: (1) illiteracy (2) junior school (3) middle school (4) secondary specialized school (5) junior college school (6) university and higher

Number of main labor hands of the family is ____, mainly composed of ____

(1) young  (2) middle aged  (3) elder  (4) women  (5) employee

Last year’s income of your family is about ____ yuan, daily expense is about ____ yuan.

H. 10000-20000  I. 120000-50000  J. >50000

II. Your understanding level to the project (put “√” against your choice)

1. Do you know about the WB ANP control project?
   A. yes   B. no

1. Where did you know about this project?
   A. government propaganda or notice   B. agro-tech promotion center
   C. neighborhood   D. others____

3. Are you willing to participate the NPS pollution control project?
   A. yes   B. no   C. not care

4. Have you been enrolled in the project?
   A. yes   B. no   C. don’t know how to participate the project

5. What impact do you hope the project would bring about? (multi-choice)
   A. raising yield and increase income   B. improving production technologies such as those in
fertilization and pesticide application. C. lifting mechanization level
D. increasing subsidies E. reducing diseases and epidemics F. creating job opportunities
and improving social security G. enhancing ecological protection awareness

6. Have you any problem and recommendation about the project?

(You can put out your problems and recommendation in these aspects like subsidies and
technology promotion etc.)

III. Cultivation

1. Land area of your farm is_______ mu. The most important crop is_______. Annual
yield is about_______. There are_______ times a year.

2. The crop rotation mode is: A. rice-rice B. rice-rice-potatoes C. rice-rice-vegetable
D. vegetable-rice-vegetable E. maize-maize-wheat/beam F. others______

3. The land you are cultivating is_____. A. self-owned B. rented

4. The cultivation mode you adopt is_____. A. whole mechanization B. manual C.
mechanization+manual

   The machines you use are______________, A. self-bought with a cost of____ yuan B.
   rented with annual rent of____ yuan.

5. Have you joined the rural cooperative? A. yes B. no

6. How do you dispose the crop straws? A. smashing and returning to the field B. using as
   covering materials C. burning in field D. using as household firewood E. others

7. How do you think about the development trend of crop production? A. production of
   scale B. mechanized operation C. others

<table>
<thead>
<tr>
<th>Time periods of farming activities each day: ___ o’clock to ___ o’clock and ___ o’clock to ___ o’clock</th>
<th>Specific farming activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>What period is the most idle within a day?</td>
<td></td>
</tr>
</tbody>
</table>
Fertilization

1. You would apply about _____ kg. of chemical fertilizer each time to the crop and the expense is about ______.

2. What kinds of chemical fertilizer would you apply? ________ A. formula fertilizer  B. slow-release fertilizer  C. common fertilizer  D. other

3. Usual fertilization time is______________

   How do you determine fertilization time? A. based on experiences  B. based on the notice of agro-tech station  C. others______________

4. How do you fertilize? (multi-choice)
   A. applying large amount of chemical fertilizer  B. mixing farmhouse fertilizer with chemical one  C. microbial fertilizer  D. organic fertilizer  E. formula fertilizer  F. long-acting slow-release fertilizer

5. Where do you buy chemical fertilizer?  A. agro-tech promotion station  B. agricultural material companies/dealers  C. fertilizer companies  D. others_____

6. Your fertilization technology is learned from__________.
   A. agro-tech promotion stations  B. agricultural material companies/dealers  C. fertilizer companies  D. large farms/leading producers  E. self-study

7. Are there subsidies to chemical fertilizer?  A. yes  B. no
   If yes, the subsidy amount is ________yuan per mu.
   Are you satisfied with the amount of subsidies? A. yes  B. no, because__________
   The subsidy amount you expect is______yuan per mu.

8. Would you like to accept new fertilization technology?  A. yes  B. no
   If no, what’s the reason? A. cost  B. benefits  C. customs

9. Do you have any more problems and recommendations on fertilization? ______________________

Pesticide spraying

1. The land you cultivate needs about ______ kg of pesticide? The time of fertilization is__________

2. The fertilization mode you adopt is  A. manual spraying  B. automatic spraying  C. other

3. Are there subsidies to pesticide?  A. yes  B. no
   If yes, the amount of subsidies is__________yuan per mu.

4. Have you adopted physical and biological prevention and control measures against crop pests?  A. yes   B. no  If yes, they are ____________.

5. Would you like to invite a company for your pesticide application?
   A. yes  B. no, because__________________________
   If yes, you will pay______yuan.

6. Do you have any more problems and recommendations on pesticide? ______________________
SA Questionnaire on WB Loan Guangdong Agricultural NPS Control Project  
(for breeding farmers)

Domicile: _____ _______municipality (prefecture) _____county/city/district  
___________ township/town/______ village/neighborhood committee

Investigator: _________________ Time: 2012.xx.xx

II. Basic information of the family (fill in the information or put “√” against your choice)

<table>
<thead>
<tr>
<th>Name:</th>
<th>Gender:</th>
<th>Age:</th>
<th>Race:</th>
<th>Occupation: (1) farmer (2) worker (3) owner of enterprise (4) employee (5) household woman (6) other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) &lt;3 (2) 3-5 (3) 6-9 (4) &gt;10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of family members:</th>
<th>Educational level: (1) illiteracy (2) junior school (3) middle school (4) secondary specialized school (5) junior college school (6) university and higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) young (2) middle aged (3) elder (4) women (5) employee</td>
<td></td>
</tr>
</tbody>
</table>

Last year’s income of your family is about___ yuan, daily expense is about____ yuan.  

II. Your understanding level to the project (put “√” against your choice)

1. Do you know about the WB ANP control project?  
   A. yes B. no

1. Where did you know about this project?  
   A. government propaganda or notice B. agro-tech promotion center C. neighborhood D. others____

3. Are you willing to participate the NPS pollution control project?  
   A. yes B. no C. not care

4. Have you been enrolled in the project?  
   A. yes B. no C. don’t know how to participate the project

5. What impact do you hope the project would bring about? (multi-choice)  
   A. raising yield and increase income B. improving production technologies such as those in fertilization and pesticide application. C. lifting mechanization level D. increasing subsidies E. reducing diseases and epidemics F. creating job opportunities and improving
social security  G. enhancing ecological protection awareness

6. Have you any problem and recommendation about the project?

________________________________________

(You can put out your problems and recommendation in these aspects like subsidies and technology promotion etc.)

III. Breeding

1. The land area of your breeding farm is _______ mu, including the construction area of _______ M², the fish pound area of_____ M² and the farm land of_____ mu.

   The main species of livestock and poultry are _______________. The annual yield is about______.

2. The land you of your at present is______. A. self-owned   B. rented


   The machines you use are ______________. A. self-bought with a cost of____ yuan   B. rented with annual rent of _____ yuan.

4. Main sources of the feed are:

   A. commodity feed   B. farmhouse residues   C. mixture of commodity feed and farmhouse residues

5. Have your family constructed methane-generating pits?   A.yes, ____pits, _____ M³ in total, with a construction cost of ______yuan   B.no

6. The methane generated by the pits is mainly used for   A. household consumption(cooking etc.)   B. production (heating etc.)   C. other______.

7. If the methane is used for power generation?   A.yes, a _____KW generator   B.no

   If yes, is the power supply sufficient or not?   A. sufficient, how to exhaust the surplus methane? _________   B.insufficient

8. How to dispose the animal manure and wastewater of the breeding farm?

   A. piling and discharging randomly   B. putting into methane-generating pits for resource recycle   C. producing organic fertilizer   D. other innocuous treatment

9. Have you adopted ecological breeding mode?

   A.yes   B.no

10. Have you constructed ecological cycle system (wastewater treatment facilities)?

    A.yes, equipment investment amounting to__________yuan   B.no

11 Your technologies are learned from__________.

   A.government-organized training   B.self-study   C.tour study   D.experiences in breeding operation
12. Would you like to accept new breeding technologies?  A. yes  B. no

   If no, what’s the reason?  A. cost  B. benefits  C. customs

13. How do you think about the development trend of the future production?
   A. production of scale  B. mechanized operation  C. others

14. Do you have a plan to expand your breeding farm?  A. yes  B. no

15. Do you have sufficient financial support?  A. yes, with estimated investment
   of_______yuan  B. no

16. If the project needs you to assume a part of the construction cost accordingly
   in addition to the financial subsidies and technical support provided by WB,
   are you still willing to participate it?
   A. yes  B. no, because_____________

   Do you think how much subsidies would be more appropriate?  ____% 

17. Do you think what is the main obstacle to hinge your development at present?
   A. short of investment funds  B. short of technology related
   C. short of space for production of scale  D. short of good marketing channels  E. others

18. Do you hope in which aspects this project would bring about benefit to you?
   ________________________________
Stage III (3 copies, taking Niujiang Township of Enping City for example)

SA Questionnaire on Niujiang Township, Enping City
(Crop system: Rice-Rice-Potatoes)

I. Basic information (fill in the information or put “√” against your choice)

<table>
<thead>
<tr>
<th>Name or title of enterprise</th>
<th>Scale of cultivation</th>
<th>village/neighborhood committee</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

II. Chemical fertilizers you usually use and the price (per mu per time)

<table>
<thead>
<tr>
<th>Varieties</th>
<th>Urea</th>
<th>Compound fertilizer</th>
<th>Phosphorus fertilizer</th>
<th>Potash fertilizer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount (kg)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Unit price (yuan/kg)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Total price</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

III. Are you willing to adopt new fertilization technologies and accept subsidies accordingly

<table>
<thead>
<tr>
<th>Varieties of technologies</th>
<th>Fertilization standard</th>
<th>Cost of new technology</th>
<th>Amount of subsidies</th>
<th>Yes</th>
<th>No (Please answer question 4 and question 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Formula fertilizer</td>
<td>According to the standards of 40kg/mu/time for rice and 100kg/mu/time for potatoes, 180kg of formula fertilizer is in need for 3 times</td>
<td>About 576 yuan/year</td>
<td>Annual subsidy rate of 25% (144 yuan)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Year on year reduction of 5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Slow release fertilizer</td>
<td>According to the standards of 40kg/mu/time for rice and 120kg/mu/time for potatoes, 200kg of slow release fertilizer is in need for 3 times</td>
<td>About 640 yuan/year</td>
<td>1st year subsidy 25% (160 yuan)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Year on year reduction 5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subsidy mode
Report cultivation area to the township agriculture office --- buy fertilizer at the assigned stores by showing discount coupons --- sign on the list.

Specific subsidy standard
A participant can enjoy a discount 25% the first year, 20% the 2nd year, 15% the 3rd year, for 5 years consecutively the most.
IV. If you don’t like to adopt new fertilization technology, what’s the main reason? (multi-choice)
A. worrying about the effect of new fertilizer  B. inconvenience of buying fertilizer with discount coupons  C. low amount of subsidies  D. others_______

V. If disagreeing with the amount of subsidies, what proportion can you agree with to the minimum?
A. 30%  B. 40%  C. 50%  D. other____%

VI. With respect to above mentioned subsidy method and amount, do you have any better suggest?

VII. Are you willing to adopt new pesticide technology and accept subsidies for disease-resistant varieties of seeds?

<table>
<thead>
<tr>
<th>Pesticide subsidy</th>
<th>Standard</th>
<th>Mode</th>
<th>Yes</th>
<th>No (reasons)</th>
<th>Any more better methods and proposals?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease-resistant varieties subsidy</td>
<td>Rice</td>
<td>For disease-resistant varieties of rice seeds, the subsidies would be 5 yuan per mu, per time, per year for 2 years</td>
<td>① Report cultivation area to the township agricultural office; ② The office issues vouchers for buying disease-resistant varieties of rice seeds; ③ Buy rice seeds from the assigned stores with vouchers that can deduct cash directly.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

VII. What kind of pesticide you use normally? The name: 1. ________ (dosage/mu/time)  2. ________ (dosage/mu/time)  3. ________ (dosage/mu/time)

IX. Are you willing to accept following subsidies and use biological and high-effective and low-toxic pesticide?

<table>
<thead>
<tr>
<th>Varieties of fertilizer</th>
<th>Subsidy standard</th>
<th>Subsidy mode</th>
<th>Yes</th>
<th>No (reasons)</th>
<th>Do you have any other better mode and suggest</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological fertilizer and high-toxic fertilizer</td>
<td>Rice 2 times of spraying a year, 240 yuan per mu, subsidies account for 1/3 of the total cost, amounting to 80 yuan/mu per year.</td>
<td>① Report cultivation area to the township agricultural office; ② The office issues discount vouchers for buying pesticide; ③ Buy the listed</td>
<td></td>
<td></td>
<td>No subsidies would be offered to those enterprises, cooperative, large-scale and small crop farmers who have participated the integrated</td>
<td></td>
</tr>
</tbody>
</table>
Potatoes 4 times a year and 180 yuan per mu, subsidies account for 1/3 of the original cost, equaling to 60 yuan/mu per year.

- biological and low-toxic pesticide from assigned stores with discount vouchers.

<table>
<thead>
<tr>
<th>Potatoes</th>
<th>Subsidy mode</th>
<th>prevention and control system.</th>
</tr>
</thead>
</table>

**X. Are you willing to accept the subsidies to pesticide package waste recovery and treatment?**

<table>
<thead>
<tr>
<th>Subsidy items</th>
<th>Subsidy standard</th>
<th>Subsidy mode</th>
<th>Yes</th>
<th>No (reasons)</th>
<th>Any more better methods and proposals?</th>
</tr>
</thead>
<tbody>
<tr>
<td>subsidies to pesticide package waste recovery and treatment</td>
<td>Rice 4 yuan per mu, per year</td>
<td>Integrated prevention and control companies, cooperatives and large-scale vegetable farms can negotiate with pesticide package waste recovery and treatment companies to settle their accounts of the recovery directly</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**XI. The pesticide sprayers you usually use are**

A. motorized jet sprayer  
B. hand sprayer  
C. knapsack sprayer  
D. other ________

**XII. Are willing to accept the subsidies for pesticide equipment purchase? (Please make choice based on your actual situation)**

1) You belong to

A. an integrated prevention and control company  
B. a cooperative  
C. a large-scale vegetable market  
D. a large-scale crop farm  
E. a small crop farm

2) Does currently-used motorized jet sprayer enjoy subsidies?

A. yes, ________ yuan  
B. no

<table>
<thead>
<tr>
<th>Varieties</th>
<th>Subsidy standard</th>
<th>Subsidy mode</th>
<th>Yes</th>
<th>No (reasons)</th>
<th>Any more better methods and proposals?</th>
</tr>
</thead>
</table>
| Motorized jet sprayer | Unit price 1500 yuan, subsidy 1/2, 750 yuan/set | ①Report cultivation area to the township agricultural office;  
②The office issues discount vouchers for buying pesticide equipment;  
③Buy the listed pesticide equipment from assigned | | | |
| Hand sprayer | Unit price 120 yuan, subsidy 1/2, 60 yuan/set | | | | |

95
stores with discount vouchers.

XIII. Are you willing to accept following subsidies?

| Item of subsidies | Subsidy standard | Subsidy mode | Yes | No (reasons) | Any more better methods and proposals?
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsidies for pest-trapping board</td>
<td>Potatoes 20 boards per mu, 2.5 yuan per board, 1 time a year (about 50 yuan/year)</td>
<td>① Report cultivation area to the township agricultural office; ②The office issues vouchers for buy the boards ③Buy boards with vouchers that can deduct cash directly.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

XIV. Are you willing to accept following subsidies for receiving integrated prevention and control service?

| Item of subsidies | Subsidy standard | Subsidy mode | Yes | No (reasons) | Any more better methods and proposals?
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsidies for integrated prevention and control service</td>
<td>Rice 40yuan/mu each time</td>
<td>① Report cultivation area to the township agricultural office; ②The office issues vouchers for integrated prevention and control service; ③Crop farmers deduct cash directly with the vouchers after receiving the service provided by the integrated prevention and control company provide.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Stage IV 世行项目社评问卷②：供种植散户填写（种植面积为 1–50 亩）
Stage IV. (For small households - planting area 1–50mu)

问卷编号: No.___ 调查地点: Location__市 City__县/市/区 County/City/District
镇 Town

调查员: Interviewer____ 调查时间 Time: 2013 年 月 日---Day---Month,

1. 基本情况（请填写信息或在选项上打 “√”）: Basic information

<table>
<thead>
<tr>
<th>姓名: Name</th>
<th>性别: Sex</th>
<th>年龄: Age</th>
<th>所属村/居委会: Village</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 家庭人口 Number of household members: ___人 persons，包括其中:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. 能务农或在外打工的家庭劳动力人数 Household member able to work on the farm or outside the farm: ___人 persons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. 在家务农的家庭成员人数 Household members who worked on the farm: ___人 persons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. 全职外出打工的家庭成员人数 Household members with full-time jobs outside the farm: ___人 persons</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[调查员: c 和 d 之和应小于 b, 否则要答题者说明。Interviewer: the sum of c and d should be less than b. If not, clarify with respondent.]

1.1 Household income 家庭收入

(2) 2012 年家庭总收入: Total family income in 2012 ____元 yuan，其中 including:
(3) 种植收入为 farming income______元 yuan
(4) 非务农总收入 total income from non-farm work ______元 yuan

[调查员: b 和 c 之和应不超过 a, 否则要答题者说明。Interviewer: the sum of b and c should not exceed a. If it exceeds a, clarify with the respondent.]

1.2 种植与土地情况 Cultivation and land use

a. 2012 年总耕作面积: Total crop land in 2012______亩 mu，其中:
b. 包括自用土地 including self-own land 自有土地面积______亩 mu;
c. 租用土地 Included land 租用面积______亩 mu

[b 和 c 之和应不超过 a, 若需要请答题者说明。Interviewer, b+c should not exceed a. Clarify with respondent, if needed.]

1.3 2012 年自种作物信息 Crop information in 2012. Please indicate the main crops you grew in 2012.

<table>
<thead>
<tr>
<th>主要作物种类 Main crop</th>
<th>种植面积（亩） Area (mu)</th>
<th>亩产量 （公斤） Yield per mu (kg)</th>
<th>Price sold (kg)</th>
<th>总收入（元） Total income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early paddy 早稻</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Late paddy 晚稻</td>
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</tbody>
</table>
马铃薯 Potato
玉米 Maize
梅菜 vegetable for preservation
瓜类 Melon
淮山粉葛 Chinese yam & arrow root
叶菜 Leafy vegetables
荔枝 Lichi

1.4 Farm Labor 务农劳力
2012 年你雇佣劳力了吗？In 2012, did you hire any farm labor? 有 Yes ___，没有 No ___ [go to next question]
如果有 If yes, how many people did you hire? 请了多少人？__人 persons
每天每人工资多少 At what daily rate? ___ yuan per person per day
总共请了多少个工日 For how many man days in total __ 人/日 man days
雇工的主要任务是 What were the main tasks of the hired labor? ______________

1.5 Production Costs 生产成本
2012 年总成本（元）包括种子、化肥、农药、人工、地租、维护 _____元
Total cost in 2012, including seeds, fertilizers, pesticides, labor, land rental, and maintenance. _____元 Yuan
2012 年化肥总费用，包括粪肥 Total cost of fertilizers (including manure) in 2012 ___元 Yuan
2012 年农药总费用 Total cost of pesticides in 2012 ___元 Yuan

2. 对于环境污染的态度
Attitudes towards the Environment. [调查员 Interviewer: 请写下回答内容 please write down the respondent’s answers]

2.1 在您看来，本村面临的最紧迫的三个问题是什么？可以列举任何方面的问题。
In your view, what are the three most pressing problems facing your village. You may name problems of any nature.

________________________________________________
________________________________________________
________________________________________________

2.2 在您看来，本村面临的最紧迫的两个环境或生态问题是什么？请侧重环境
和生态方面。  
In your view, what are the two most pressing environmental or ecological problems facing your village. Please focus on environmental and ecological issues.

3、化肥使用情况 Fertilizer use

Please indicate which fertilizers and the fertilizer quantities that you used for your main crops in 2012. Specify the amount in kilograms per harvest. 请说明 2012 年你所种植的主要作物使用的化肥及其数量，注明每造的化肥使用公斤数量。[调查员：如果农户一年种植某种作物，比如玉米两造或者三造，只要其说明一造的化肥使用公斤数量即可，而不是全年的数。Interviewer: in cases where the farmers grows a crop, for example maize, twice or three times during the year, he should give the kilogram for only one harvest, not the entire year.]

<table>
<thead>
<tr>
<th>主要作物种类 Main crop</th>
<th>尿素 Urea (公斤/每造 kg/crop)</th>
<th>复合肥 Compound fertilizer (公斤/每造 kg/crop)</th>
<th>磷肥 Phosphate (公斤/每造 kg/crop)</th>
<th>钾肥 Potassic fertilizer (公斤/每造 kg/crop)</th>
<th>其他: Other: (公斤/每造 kg/crop)</th>
<th>有机肥 Organic fertilizer (粪肥 manure) (公斤/每造 kg/crop)</th>
<th>配方肥 Formula fertilizer (公斤/每造 kg/crop)</th>
<th>缓释肥 Slow release fertilizer (公斤/每造 kg/crop)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early paddy 早稻</td>
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<tr>
<td>Late paddy 晚稻</td>
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<tr>
<td>马铃薯 Potato</td>
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<td></td>
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<tr>
<td>玉米 Maize</td>
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<tr>
<td>梅菜 vegetable for preservations</td>
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<td></td>
<td></td>
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<tr>
<td>瓜类 Melon</td>
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</tbody>
</table>
### Main crop

<table>
<thead>
<tr>
<th>Main crop</th>
<th>Brand name (ml/mu)</th>
<th>Brand name (ml/mu)</th>
<th>Brand name (ml/mu)</th>
<th>Brand name (ml/mu)</th>
<th>Brand name (ml/mu)</th>
<th>Brand name (ml/mu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early paddy 鹅稻</td>
<td></td>
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<tr>
<td>Late paddy 晚稻</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>马铃薯 Potato</td>
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<td></td>
</tr>
<tr>
<td>玉米 Maize</td>
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<tr>
<td>梅菜 vegetable for preservation</td>
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<tr>
<td>瓜类 Melon</td>
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<tr>
<td>淮山粉葛 Chinese yam &amp; arrow root</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>叶菜 Leafy vegetables</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>荔枝 Lichi</td>
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</tbody>
</table>

#### 4.1 2012 年您有没有参与统防统治？In 2012, did you engage a company for integrated pest prevention and control?
A. 有 Yes (请回答题 4.2 If yes, please answer question 4.2)  B. 没有 No (请回答题 4.3 If no, please answer question 4.3)

#### 4.2 如果有，是为哪种作物参加统防统治的？
If yes, for which crops did you use the service?
请问您的费用是每造每亩_______元，What is the cost per crop per mu? ____ Yuan

What was the total cost of this service for you in 2012? 2012 年你参加统防统治的总费用是多少？______________元 Yuan

4.3 2012 年请问您有没有使用过高效低毒农药? In 2012, did you apply high efficiency and low toxicity pesticides? [调查员：向答题者出示并读卡片，解释高效低毒农药 Interviewer: show and read a card to the respondent explaining what high efficiency low toxicity pesticides are.]

A. 有 Yes （请回答题 4.4 If yes, please answer question 4.4） B. 没有 No （请回答题 4.5 If no, please answer question 4.5）

4.4 在 2012 年，你的哪种作物使用过高效低毒农药? On which crops did you use high efficiency and low toxicity pesticides in 2012? [调查员：记录作物名称 Interviewer, write down the crop names.]

_________________, _________________, ______________________

4.5 在 2012 年你用过生物农药吗？In 2012 did you use biological pesticides? [调查员：请出示卡片并解释生物农药 Interviewer: show and read a card explaining what biological pesticides are.]

A. 有 Yes（请回答题 4.6 If yes, please answer question 4.6） B. 没有 No（请回答题 4.7 If no, please answer question 4.7）

4.6 2012 年哪种作物你使用了生物农药 On which crops did you use biological pesticides in 2012? [调查员：记录作物名称 Interviewer, write down the crop names.]

_________________, _________________, ______________________

5. Project Description 项目介绍

以下这段话请调查员告诉受访者：[Interviewer, read this statement to the farmer.]

Both the national and provincial government give high attention to the contamination of soil and water by leakage of pesticides and fertilizers, so Guangdong Agriculture Department has developed better fertilizer and pest management technologies to reduce environmental contamination with precondition of yield guarantee. A project to promote these technologies will begin in early 2014. For the small producers (1-99 mu) the project activities are: Better fertilization (either formula fertilizer or slow-release fertilizer) and better pest management (a combination of recommended biological pesticide and highly efficient low toxic pesticide). Participation is completely voluntary. Households can sign up for either better fertilization or better pest management or both.

The Provincial Agricultural Department is currently developing a subsidy standard for each of these technologies. These subsidies will be reflected in the discounted price when the farmer goes to the agricultural input supply store to buy the fertilizer and the pesticide. Participating farms may not use on their land any other
fertilizers if they selected a better fertilization technology or any other pesticide if they select the better pest management technology. Also participating farmers must strictly apply the prescribed doses at prescribed times. They will be given training on proper application methods. If a household is found to be not compliant with the methods it will be excluded immediately from the project. Furthermore, in each village, a verification system will be put in place. If it is found that all participating farmers in a village are compliant, the village will be given a reward.

**Willingness to accept**

So far the subsidy standards have not been decided. The Department of Agriculture wishes information on your willingness to accept. The below table provides the market price, application standard, approximate cost of the new fertilizer and pesticide technologies. Please review the table and for each crop you grow, indicate the minimum level of subsidy that you are willing to accept. You may also indicate that you do not wish to apply a new technology to one, two or all of your crops, regardless of the subsidy offered. The Department of Agriculture needs honest expression of your preferences. In indicating the preferred subsidy levels, please also keep in mind that the Department of Agriculture’s budget is limited. Therefore, if the participants require too high a subsidy, the project will most likely not be implemented.

You will be asked first about your preferences regarding the fertilization methods and then the pest control method.

**5.1 Fertilizer technologies 施肥技术**

For paddy, potato and maize, [调查员：只提及答题者有的作物 interviewer, mention only the crop the respondent grows], you have three choices. You can either select formula fertilizer at a subsized price, or slow-release fertilizer at a subsidized price, or you can continue to apply your current practice at the current, unsubsidized market prices. Please look at the table for each crop and tell us level of subsidy you would require to opt for formula fertilization and what level of subsidy you would require for slow-release fertilization. If you would not opt for either of the new technologies regardless of how high the subsidy is, please tick the relevant box. If you would not select either of the new technologies, please tick both boxes. This would mean that you will stay with your current technology. Repeat this selection for the other crops.

[Interviewer, show each relevant table to the respondent.]
### 水稻 Paddy

<table>
<thead>
<tr>
<th>技术类别</th>
<th>肥料用量标准</th>
<th>新技术成本</th>
</tr>
</thead>
<tbody>
<tr>
<td>配方肥</td>
<td>40-45kg/公顷</td>
<td>0% [0元]</td>
</tr>
<tr>
<td>Slow-release fertilizer</td>
<td>40kg/公顷</td>
<td>0% [0元]</td>
</tr>
</tbody>
</table>

Which of these levels of subsidy are you willing to accept? 你愿意接受的补贴水平是哪种？

<table>
<thead>
<tr>
<th>I don’t want to apply this technology regardless of the subsidy level offered 无论补贴多少，我不愿意使用该新技术</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% [0元]</td>
</tr>
<tr>
<td>10% [14-16元]</td>
</tr>
<tr>
<td>20% [28-32元]</td>
</tr>
<tr>
<td>30% [42-48元]</td>
</tr>
<tr>
<td>40% [57-65元]</td>
</tr>
<tr>
<td>50% [72-81元]</td>
</tr>
<tr>
<td>60% [86-97元]</td>
</tr>
<tr>
<td>70% [101-113元]</td>
</tr>
<tr>
<td>80% [115-130元]</td>
</tr>
<tr>
<td>90% [130-146元]</td>
</tr>
<tr>
<td>100% [144-162元]</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer: write down the response.]

### 马铃薯 Potato

<table>
<thead>
<tr>
<th>技术类别</th>
<th>肥料用量标准</th>
<th>新技术成本</th>
</tr>
</thead>
<tbody>
<tr>
<td>配方肥</td>
<td>100kg/公顷</td>
<td>0% [0元]</td>
</tr>
</tbody>
</table>

你愿意接受的补贴水平是哪种？ Which of these levels of subsidy are you willing to accept? [每种作物和技术——选择 Select one only for each crop and each technology] 无论补贴多少，我不愿意使用该新技术 I don’t want to apply this technology regardless of the subsidy level offered

<table>
<thead>
<tr>
<th>I don’t want to apply this technology regardless of the subsidy level offered 无论补贴多少，我不愿意使用该新技术</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% [0元]</td>
</tr>
<tr>
<td>10% [36元]</td>
</tr>
<tr>
<td>20% [72元]</td>
</tr>
<tr>
<td>30% [108元]</td>
</tr>
<tr>
<td>40% [144元]</td>
</tr>
<tr>
<td>50% [180元]</td>
</tr>
<tr>
<td>60% [216元]</td>
</tr>
<tr>
<td>70% [252元]</td>
</tr>
<tr>
<td>80% [288元]</td>
</tr>
<tr>
<td>90% [324元]</td>
</tr>
<tr>
<td>100% [360元]</td>
</tr>
</tbody>
</table>
能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer, write down the response.]

### 玉米 Maize

<table>
<thead>
<tr>
<th>种类</th>
<th>肥料用量标准</th>
<th>新技术成本</th>
<th>你愿意接受的补贴水平是哪种? Which of these levels of subsidy are you willing to accept? [每种作物和技术——选择 Select one only for each crop and each technology]</th>
</tr>
</thead>
<tbody>
<tr>
<td>配方肥</td>
<td>100kg/亩·季 kg/ harvest.mu</td>
<td>360 元/亩·季 yuan/ harvest.mu</td>
<td>0% [0 元] 10% [36 元] 20% [72 元] 30% [108 元] 40% [144 元] 50% [180 元] 60% [216 元] 70% [252 元] 80% [288 元] 90% [324 元] 100% [360 元]</td>
</tr>
<tr>
<td>缓（控）释肥</td>
<td>70kg/亩·季 kg/ harvest.mu</td>
<td>280 元/亩·季 yuan/ harvest.mu</td>
<td>0% [0 元] 10% [28 元] 20% [56 元] 30% [84 元] 40% [112 元] 50% [140 元] 60% [168 元] 70% [196 元] 80% [224 元] 90% [252 元] 100% [280 元]</td>
</tr>
</tbody>
</table>

对于梅菜、山药、叶菜和荔枝，只有配方肥适用。请参照你自己的作物，说明你能接受参与项目的最低补贴标准。你也可以指出，无论补贴多少，你不愿意在某一种作物使用配方肥。For vegetables for preservation (梅菜), melons, Chinese yam, leafy vegetables, and lichi only formula fertilizers are applicable. Please indicate the minimum subsidy level you would be willing to accept for each crop you grow. If you are not willing to apply formula fertilization of a crop regardless of the subsidy offered, please indicate. [调查员，请将相应
作物表格出示给答题者，忽略其他作物 Interviewer, the respondent should only respond regarding the crop that he grows. Skip the other crops.]

梅菜 vegetable for preservation

<table>
<thead>
<tr>
<th>技术类别 Varieties of technologies</th>
<th>肥料用量标准 Application standard</th>
<th>新技术成本 Cost of new technology</th>
<th>Which of these levels of subsidy are you willing to accept? 你愿意接受的补贴水平是哪种？</th>
</tr>
</thead>
<tbody>
<tr>
<td>配方肥 Formula fertilizer</td>
<td>40kg/造・亩 kg/ harvest.mu</td>
<td>144 元/造・亩 yuan/ harvest.mu</td>
<td>0% [0 元]  10% [14 元]  20% [28 元]  30% [42 元]  40% [57 元]  50% [72 元]  60% [86 元]  70% [101 元]  80% [115 元]  90% [130 元]  100% [144 元]</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer: write down the response.]

瓜类 Melon

<table>
<thead>
<tr>
<th>技术类别 Varieties of technologies</th>
<th>肥料用量标准 Application standard</th>
<th>新技术成本 Cost of new technology</th>
<th>Which of these levels of subsidy are you willing to accept? 你愿意接受的补贴水平是哪种？</th>
</tr>
</thead>
<tbody>
<tr>
<td>配方肥 Formula fertilizer</td>
<td>50kg/造・亩 kg/ harvest.mu</td>
<td>180 元/造・亩 yuan/ harvest.mu</td>
<td>0% [0 元]  10% [18 元]  20% [36 元]  30% [54 元]  40% [72 元]  50% [90 元]  60% [108 元]  70% [126 元]  80% [144 元]  90% [162 元]  100% [180 元]</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer: write down the response.]
### Chinese Yam

<table>
<thead>
<tr>
<th>技术类别</th>
<th>肥料用量标准</th>
<th>新技术成本</th>
<th>Which of these levels of subsidy are you willing to accept? 你愿意接受的补贴水平是哪种?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varieties of technologies</td>
<td>Application standard</td>
<td>Cost of new technology</td>
<td>I don’t want to apply this technology regardless of the subsidy level offered 无论补贴多少, 我不愿意使用该新技术</td>
</tr>
<tr>
<td>配方肥</td>
<td>Formula fertilizer</td>
<td>100kg/造 ·亩 kg/ harvest.mu</td>
<td>360 元/造 ·亩 yuan/ harvest.mu</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer: write down the response.]

### Leafy vegetables

<table>
<thead>
<tr>
<th>技术类别</th>
<th>肥料用量标准</th>
<th>新技术成本</th>
<th>Which of these levels of subsidy are you willing to accept? 你愿意接受的补贴水平是哪种?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varieties of technologies</td>
<td>Application standard</td>
<td>Cost of new technology</td>
<td>I don’t want to apply this technology regardless of the subsidy level offered 无论补贴多少, 我不愿意使用该新技术</td>
</tr>
<tr>
<td>配方肥</td>
<td>Formula fertilizer</td>
<td>100kg/造 ·亩 kg/ harvest.mu</td>
<td>360 元/造 ·亩 yuan/ harvest.mu</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer: write down the response.]

### Lichi

<table>
<thead>
<tr>
<th>技术类别</th>
<th>肥料用量标准</th>
<th>新技术成本</th>
<th>Which of these levels of subsidy are you willing to accept? 你愿意接受的补贴水平是哪种?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varieties of technologies</td>
<td>Application standard</td>
<td>Cost of new technology</td>
<td>I don’t want to apply this technology regardless of the subsidy level offered 无论补贴多少, 我不愿意使用该新技术</td>
</tr>
<tr>
<td>配方肥</td>
<td>Formula fertilizer</td>
<td>100kg/造 ·亩 kg/ harvest.mu</td>
<td>360 元/造 ·亩 yuan/ harvest.mu</td>
</tr>
</tbody>
</table>
补贴多少，我不愿意使用该新技术

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer: write down the response.]

<table>
<thead>
<tr>
<th>配方肥</th>
<th>150kg/亩・亩</th>
<th>540元/亩・亩</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula fertilizer</td>
<td>kg/ harvest.mu</td>
<td>yuan/ harvest.mu</td>
<td>[0元]</td>
<td>[54元]</td>
<td>[108元]</td>
<td>[162元]</td>
<td>[216元]</td>
<td>[270元]</td>
<td>[324元]</td>
<td>[378元]</td>
<td>[432元]</td>
<td>[486元]</td>
<td>[540元]</td>
</tr>
</tbody>
</table>
5.2 推荐的生物农药和高效低毒农药

**Recommended biological pesticide and high efficient low toxic pesticide.**

Please indicate the minimum subsidy level you would be willing to accept to use this technology for each of the crops you grow. Note the subsidy is paid per crop NOT per year. Please indicate the minimum subsidy level you would be willing to accept for each crop you grow. If you are not willing to this technology to a crop regardless of the subsidy offered, please indicate. Interviewer, the respondent should only respond regarding the crop that he grows. Skip the other crops. Show the respondent the relevant tables.

**玉米 Maize**

<table>
<thead>
<tr>
<th>新技术成本</th>
<th>Which of these levels of subsidy are you willing to accept?</th>
<th>I don’t want to apply this technology regardless of the subsidy level offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of new technology</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>60 元/造·亩</td>
<td>0% [0 元]</td>
<td>10% [6 元]</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer: write down the response.]

**马铃薯 Potato**

<table>
<thead>
<tr>
<th>新技术成本</th>
<th>Which of these levels of subsidy are you willing to accept?</th>
<th>I don’t want to apply this technology regardless of the subsidy level offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of new technology</td>
<td>0%</td>
<td>10%</td>
</tr>
<tr>
<td>180 元/造·亩</td>
<td>0% [0 元]</td>
<td>10% [18 元]</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer: write down the response.]

__________

108
叶菜 leafy vegetable

<table>
<thead>
<tr>
<th>新技术成本</th>
<th>Cost of new technology</th>
<th>Which of these levels of subsidy are you willing to accept? 你愿意接受的补贴水平是哪种？</th>
<th>I don’t want to apply this technology regardless of the subsidy level offered 无论补贴多少，我不愿意使用该新技术</th>
</tr>
</thead>
<tbody>
<tr>
<td>[180 元/造・亩 yuan/harvest.mu]</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>[0 元]</td>
<td>[18 元]</td>
<td>[36 元]</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer: write down the response.]

瓜类 melons

<table>
<thead>
<tr>
<th>新技术成本</th>
<th>Cost of new technology</th>
<th>Which of these levels of subsidy are you willing to accept? 你愿意接受的补贴水平是哪种？</th>
<th>I don’t want to apply this technology regardless of the subsidy level offered 无论补贴多少，我不愿意使用该新技术</th>
</tr>
</thead>
<tbody>
<tr>
<td>[180 元/造・亩 yuan/harvest.mu]</td>
<td>0%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>[0 元]</td>
<td>[18 元]</td>
<td>[36 元]</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer: write down the response.]

淮山 Chinese yam

<table>
<thead>
<tr>
<th>新技术成本</th>
<th>Cost of new technology</th>
<th>Which of these levels of subsidy are you willing to accept? 你愿意接受的补贴水平是哪种？</th>
<th>I don’t want to apply this technology regardless of the subsidy level offered 无论补贴多少，我不愿意使用该新技术</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

109
无论补贴多少，我不愿意使用该新技术

<table>
<thead>
<tr>
<th>新技术成本</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>180元/亩・亩</td>
<td>[0元]</td>
<td>[18元]</td>
<td>[36元]</td>
<td>[54元]</td>
<td>[72元]</td>
<td>[90元]</td>
<td>[108元]</td>
<td>[126元]</td>
<td>[144元]</td>
<td>[162元]</td>
<td>[180元]</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer write down the response.]

梅菜 vegetables for preservation

<table>
<thead>
<tr>
<th>新技术成本</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>180元/亩・亩</td>
<td>[0元]</td>
<td>[18元]</td>
<td>[36元]</td>
<td>[54元]</td>
<td>[72元]</td>
<td>[90元]</td>
<td>[108元]</td>
<td>[126元]</td>
<td>[144元]</td>
<td>[162元]</td>
<td>[180元]</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer write down the response.]

荔枝 lichi

<table>
<thead>
<tr>
<th>新技术成本</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>180元/亩・亩</td>
<td>[0元]</td>
<td>[18元]</td>
<td>[36元]</td>
<td>[54元]</td>
<td>[72元]</td>
<td>[90元]</td>
<td>[108元]</td>
<td>[126元]</td>
<td>[144元]</td>
<td>[162元]</td>
<td>[180元]</td>
</tr>
</tbody>
</table>

能否告知选择的主要原因 Could you please let us know the most important reason for your selection. [调查员请记录 Interviewer write down the response.]
5.3 上述化肥和农药的补贴计划采取以下的补贴方式：The subsidy arrangement for the above-mentioned fertilizer and pesticide subsidy plan is as below:

自愿报名 Application on voluntary basis——审查公示补贴对象 public disclosure of the verified applicants for subsidy——发放 IC 卡和《作物生产档案》 Issuance of IC card and <Crop Production Files>——凭 IC 卡，《作物生产档案》和上次使用后农药包装废弃物到指定农资店按折扣价购买 purchase at discounted price in the designated agricultural input supply store with IC card, <Crop Production Files> and the pesticide packing wastes of previous application ——在资料册上签名 sign off in the name list.

请问您是否愿意接受？Whether you accept or not？
A.愿意 Yes; B. 不愿意 No(如果不愿意,请回答题 5.4 If no, please answer question 5.4)

5.4 请问您不愿意接受上述补贴方式的理由是 The reason you don't accept the above-mentioned subsidy arrangement is as below:
A.补贴操作过程比较繁琐 Subsidy application procedures are rather complicated;
B. 担心不能拿到的补贴 Worry that the relevant subsidy will not be provided
C.担心指定农资店比较远，不方便 Worry that the agriculture input store is too far and inconvenient
D.回收农药包装废弃物有困难 It's difficult to collect the pesticide packing wastes
E.过程信息不够公开透明 The subsidy application process is not transparent enough
F.其他 other ____

5.5 Your suggestions about subsidy standards and subsidy arrangement?  ____

Supplementary: Information card showed during the survey

Explanation of new technical terms

**Formula fertilizer**
It refers to some special used fertilizer which was produced by specialists on the basis of crop habits, absorption regularity and the feeder capability. By applying formula fertilizer, not only the crop output can be improved, but also the improvement of fertilizer utilization rate, quality of agricultural products, work efficiency and production income can be realized.

**Slow (controlled) release fertilizer**
It refers to an insoluble, granulated fertilizer that releases nutrients gradually into the soil. The fertilizer granules may have an insoluble substrate or semi-permeable jacket
that prevents dissolution while allowing nutrients to flow outward. This slow (controlled) release fertilizer is of high usage, convenient, labor-saving and safe.

**Organic fertilizer**

It is commonly known as naturally occurring fertilizers, including various kinds of animal and plant residues or metabolic product, such as human and animal excreta, straw, animal remains. In addition, it also includes cake fertilizers (rape seed cake, cottonseed cake, bean cake, sesame seed cake, tea seed cake), compost, water-logged compost, farmyard manure, biogas manure, green manure, et al.

**Unified prevention and control**

It refers to an integrated pest management program which includes unified inspection, prevention and control on plant diseases and insect pests. This program is usually conducted by specialized companies.

**Biological pesticide**

It refers to a form of pesticide based on naturally occurring organisms and/or their metabolites including bacteria and other microbes, fungi, nematodes, proteins.

**High efficiency and low toxicity pesticide**

It refers to harmless and environmental friendly Pesticides with high efficiency in killing pests, such as d-chiro-inositol, chinomethionat, Buprofezin, et al, but they are safe to people and livestock.
Annex VI. Research report about the sites of project implementation at the first year

1 Introduction

1.1 Background and objective of this survey

For a better design and effective implementation of this World Bank project, a social impact assessment was conducted in this fourth round of survey. Since this project design has stepped into the late stage, the fourth round of survey will involve the issues of specific operation. Being focused on the project sites that will be carried out in the first year, the aim of this round of survey is to appraise the rationality of the latest subsidy program and peasant’s willingness to accept it. This will be used as a reference for setting a more scientific subsidy standard and scheme.

1.2 Schedule of survey

This round of survey started from 17 February, 2013 to 1 March, 2013. It was divided into four stages, which were pre-work communication and personnel training, preliminary survey, formal survey, and data analysis, respectively.

<table>
<thead>
<tr>
<th>Date</th>
<th>Work and activity</th>
<th>Participant</th>
<th>Person in charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb.17-Feb.18</td>
<td>● Recruitment of personnel&lt;br&gt;● Pre-work training&lt;br&gt;● Coordination and ComMunication</td>
<td>All training personnel</td>
<td>CaiLiru, Li Xuhan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Preliminary survey (Visiting 15 to 25 peasants by random selection at Yangcun Town, Boluo County)</td>
<td>Investigation team (4 persons)</td>
<td>CaiLiru, Li Xuhan</td>
</tr>
<tr>
<td>Feb.21 (Thursday)</td>
<td>● Teleconference (Communication with Tijen, expert of the World Bank)&lt;br&gt;● Refinement of questionnaire&lt;br&gt;● Additional survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb.22</td>
<td>survey at Yangcun Town, Boluo</td>
<td>Investigation</td>
<td>CaiLiru</td>
</tr>
<tr>
<td>(Friday)</td>
<td>County</td>
<td>team (6-8 persons)</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------</td>
<td>--------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Feb.23-Feb.24</td>
<td>Analysis of the existing questionnaires</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb.25</td>
<td>survey at Hengli Town, Huicheng District</td>
<td>Investigation team (6-8 persons)</td>
<td>CaiLiru</td>
</tr>
<tr>
<td>(Monday)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb.26</td>
<td>survey at Pingtan Town, Huiyang District</td>
<td>Investigation team (6-8 persons)</td>
<td>CaiLiru</td>
</tr>
<tr>
<td>(Tuesday)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feb.28</td>
<td>survey at Niu Jiang Town, Taishan city</td>
<td>Investigation team (6-8 persons)</td>
<td>Li Xuhan</td>
</tr>
<tr>
<td>(Thursday)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar. 1</td>
<td>survey at Cangcheng Town, Kaiping city</td>
<td>Investigation team (6-8 persons)</td>
<td>Li Xuhan</td>
</tr>
<tr>
<td>(Friday)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar.3-Mar.15</td>
<td>Data analysis, submission of research report to the World Bank</td>
<td>CaiLiru, Li Xuhan</td>
<td></td>
</tr>
</tbody>
</table>

2 Survey methods

2.1 Questionnaire design

The questionnaire used in this survey was composed of two parts, the formal questionnaire and information card.

The formal questionnaire (In the Supplementary 5, questionnaire of the fourth round) included the following five parts: Basic information (plant, land, labors engaged in production and cost); Attitude toward environment pollution; Usage of chemical fertilizer; Usage of pesticide; Projection introduction and willingness to accept subsidy. The information card (In the Supplementary 5, information card of the fourth round) included information that the investigators should explain to the interviewees during the survey process. It consisted of the explanation of new technical terms, options about subsidy information for new fertilizer, and options about subsidy information for biological pesticide and high efficiency and low toxicity pesticide.

2.2 Survey management

There were 10 persons take part in this round of survey. Of which, 5 males and 3 females were graduate students from local university. All of the investigators were trained to help them to know the background and purpose of this survey, understand the questionnaire design, obtain authentic information in a unified and scientific way. The training given before the survey included the following content:

- Introduction of project background and survey objective;
- Explanation of survey methods and regulations;
- Discussion about the questionnaire content and the specified order of questions;
2.3 Methods of sample selection

During this survey, we selected 5 towns (Pingtan, Hengli, Yangcun, Duhu, Cangcheng) from the 6 key towns, which would be the sites of project implementation at the first year, to do field research. The town of Niujiang was not included, because a detailed survey had been done at it. The number of samples selected at each town was determined by the proportion of the number of farmer household that were included in the project implementation at the first year compared to the total number of farmer household at the town. The figure was around 3%. According to the method of bottom-up participatory rural appraisal, this survey applied the methods of random sampling and one-to-one questionnaire interviews.

(1) Random sampling method
In each town, 4 to 6 villages were selected by random (most of the selected villages were project implementation sites at the first year). Investigators were divided into several groups to do the survey from door to door. If there was nobody at home, or the house-owner didn’t want to be researched, noted it down and went to the next household.

(2) Selection of farmer household
It was better that the interviewee selected is the head of a family, who has more power to make decision and fully understand the background of his/her family, income, information about what crops they plant, mode of fertilization and pesticide application. During the interview process, if investigator found the interviewee is not the household head, or there was some content that the interviewee himself/herself doesn’t know very well, the interview would be suspended and ask other members of this family to provide additional information.

(3) Fill in questionnaire
All of the questionnaires were filled in the one-to-one way. The investigator asked interviewee questions and fill in the questionnaire according to his/her response.

2.4 Preliminary survey

On 20 February, 2012, the survey team selected two villages (Zhuziyuan Village and Jinkou Village of Yangcun Town, Boluo County, Huizhou City) to make a preliminary survey. The method applied in this preliminary method was random sampling. 22 copies of questionnaire were issued, all the copies were returned, and there were 20 effective questionnaires. All of 20 respondents were private investor with plan area no more than 50 Mu (Mu, a unit of area, is equal to 0.0667 hectares). The detailed result of this preliminary was displayed in Supplementary 3. Based on the result of preliminary survey, we summed up the experiences and made some improvement of the formal questionnaire. The modification and refinement included the following aspects:

Summary
• The average time for each questionnaire was 25-30 minutes.
- Make sure the interviewee was the head of a family who has a full picture about his/her family before the interview.
- Make sure the crops planted by interviewees were included by the project subsidy before the interview.

Modification:
- Added the contact information and village group name of each interviewee.
- Did a position adjustment about the question of non-agricultural income, so as to make it easy for interviewees to give an accurate answer.
- Given to the fact that most interviewees were not very clear about the figure of their income, which needs a calculation of their non-agricultural income and the income from their crops, the question 1.1 (total income) was suggested to be deleted and broken down into smaller pieces.
- According to the habit of answering questions, the unit of crop output in each Mu was changed from Kilogram to Jin. The unit of sale price was changed from Yuan/per Kilogram to Yuan/per Dan (50 Kilograms).
- Added two items (field management and rent of machinery) to the question of 1.5.
- Summed up the options of the question 2.1 “the most pressing problems facing this village”, including labor shortage, high labor cost, water resource (irrigation water and drinking water) shortage; low income from planting crops, few channel of marketing; low-lever of mechanization; high price for fertilizer and pesticide; poor infrastructure (road, irrigation).
- Summarized the options for the question 2.2 “the most pressing environmental problems facing this village”, including littering rubbish; the problem of straw treatment; waste of pesticide packing materials; serious water and soil erosion.
- Added question 2.3: Do you think fertilization will pollute the surface water like river in your village?
- Added question 2.4: Do you think pest control and prevention will pollute the surface water like river in your village?
- According to the habit of answering questions by interviewees, the unit of chemical fertilizer usage amount was changed from Kilograml per Round to Jinl per Round per Mu.
- Added the name of high efficiency and low toxicity pesticide. Some peasants thought the pesticide they used belong to high efficiency and low toxicity pesticide. In fact, according to the name of pesticide they used, they did not use high efficiency and low toxicity pesticide.

3 Data analysis

3.1 Sample information

- Sample size
This survey focused on the private households. We issued 343 copies of questionnaire (the 22 copies of questionnaire during the stage of preliminary research were also included). 20 administrative villages in 5 key towns (Pingtan, Hengli, Yangcun, Duhu, Cangcheng) and 7 categories of crop system were included.

- **Effective questionnaire**

All of the 343 copies of questionnaire were returned, the number of valid and invalid copies were 310 and 11, respectively. The effective rate was 96%.

<table>
<thead>
<tr>
<th>Town name</th>
<th>Number</th>
<th>Village name</th>
<th>Number of the valid questionnaire</th>
<th>Number of the invalid questionnaire</th>
<th>Agricultural population</th>
<th>Total number of households</th>
<th>Percentage of questionnaire to household</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pingtan</td>
<td>1</td>
<td>Zhangxin</td>
<td>21</td>
<td>1</td>
<td>3219</td>
<td>685</td>
<td>3.1%</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Xinyu</td>
<td>16</td>
<td>1</td>
<td>1348</td>
<td>321</td>
<td>5.0%</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Guanghui</td>
<td>18</td>
<td>1</td>
<td>3061</td>
<td>605</td>
<td>3.0%</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Xingang</td>
<td>13</td>
<td>1</td>
<td>2661</td>
<td>483</td>
<td>2.9%</td>
</tr>
<tr>
<td>Hengli</td>
<td>5</td>
<td>Hengxing</td>
<td>16</td>
<td>1</td>
<td>2220</td>
<td>484</td>
<td>3.3%</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Liantang</td>
<td>27</td>
<td>1</td>
<td>1545</td>
<td>352</td>
<td>7.7%</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Lancun</td>
<td>8</td>
<td>2</td>
<td>687</td>
<td>157</td>
<td>5.1%</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Xincun</td>
<td>5</td>
<td>2</td>
<td>1743</td>
<td>418</td>
<td>1.7%</td>
</tr>
<tr>
<td>Yangcun</td>
<td>9</td>
<td>Shitan</td>
<td>10</td>
<td>1</td>
<td>1308</td>
<td>265</td>
<td>3.8%</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Licun</td>
<td>28</td>
<td>3</td>
<td>2573</td>
<td>497</td>
<td>5.6%</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Yanghe</td>
<td>19</td>
<td>2</td>
<td>1206</td>
<td>238</td>
<td>8.0%</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>Zhuziyuan*</td>
<td>10 *</td>
<td>2</td>
<td>1181</td>
<td>258</td>
<td>3.9%</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Jinkou*</td>
<td>10 *</td>
<td>2</td>
<td>1873</td>
<td>381</td>
<td>3.1%</td>
</tr>
<tr>
<td>Duhu</td>
<td>14</td>
<td>Xiaoshen</td>
<td>16</td>
<td>3</td>
<td>2681</td>
<td>710</td>
<td>2.7%</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Shencun</td>
<td>14</td>
<td>2</td>
<td>5290</td>
<td>1214</td>
<td>1.3%</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Guluo</td>
<td>25</td>
<td>1</td>
<td>2248</td>
<td>521</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>Yintang</td>
<td>12</td>
<td>1</td>
<td>2615</td>
<td>654</td>
<td>2.0%</td>
</tr>
<tr>
<td>Cangcheng</td>
<td>18</td>
<td>Liuhe</td>
<td>27</td>
<td>3</td>
<td>3565</td>
<td>924</td>
<td>2.9%</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>Tani*</td>
<td>16</td>
<td>2</td>
<td>4801</td>
<td>1250</td>
<td>1.4%</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>Xiawan</td>
<td>21</td>
<td>1</td>
<td>2366</td>
<td>628</td>
<td>3.3%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>330</td>
<td>13</td>
<td></td>
<td>11045</td>
<td>3.1%</td>
</tr>
</tbody>
</table>

Villages with * are those that had been investigated during the preliminary research.
The population data refers to the year of 2012.

- **Description of invalid questionnaire**

<table>
<thead>
<tr>
<th>Town name</th>
<th>Village name</th>
<th>Number of invalid questionnaire</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pingtan</td>
<td>Xingang</td>
<td>1</td>
<td>Interviewee quitted in the midway of interview</td>
</tr>
</tbody>
</table>
3.2 Basic information analysis of sample

- **Gender: male-dominated, the status of women was improved gradually**

Since cultivation is a labor-intensive work, man was the main labor force in most families. However, the survey also found that women become the main labor force gradually, with a percentage of 14%. This revealed the gradual improvement of women status in society and more social activity space.
Age: the average age of cultivation was 54

The survey result showed that the main labor force of cultivation in most families were old parents with average age of 54. Most of young people go out as migrant workers.

Family composition: the proportion of families with 4 labors accounted for 66% of the total

The average number of people for each family was 6, the labor number was 4, of which two labors were engaged in agriculture, the other two went out as migrant workers, most of them are young people who worked in the surrounding cities, with an annual per capital income of ¥17094.3.

Diagram of family composition of interviewees

Diagram of the gender distribution of interviewees

3.3 Analysis of cultivation and labor force

Average land area: 10.6 Mu in each farmer household
Diagram of land cultivation in farmer households

Most objects of this survey were private farmer households, which have an average cultivation land area of 10.6 Mu. 70% of them had private land with an average area of 6 Mu, the remaining 30% of farmer households rent some land, in addition to their own land. The land they rent was mainly from their neighbors or relatives.

- **Information of crops cultivation**

**Early season rice**

Among the 310 farmer households in this survey, there were 288 families planted early season rice, took up 92.9% of the total. The average plant area of early season rice was 8.1 Mu, with an average output of 701.31 Jin/Mu. Among the 288 families, the rice production of 13 families was not for sale. The average sale price of early season rice was ¥ 135.06/100 Jin (one Dan). As a result, the general income from planting early season rice for each family was ¥ 7672.23.

**Late season rice**

Among the 310 farmer households in this survey, there were 286 families planted late season rice, took up 92.26% of the total. The average plant area of late season rice was 9.71 Mu, a little more than that of early season rice. The average output of late season rice was 728.99 Jin/Mu. Among the 286 families, the rice production of 21 families was not for sale or had not yet been sold. The average price of late season rice was ¥ 155.89/100 Jin (one Dan). As a result, the general income from planting early season rice for each family was ¥ 11034.66.

In general, the average income from planting paddy rice for each farmer household was at a relatively low level, which was only ¥ 18707.29.
Comparison diagram about the cultivation of early season rice and late season rice

早稻: Early season rice; 晚稻: Late season rice
种植面积 (亩): Plant area (Mu); 亩产量 (斤): Output per Mu
出售价格: Sale price

Chinese yam and Pueraria thomsonii

Among the 310 farmer households in this survey, 35 families plated Chinese yam and Pueraria thomsonii. They were mainly distributed in Huiyang District. The average plant area of Chinese yam and Pueraria thomsonii was 5.81 Mu, with an average output of 3682.35 Jin. The average sale price was ¥ 317.94 /per Dan (100 Jin). The total income of families plant Chinese yam and Pueraria thomsonii was ¥ 68021.53, much higher than that of planting paddy rice.

Employment of labor force

The survey result showed that, most paddy farmer households (90.55%) did not employ any labors, because of factor of cost. Those who employed labors are households with larger area of cultivation, which took up 9.45%. The period of employment was the harvest time of early season rice and late season rice, which fall in March to April, and Mid-October. The main work was seedling-throwing and rice transplanting.

As for those plant Chinese yam and Pueraria thomsonii, the period of employment was the late December. Since the income from planting Chinese yam and Pueraria thomsonii was more considerable, the salary paid to employees is also relatively higher.

Statistical table of labor force employed by farmer household
<table>
<thead>
<tr>
<th>Employment period</th>
<th>Main work</th>
<th>Number of employment (person)</th>
<th>Work days (day)</th>
<th>Salary (¥)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Late December</td>
<td>Digging Chinese yam and Pueraria thomsonii</td>
<td>2</td>
<td>22</td>
<td>150</td>
</tr>
<tr>
<td>Harvest season of early and late rice</td>
<td>seedling-throwing rice transplanting</td>
<td>5</td>
<td>1</td>
<td>86</td>
</tr>
</tbody>
</table>

### 3.4 Analysis of cultivation cost

The survey result showed that the total cultivation cost was ¥9994.93, which included the cost of crop seeds, chemical fertilizer, pesticide, labor force, land rent, field management, machinery rent. The two largest cost items were chemical fertilizer and pesticide, which were ¥5084.99 and ¥1558.75, respectively.

![Comparison diagram of cultivation cost](image)

**Comparison diagram of cultivation cost**

- 总成本: Total cost(yuan)
- 化肥: Fertilizer(yuan)
- 农药: Pesticide(yuan)

- **Cultivation cost of rice**

In the year of 2012, the average cultivation cost of paddy rice for each farmer household was
¥9371.5, which included the cost of rice seeds, chemical fertilizer, pesticide, labor force, land rent, field management, and machinery rent. Among which, the cost of chemical fertilizer and pesticide was ¥4636.11 and ¥1481.84, respectively.

![Comparison diagram of cultivation cost of paddy rice](image)

**Comparison diagram of cultivation cost of paddy rice**

**总成本**: Total cost (yuan)  **化肥**: Fertilizer (yuan)  **农药**: Pesticide (yuan)

In the view of cultivation cost in the unit of Mu and Round, the total cost of paddy rice per Mu and per Round was ¥487.22 in 2012. The cost of chemical fertilizer and pesticide was ¥241.25 and ¥77.63.

- **Cultivation cost of Chinese yam and Pueraria thomsonii**

In the year of 2012, the total cultivation cost of Chinese yam and Pueraria thomsonii was ¥20318.18. It included the cost of seeds, chemical fertilizer, pesticide, labor force, land rent, field management, and machinery rent. Among which, the cost of chemical fertilizer and pesticide was ¥12531.66 and ¥2523.53, respectively.
Comparison diagram of cultivation cost of Chinese yam and Pueraria thomsonii

In the view of cultivation cost in the unit of Mu and Round, the total cost of Chinese yam and Pueraria thomsonii per Mu and per Round was ¥1519 in 2012. The cost of chemical fertilizer and pesticide was ¥995.53 and ¥171.26.

Brief summary:

From the above comparative analysis, we can see that the average profit of planting paddy rice in each family was ¥9335.79 in the year of 2012.

The average profit of planting Chinese yam and Pueraria thomsonii in each family was ¥47703.35 in the year of 2012.

3.5 Analysis of interviewees’ attitude toward environmental pollution

- The most pressing problems facing this village

The survey result showed that 29.94% of interviewees think poor water quality is the most pressing problem, because of the pollution from nearby factories. The second most pressing problem was the poor infrastructure, it took up 17.20% of the total interviewees.
The most pressing environmental problems facing this village

The survey result also showed that 33.80% of interviewees think the most pressing environmental problem facing their villages is the pollution of pesticide package waste; the second and the third were poor treatment of garbage and domestic sewage, which took up 17.42% and 15.68%, respectively. The other main problems were pollution of water source region and poor water conservancy facilities.
Statistics diagram of views about the environmental problems

- 缺乏卫生设施: Lack of health facilities
- 垃圾处理不当: Poor management of garbage
- 稻秆焚烧污染: Pollution of straw burning
- 农药包装废弃物污染: Pollution of pesticide package
- 猪场废水污染: Pollution of waste water from pig farms
- 森林退化: Forest degradation
- 水土流失: Water and soil loss
- 生活污水排放: Domestic sewage discharge
- 其他: Others

● Views about whether the usage of chemical fertilizer and pesticide will pollute the surface water

The survey results showed that 74.5% of interviewees think the fertilizer will not contaminate the surface water, and 68.8% of interviewees think the use of pesticide will not pollute the surface water.

Views about the influence of using chemical fertilizer:

- 是, 25.50%
- 否, 74.50%

Views about the influence of using pesticide:

- 是, 31.2%
- 否, 68.8%
Statistics diagram of views about whether using fertilizer and pesticide will pollute the surface water (是: yes; 否: no)

3.6 Analysis about the use of fertilizer

Most interviewees of this survey planted paddy rice, the figure of rice farmer households was 289, accounting 93% of the total number. The main 4 types of chemical fertilizer being used were urea, compound fertilizer, phosphate fertilizer, and potassium fertilizer. The number of farmer households use urea and compound were 270 and 257, which took up 93.43% and 88.92% of the total. The average usage amount of these two kinds of fertilizer were 82.34 Jin per Mu per Round and 43.16 Jin per Mu per Round.

Moreover, the two recommended kinds of fertilizer by this project, formula fertilizer and slow release fertilizer, were also being used by some farmer households. There were 25 farmer households used the formula fertilizer, and 5 farmer households used slow release fertilizer. Usually, they were used in some proportions with other kinds of fertilizers. Therefore, the actual usage amount of these two kinds of fertilizer was less than the recommended usage. The figures of the actual usage amount were 79 Jin and 76 Jin. Regarding the evaluation of these new types of fertilizer, the results were mixed. About 45% of farmer households thought the benefit of new fertilizer is not obvious, while 55% of them with positive views.
Among the 32 farmer households plant Chinese yam and Pueraria thomsonii, the main fertilizer used by them were compound fertilizer and organic fertilizer, followed by phosphate fertilizer and urea. The usage amount of fertilizer was relatively high, with an average figure of 354.33 Jin/Mu and 814.40 Jin/Mu in the usage of compound fertilizer and organic fertilizer. However, no formula fertilizer and slow release fertilizer had been used.

**Information about the use of fertilizer by farmer households plant Chinese yam and Pueraria thomsonii (Unit: Jin)**

![Bar chart showing fertilizer usage](chart.png)

- 使用户数: Number of farmer households using fertilizer
- 每亩每造平均用量: The average usage amount per Mu Per Round
- 尿素: Urea
- 复合肥: Compound fertilizer
- 磷肥: Phosphate fertilizer
- 钾肥: Potassium fertilizer
- 有机肥: Organic fertilizer
- 配方肥: Formula fertilizer
- 缓释肥: Slow release fertilizer

Among the 15 farmer households plant corn, the main fertilizer used by them were compound fertilizer and organic fertilizer, followed by urea and phosphate fertilizer. The average usage amount of compound fertilizer and organic fertilizer were 178 Jin/Mu and 250 Jin/Mu. No formula fertilizer and slow release fertilizer had been used.
Among the 6 farmer households plant melons, the dominant used fertilizers were also compound fertilizer and organic fertilizer. The average usage of compound fertilizer was 145 Jin/Mu, while the figure of organic fertilizer was as high as 1060 Jin/Mu. No formula fertilizer and slow release fertilizer had been used.

Among the 4 farmer households plant leaf vegetables, the main fertilizer used by them were also compound fertilizer and organic fertilizer. The average usage amount of compound fertilizer and organic fertilizer were 175 Jin/Mu and 533 Jin/Mu. No formula fertilizer and slow release fertilizer had been used.
Among the 3 farmer households plant preserved flowering cabbage, the main fertilizer used by them were compound fertilizer, phosphate fertilizer and organic fertilizer. The figures of average usage amount were 366.67 Jin/Mu, 266.67 Jin/Mu, and 800 Jin/Mu. No formula fertilizer and slow release fertilizer had been used.

.7 Analysis about the use of pesticide

There were many types of pesticide used by interviewees in this survey. 37 different brands and types of pesticide were involved, their names are as follows:
Among the 289 farmer households involved in this survey, the most used pesticides were Validamycin, Bisultap, Dichlorvos, and so on. The usage amount of pesticide was mainly affected by personal experience and the recommendation of agricultural materials shop. Thus, some pesticides with mid-high level of toxicity were also being used. There were about 30% of interviewees who could not provide clear information about the type and usage amount of pesticide in 2012. For those people who could only tell how many times they had used pesticides and how much they paid. They did not know the name and amount of the pesticide they used, since the agricultural materials shop had made it up for them and they could use it directly.

With respect to unified prevention and control of pesticide, 9% of interviewees took part in this activity on paddy rice. In this survey, the average cost of unified prevention and control was ¥56/per Mu per Round. It was reported the cost would be increased to ¥80/per Mu per Round. 90% of interviewees made a positive evaluation of the effect of unified prevention and control, which can save cost and labor, and a crop reduction insurance was also included. However, they were not sure whether they would like to be involved if the price goes up.

Among the interviewees, 33.55% of them used the high-efficiency and low toxicity pesticides in the year of 2012. The main brands of these pesticides were Validamycin, Armure, Foggo, Emamectin, and so on. This indicated that the farmer households had realized the negative effect of pesticides on human and environment begin to change their habits of using pesticide. They said they could accept a relatively higher price of those high efficiency and low toxicity pesticide.

In addition, there was one interviewee said he had ever used biological pesticide, but he did not know its name. This indicated that biological pesticide is still new to peasants. It needed a further promotion.
### 3.8 Analysis about the farmer households’ willingness to subsidy

Most interviewees in this survey were rice farmer households, with a number of 289 (accounted for 93% of the total). As for the expected subsidy of fertilizer, the average wanted subsidy level was 25%. Among the interviewees, 41% of them selected no subsidy. 90% of those who selected no subsidy said they can accept no subsidy if the new technology is effective. In other word, 41% of farmer households did not care much about the subsidy, if the effect of new technology could be ensured and there would be no dramatic rise of fertilization cost.

The proportions of interviewees who chose subsidy level of 10%, 20% and 30% were 2.27%, 9.83%, and 18.71%, respectively. The reason for their selection lies in the fact that the subsidy could save their cost. The percentages of those who chose subsidy level of 40%, 50%, and 60% were 7.75%, 11.15%, and 3.02%, respectively. The main reasons for their selections are as follows: thinking the subsidy is moderate; worrying about the effect is not very good; feeling insured with a high subsidy level. For those who chose the subsidy level of 70% and did not want to accept subsidy, the proportions were 3.59% and 3.02%, respectively. Because they worried about the risk of a negative effect on the crop output caused by new technology, or they had seen the application of new technology by other people, but the crop output was not as good as expected.

#### Statistical diagram of proportions about the selection level on fertilizer and new technology by farmer households plant rice

![Diagram showing the proportions of subsidy levels chosen by farmer households.](image)

Regarding to the subsidy on the use of high efficiency and low toxicity pesticide for rice planting families, the average wanted subsidy level was 41%. 33% of interviewees chose the option of no subsidy, 85% of those who chose do not want subsidy said they would like to try the new technology if there is no sharp rise of cost, and they thought the effect of pesticide recommended by government is reliable. In other word, if the effect of new technology can be assured, and there was no significant fluctuation, 33% of farmer households would like to use new technology, even though no subsidy would be provided. This situation is similar to fertilizer.

The proportions of interviewees who chose subsidy level of 10%, 20% and 30% were 2.60%, 10.78%, and 12.27%, respectively. The reason for their selection lies in the fact that the subsidy could save their cost. The percentages of those who chose subsidy level of 40%, 50%, and 60% were 8.55%, 21.19%, and 4.83%, respectively. The main reasons for their selections are as follows:
covering the difference in cost; reducing the risk with higher subsidy. For those who chose the subsidy level of 70% and did not want to accept subsidy, the proportions were 2.23% and 4.46%, respectively. The reasons for their choice are that they worry about the effect of killing pest, since there were various kinds of pest; or they felt satisfied with the current situation and did not want to take any risk. Moreover, most interviewees who had taken part in the unified prevention and control did not want to accept the new pesticide.

**Statistical diagram of proportions about the selection level on pesticide and new technology by farmer households plant rice （不接受：No acception）**

As for those interviewees who planted Chinese yam and Pueraria thomsonii, the average subsidy ratio for the use of compound fertilizer and high efficiency and low toxicity was 8%. In addition, there were 76% and 40% of interviewees can accept no subsidy for the use of fertilizer and pesticide, if the new technology can reduce their cost and has a remarkable effect in increasing yield.

1. 作物类型: 淮山粉葛 Type of crops: Chinese yam and Pueraria thomsonii
**Recommend technology:** formula fertilizer and high efficiency and low toxicity pesticide

**Average wanted subsidy level:**

- **Formula fertilizer:** formula fertilizer
- **Pesticide:** pesticide

**Reduce cost:**

- **Be doubtful about the effect:**

**Subsidy to cover the cost gap and risk guarantee:**

- **The formula fertilizer could be replaced by farm manure:**

- **The effect is not very good:**

With regard to the ways of subsidy, most interviewees accept the way of IC card, which was designed by this project. The main reasons for those who did not want to accept subsidy are as follows:

- The inconvenience caused by a long distance away from agricultural materials shop, which means a higher travelling expense.

- Lack of transparency during the implementation process of subsidy

- Difficulties in the recycling of package waste

![Pie Chart](image)

**Statistical diagram of interviewees’ willingness to accept subsidy**

- **Willing:** Yes; 97.34%
- **Not willing:** No; 2.66%

**Brief summary:**

- Under the following two preconditions, farmer households were willing to apply new technology, even though there is no subsidy.

  1. Make sure the use of fertilizer and pesticide will not result in crop failure and affect the quality of crops.

  2. Make sure there will no sharp increase of cost.

- Most farmer households would not to use new fertilizer and pesticide until they could see
the actual effect. Therefore, they hoped some experimental field could be established at first, or some free samples of fertilizer and pesticide could be distributed to them.

- Make sure the technical guidance and process supervision of experts are in place. Otherwise, some peasants may misuse fertilizer and pesticide according to weather conditions and their own experiences.

- Make sure the transparency of implementation process of subsidy, the location of agricultural materials shop should be for people’s convenience.

4 Conclusion

- The farmers’ fertilization practice was mainly affected by experience, surrounding farmers, agricultural material shop. Without any demonstration effect of good examples, it may be difficult for them to change their habits of fertilization and using pesticide.

- Under the precondition that there will be no sharp rise of the cost, farmers care more about the effect of new technology than the level of subsidy. As a result, it could be taken into consideration to lower the standard of subsidy, and use the savings to set up an insurance fund for the reduction output.

- Do a number of field tests before the implementation a new technology, so as to ensure its effect and stability. Moreover, an early warning and emergency plan should also be made.

- Refine the operation guidance and responsibilities of agricultural specialists, agrotechnical station and grassroots village committee on the supervision during the productive processes.

- Make sure the implementation process of subsidy policy to be open and transparent. The site selection of agricultural materials shop should be reasonable and for people’s convenience.
Annex VII. Community Implementation Manual

1. Abstract

1.1 Purpose of Community Implementation Manual

The implementation of the project is realized by the exiting community organization and activities. With the help of village cadres, agricultural station, technical instructors, supervisors, professional cooperatives and corporate organization, farmers and related companies can participate in the project. Through means of advertisement, training, subsidy and supervise, participants can become familiar with the knowledge of nonpoint source pollution control and thus become more willing to participate.

Purpose of the manual:

1) Provide a concise guidance to the community (village) staff organization to carry out the project preparation, implementation, evaluation and monitoring activities to improve the project operability

2) With the help of existing communities (villages) organization and human resource, farmers (especially women) and enterprises can be encouraged to participate in various types of activities in the agricultural non-point source pollution control project, such as publicity, training, supervision, in order to maximize farmers self-organization and self-manage ability and to ensure the participation and effectiveness.

1.2 Target participant for the manual

This manual applies to the community (village) level project participants including publicity staff, implementation staff and supervision staff. The participants include technical instructors, supervisors, cooperatives, professional plantation companies, anti-integration company and farmers at the community level.
2. Community Implementation Framework

2.1 Community main participants

2.1.1 Organization and management body

(1) Provincial Project Office and pesticide and fertilizer recommendation committee

Provincial project office established a pesticide and fertilizer recommendation committee. The committee has one director and 4 members, which are professionals in agricultural administration, agriculture extension, research institutes or pesticide management department. The duties of the committee are:

- Post bidding information for projects related to subsidy on pesticides and fertilizers.
- Monitor the enterprises that involve in the bidding, organize experts to assess the bidding.
- Determine a list for subsidy related items, including the varieties, price and supply enterprise of pesticides and fertilizers.
- Coordinate the operation, promotion and supervision for pesticides and fertilizers use.

(2) Project office of city and county

- Hold bidding for pesticide and fertilizer subsidy enterprise and determine the successful enterprise.
- Sign contract with the successful enterprise
- Purchase and distribute part of the agriculture equipments
- Supervise the successful enterprise

(2) Project office and agriculture office of town

- Publish information about the project
- Guide the work of village committee
- Convey the instruction from superior offices

(3) Village committee

Village committee is the most important organizer in the project, main operators from the committee includes village cadres and staff. The primary responsibility for
the committee includes:

- Publish project related information
- Register, review and summary the information of the farmers, cooperatives and enterprise who volunteered to participate in the project
- Issue the pesticide the fertilizer subsidies registration IC card, and asked farmers to sign signature
- Carry out theme promotion activity about the project
- Organize congress of the farmer representatives
- Record the project related activity of the farmers, including the use of fertilizers.
- Report the problems in the project implementation and provide solutions

2.1.2 Project implementation main body

(1) **Subsidy pesticide and fertilizer selling spot**

The subside pesticide and fertilizer selling spots are the selling stores that win the bidding, their duties are:

- Install IC card reader and software designed for the project information system
- Set up specific selling counters, post subsidy information about varieties of pesticides and fertilizers, subsidy standard and sales price. Their sale price shall not exceed the ceiling price sales
- Organize and supply different variety and quantity of pesticide and fertilizer in a timely manner according to demand in the project area,
- When the subsidy farmer or company buy the subsidy pesticide and fertilizer, the price should be the one which had subtracted the subsidy, according to the ‘crop production file’,
- Register and store of farmers IC card information (date of sale, pesticides and fertilizers quantity, etc.)
- Recycle the packaging waste from used items
- Keep record of sale

(2) **Agricultural device store**
Agriculture device stores are the qualified stores that sell devices such as sprayer, their duties are:

- Post information about subsidy, such as the list of agricultural equipment, name, subsidy standards and sales price. Their sale price shall not exceed the ceiling price sales
- Sell agricultural devices on the price subtracted the subsidy to farmers or companies
- Register and store IC card information of farmers (date of sale, pesticides and fertilizers quantity, etc.)
- Report the sale record to related agricultural device company, the agricultural device company then settle accounts with provincial project office according to the record.

(3) **Equipment supply company**

Equipment supply companies are those who won the bidding held by provincial project office. Every year, city or county project office will organize unified purchase according to recorded the implemental area and crop type. The duties of equipment supply companies include:

- Organize installation of device
- Hold the responsibility of maintenance and supply of spare parts
- Ask the provincial project office for reimbursement and settle bills according to the purchase list and the bidding price

2.1.3 **Technical support body**

(1) **Grass root experts**

- Regularly inspect and guidance for the project implementation and data collection
- Project implementation progress record
- Summary report on the implementation of each subproject

(2) **The agricultural station / District Technical Instructor**

- Responsible for regular technical guidance of the project
- Publish information on agricultural information such as weather, pests and diseases
- Technical promotion and training activity

2.1.4 Supervision and evaluation body

Supervisor

1-2 supervisors every village, their duties are:
- Field inspections during busy farming periods, supervision on farmers’ use of fertilization and equipment
- Supervise and guide the correct operation to the farmers
- Record and summarize information with the information platform, and feedback timely.

2.2 Community implementation steps

The community involvement in this project includes three parts: preparation, implementation and evaluation.

Community preparations: Community preparedness is a process of community capacity building, information disclosure, propaganda and mobilization, personnel recruitment and organization of training to improve the awareness of the participants on the project, to prepare human resource and organizations.

Implementation: Implementation is divided into four parts, including fertilizer reduction and pests control, the pesticide reduction and pests control, conservation tillage and livestock waste management project.

Evaluation: This project would evaluate the achievement of participants, and provide reward or punishment. This incentive evaluation would be conducted twice a year by the project office of city or county, with the help of village committee, information record and the supervisor. For participants with excellent performance, goods or cash would be awarded; those who behave illegally would be deprived of their right to participate in the evaluation for reward. In addition, in order to encourage the village committee and related staff to participate the project, every month a proposed subsidy of 1000 yuan would be given to each unit. In the next 5 years, more incentive subsidy would be given according to the previous evaluation.
record which is held twice a year.

3. Preparation work

3.1 Information disclosure

The information disclosure is done by project office and implementation organization including street committee and village committee. It serves to help target farmers and companies to get familiar with related advertisement, training, subsidy and participation information.

The open channels includes: media publicity, website publicity, community publicity, to disseminate information manual, convene the meeting of villagers and business representatives.

The information for disclosure includes:

- Registration and participation method
- Project operation method and procedure
- Manufacturers and operators bidding information
- Information about technical instructors and supervisors
- Publicity and training information: training programs (including training time, place, content); advertising materials and location
- Complaints and suggestions channels

3.2 Propaganda

The implementation of propaganda is an important way to ensure the implementation of new technology. The main forms of propaganda are:

Brochures: including project background, knowledge of the project organization structure, and responsibility, knowledge on non-point source pollution control, subsidies, fertilization medication technical, and maintenance of farm equipment.

The villagers representative meeting: organize meetings for qualified and volunteer villagers, to answer questions and to improve the participants' enthusiasm and awareness.
3.3 Voluntary registration

For the five main participation bodies of farmer, grower, professional cooperatives, professional planting companies and unified control companies, the principle of participation is voluntary registration. Participants can register for participation in village committee if they meet the following criteria,

1) Growers on rice, corn, potatoes, vegetables, citrus, litchi, longan with planting area of 1-50 acres in project area.

2) Professional cooperatives, professional plantation companies (farms), grower (over 50 acres) in the project area

3) Unified control companies in the project area

3.4 Training

In order to ensure the consistency and completeness of the implementation of the project, the City / District Project Office, street committee or village committee, and the Expert Group should organize the project training for grassroots. The overall goal is through regular and systematic training, grassroots and staff can be familiar with the content of the work and procedures, and carry out the non-point source pollution control project effectively. The whole training would be divided into separate trainings for different groups and different areas in the project. All levels of training arrangements are as follows:
<p>| Training for project implementers | Technical promoters in cities and counties | Improve techniques in using pesticide and fertilizer to reduce agricultural non-point pollution | 1. Principles of scientific fertilization, typical crop scientific fertilization technical regulations; 2. latest concept of integrated pest management (IPM), a pest management plan of the project, the corresponding crop pest pollution control technology, the safe use of pesticides and pesticide management on sales according to related policies and regulations; 3. conservation tillage | Lecture | To be determined | Provincial Soil and Fertilizer Station, Plant Protection Station, and external experts | Twice a year from 2014-2018 | Plans |</p>
<table>
<thead>
<tr>
<th>Target</th>
<th>Goal</th>
<th>Content</th>
<th>Method</th>
<th>Location</th>
<th>Faculty</th>
<th>Time</th>
<th>Remark</th>
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</thead>
<tbody>
<tr>
<td>2</td>
<td>Farmers in project area</td>
<td>Master fertilizing techniques for different crops</td>
<td>The technical regulations for different crop fertilization and spraying</td>
<td>Lecture and practice</td>
<td>To be determined by town</td>
<td>Provincial Soil and Fertilizer Station, Plant Protection Station, and external experts</td>
<td>5 times a year from 2014-2018 (for different crops)</td>
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<td>3</td>
<td>Breeders in project area</td>
<td>Master farm waste processing technology</td>
<td>Waste treatment according to the type of waste</td>
<td>Lecture</td>
<td>To be determined by province</td>
<td>External experts</td>
<td>2 times a year from 2014-2018</td>
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<td>4</td>
<td>Managers in breeding industry</td>
<td>Master efficient and healthy pig growing techniques and low emissions</td>
<td>1. Efficient and healthy pig growing techniques; 2. low emissions fodder technology</td>
<td>Lecture</td>
<td>To be determined by province</td>
<td>External experts</td>
<td>2 times a year from 2014-2018</td>
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<td>Target</td>
<td>Goal</td>
<td>Content</td>
<td>Method</td>
<td>Location</td>
<td>Faculty</td>
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<tr>
<td>5</td>
<td>Agricultural technical promoters (growing industry)</td>
<td>Study integrated water and fertilizer application technology in foreign country</td>
<td>Water management, irrigation technique, irrigation and fertilizing equipment and drip irrigation application, crop monitoring in Israel</td>
<td>Lecture</td>
<td>Israel</td>
<td>External experts</td>
<td>2014</td>
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<td>6</td>
<td>Agricultural technical promoters (breeding industry)</td>
<td>Healthy pig breeding technology</td>
<td>1. Construction of farm facilities; 2. Pig breeding mode; Waste treatment management</td>
<td>Lecture</td>
<td>US, Canada</td>
<td>External experts</td>
<td>2015</td>
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<td>7</td>
<td>Agricultural technical promoters (growing industry)</td>
<td>Application technique for new fertilizer and pesticide management training</td>
<td>1. Efficient use of water and fertilizer, integrated management mode of water and fertilizer, technology on formula fertilizer, management of soil nutrients, monitoring the environmental impact of fertilizer, management technique on organic soil and fertilizer. 2. Management</td>
<td>Lecture</td>
<td>EU</td>
<td>External experts</td>
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<td></td>
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<tr>
<td>1</td>
<td>Project manager training</td>
<td>Improve management ability</td>
<td>Bank projects bidding, file management, financial management, reimbursement, monitoring and evaluation</td>
<td>Lecture and practice</td>
<td>To be determined</td>
<td>External experts related to world bank project</td>
<td>5 times a year from Jan. 2014–Dec. 2017, 5 days and 60 people per training, 25 trainings for 1500 people in total</td>
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<tr>
<td>2</td>
<td>Municipalities management personnel training</td>
<td>Improve farm waste management</td>
<td>Management training of farm pollution control</td>
<td>Lecture</td>
<td>To be determined</td>
<td>External experts</td>
<td>2 times a year from 2014–2018, 3 days and 50 people per training, 10 training for 500 people in total</td>
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<td>3</td>
<td>Town and village cadres of the project area</td>
<td>Implementation of the project</td>
<td>Familiar with the project implementation manual</td>
<td>Lecture</td>
<td>To be determined</td>
<td>Project offices</td>
<td>Jan. 2014 to Jun. 2017, 2 days and 30 people per training, 2 training for every town in</td>
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<tr>
<td>Target</td>
<td>Goal</td>
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<td>Other stakeholders training</td>
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<td>their first project year</td>
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<td>1</td>
<td>Primary school teachers in project area</td>
<td>The green school teacher training</td>
<td>1. Guide on choosing textbook; 2. Guide on course setting</td>
<td>Lecture and practice</td>
<td>To be determined by province</td>
<td>External experts</td>
<td>From 2014-2018, one training in summer vacation, one training in winter vacation</td>
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<td>Primary school students in project area</td>
<td>To enhance agriculture environmental awareness of students</td>
<td>1. Understand environment; 2. Environmental protection knowledge; 3. Survey on local environment;</td>
<td>Lecture and practice</td>
<td>Green primary school (one pilot unit for every project town)</td>
<td>External experts</td>
<td>2014-2018</td>
</tr>
</tbody>
</table>
4. Community Implementation

4.1 Fertilizer Reduction Project

4.1.1 Formulated, Slow-release Fertilizer Techniques for Rice

(1) Making and distributing IC card

By bidding, select a IT company to make IC cards and corresponding software. User data are gathered and recorded into the database for the project. Individual farmers will get their cards at the village committee. The cooperatives and enterprises receive theirs from the county.

(2) Purchase & Compensation
Fig 4-1: Flow chart of formulated / slow-release fertilizer / Rice Controlled Fertilizing technique’s compensation plan

The material store should be equipped with internet access, and applied through the county office. Stores compete to have authorization. Authorized stores sign the agreement and set up IC card readers and software.

After farmers receive the technology brochure, they purchase their materials using the IC card from the authorized store. They receive the discount by using the IC Card and signing the farmer records. The discount is in proportion to the area of farmland. Supervision is done by the city PMO and county’s department of agriculture.

The farmers keep record of the growth of the plant and perform fertilizing according to the techniques in the brochure. They can turn to tech support experts via phone in their local area.

The store can use the IC Card system’s data and farmers record to settle the account with the factory every 6 month.

(3) Withdrawing

The farmer is required to file application if he wants to withdraw during the project. He shall explain the reason and submit to the village committee. After being approved he shall return the IC card and record.

4.1.2 Irrigation-fertilizing Integration Technique (IFIT)

IFIT can be done in different ways, for example dripping or ejecting. For dripping, the investment rate is flattened at 700 Yuan each Mu, the compensation rate being 50%. If using ejecting, the rate will be lower than dripping.
Fig 4-2: Flow chart of IFIT compensation plan

(1) Provincial PMO announces the application of the project. The farming enterprises in the area apply through the City PMO. The City PMO will review the application and submit to the Provincial PMO for final review. After approval a contract of compensation is signed.

(2) The enterprises select and purchase the IFIT equipment at their own choice.

(3) At completion the City PMO review the condition and write the completion report.

(4) The enterprises receive compensation by settling the account using receipts and reviewing materials.

4.2 Pesticide Reduction Project

4.2.1 Solar insecticidal lamp (SIL)
Fig 4-3 Flowchart of SIL purchase and implementation

(1) At the beginning of the project, the Provincial PMO authorizes the winner of the bidding as the authorized SIL supplier. Every year, city PMOs purchase the lamps in unity according to new plants and area. The city PMO and Agricultural Technology Office are responsible to distribute and maintain the SIL. The supplier will set up the system and provide maintenance service. Finally, the supplier settled the account with Provincial PMO every year with the purchase record. 40% of reimbursement is given after setting up. Additional 10% will be reimbursed if the lamp is still operating after 5 years.

(2) For the unified control area, the unified control company is in charge of the maintenance, while the cooperatives, markets, and large owners are responsible for their own maintenance.

(3) The city PMO and Agricultural Technology Office advertises the advantages to using SIL and supervise the application of it. The city PMO apply for maintenance fee from Provincial PMO with operation and maintenance record. The compensation will be given to the subject of performing the maintenance eventually.
4.2.2 Biological Pesticide (BP) and High Efficiency Low Toxicity Pesticide (HELTP)

Fig 4-4 Flowchart of compensation plan of BP & HELTP

1. Provincial PMO selects and recommend the BP and HELTP lists and distributes IC card according the area and farmer population.

2. Every year before implementation of project, the city PMO and county department of agriculture track the population of farmers and farm area, and submit the data into IC Card system. Then Provincial PMO determines the compensation amount for each farmer and stores virtual cash on IC Card. The farmers go to the supplier store to buy listed BP & HELTP using virtual cash on the card, and at the same time return the waste for recycle. The city PMO and county department is in charge of tech support and supervision.

3. At the end of every season, the store reports the farmers’ purchase records to corresponding dealer which settle the account with Provincial PMO. Then the dealers settle their own account with each store.
4.2.3 Disinfestation Equipment

Fig 4-5 Flowchart of compensation plan for Sprayer

1) Provincial PMO will evaluate the result of sprayer selection, and have the recommendation committee determine the final list of companies and brands for agricultural device.

2) Before the project implementation every year, the city project office and town agriculture office will make statistics on the number of growers (small scale grower, big scale grower, cooperatives and farms) and planting area (the selected Agriculture Device Store will keep a copy) and will report to Provincial Project Office’s IC card system. Provincial Project Office will give subsidy by IC card according to the statistics on sprayer number and type for each grower. When the growers purchase the agriculture device in the store, they can pay with the IC card instead of cash. Meanwhile, the used device can be recycled by the agriculture device store. The city project office and town agriculture office will monitor the process of using IC card, supervise and guide the use of agriculture device.

3) After the cultivation of each kind of crop, the Agriculture Device Store can report the sale statistics to related agriculture device company, the device company will settle the bill with Provincial Project Office according to the sale record.
4.2.4 Purchase of Sticky Card for Insect

Fig 4-6 Flowchart of compensation plan for Sticky Card for Insect

(1) Provincial Project Office select the sticky card supply company through recommendation committee.

(2) Every year before the implementation of the project, the city project office and town agriculture office will make statistics on the number of vegetable grower, number of vegetable trading area and planting area, and report to Provincial Project Office’s IC card system.

(3) City and county project office will purchase the sticky card according to the list of sticky card and supply company, and distribute to the big scale grower and farms. City and county project office and town agriculture office will monitor and provide technical support to the big scale grower and farms.

(4) City and county project office will settle the bill directly with Provincial Project Office.
4.2.5 Unified control

Fig 4-7: Flowchart of compensation plan for Unified Control

(1) Provincial and City Project Office select the Unified Control Company

(2) Before the project implementation every year, the city project office and town agriculture office will make statistics on the number of grower and planting area (the Unified Control Company will keep a copy). Provincial Project Office will give subsidy by IC card according to the statistics. When the Unified Control Company conduct the service, farmers can pay with the IC card instead of cash. The city project office and town agriculture office will monitor the process of using IC card. The Unified Control Company must use the high efficiency and low toxicity pesticide listed in the recommendation list.

(3) After the cultivation of each kind of crop, the Unified Control Company can settle the bill with Provincial Project Office according to the service record.

4.3 Conservation tillage project

According to research and related information, there are few cases on conservation tillage in Guangdong province. But based on the project experience of World Bank in other countries and other provinces, the mode has significant positive impact for the arable soil surface protection, reduce the loss of fertilizer, reduce pesticide application and improve soil organic matter. It can reduce manual input and improve the quality of agricultural products. So some small-scale pilot projects would
be carried out in some towns in Jiangmen and Huizhou to determine the specific mode and implementation method in Guangdong Province.

(1) Project organize mechanism:

- The purchased device is owned by the state and used in pilot project areas. If desired effect is accomplished in three years, the device would be given to the project unit.
- The main bodies of the pilot project are big leading companies and professional cooperatives in the project area
- The conservation tillage will be carried out under the guidance of experts in technology promotion.

(2) The mechanism of the implementation of the project

Signed an agreement with the farmers, equipment and equipment operating costs would be provided by the project. The farmers will operate the equipment under the guidance of experts on how and when to use the device. The farmers will by the fertilizer and pesticide by themselves and use under the guidance of experts.

4.4 Livestock waste management project
5. Complaints and suggestions channels

In the project implementation process, the participants may encounter unforeseen problems and have related recommendations, village or neighborhood committees, district and county project office should set up a dedicated staff and departments to accept, process and give feedback to such complaints and suggestions from the farmer or enterprises, and report.

<table>
<thead>
<tr>
<th>District</th>
<th>Department</th>
<th>Contact person</th>
<th>Phone Number</th>
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Fig 4-8: Flowchart of compensation plan on livestock waste management
6. Monitor and evaluation

In order to ensure the smooth implementation of non-point source pollution control, the project has established a monitoring and evaluation mechanism, including the assessment of internal supervision and external detection.

The internal supervision is that the City Project Office will conduct regular inspection to town and village committee, the community should provide registration form, and the City Project Office will report to World Bank for investigation. The external monitoring is conducted by hiring an independent third organization. This third organization will make objective and periodic assessment of the process and effect of the project, and make recommendation on related issues. Generally speaking, a social impact report should be submitted twice a year. And the main monitoring indicators include:

- **Women's participation**: The indicators include the proportion of women cadres of the management units, the proportion of women among farmers, the proportion of women workers in farms and related companies.
- **Participation of disable person**: This indicator includes the proportion of persons with disabilities, the proportion of persons with disabilities among the farmers, the proportion of disabled workers in farms and related companies.
- **Participation of small scale farmer**: This indicator shows the proportion of small scale farmer (with planting area less than 50 mu) among all farmers.
- **The impact of breeding farm to surrounding environment**: This indicator is used to evaluate the impact of breeding farm on the daily life and environment on surrounding areas.
- **Breeding farm land use**: This indicator is used to evaluate if the breeding farm construction project would involve in extra acquisition of land and resettlement.
- **Comments and complains during the project**: This indicator is used to evaluate the overall impact of the project.