

Document of
The World Bank

Report No: {ReportNo}

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US\$ 100.0 MILLION

AND A PROPOSED GRANT FROM THE

GLOBAL ENVIRONMENT FACILITY TRUST FUND

IN THE AMOUNT OF US\$5.1 MILLION

TO THE

THE PEOPLE'S REPUBLIC OF CHINA

FOR A

GUANGDONG AGRICULTURAL POLLUTION CONTROL PROJECT

June 8, 2013

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CURRENCY EQUIVALENTS
(Exchange Rate Effective {Date})

Currency Unit	=	RMB
RMB 6.25	=	US\$1.0
US\$ 0.16	=	RMB 1.0

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

CA	Conservation Agriculture	LWMP	LWM Plan
COD	Chemical Oxygen Demand	LWMEAP	LWM in East Asia Project
CPS	Country Partnership Strategy	M&E	Monitoring and Evaluation
CQS	Selection based on Consultant's Qualifications	Mini-PIP	Mini Project Implementation Plan (for pig farms only)
DA	Designated Account	mu	Measurement Unit equal to 1/15 th of an hectare
DDG	Deputy Director General	NCB	National Competitive Bidding
DEP	Department of Environmental Protection, Guangdong Province	PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
DOA	Department of Agriculture, Guangdong Province	PIM	Project Implementation Manual
DOF	Department of Finance, Guangdong Province	PLG	Provincial Leading Group
DRC	Development and Reform Commission, Guangdong Province	PMO	Project Management Office, Guangdong Province
ECOP	Environmental Code of Practice	PMP	Pest Management Plan
EMF	Environmental management Framework	PMU	Project Management Unit
EMP	Environmental Management Plan	PP	Procurement Plan
FM	Financial Management	PSC	Provincial Steering Committee
FMM	Financial Management Manual	QCBS	Quality and Cost Based Selection
FYP	Five Year Plan	QBS	Quality Based Selection
GEF	Global Environment Facility	RP	Resettlement Plan
GPAO	Guangdong Provincial Audit Office	RPF	Resettlement Policy Framework
ha	hectare	SA	Social Assessment
IBRD	International Bank for Reconstruction and Development	SOE	Statement of Expenses
ICB	International Competitive Bidding	SPP	Standing Pig Population
IPM	Integrated Pest Management	SSS	Single Source Selection
Kg	Kilogram	TEG	Technical Experts Group
KM	Knowledge Management	TP	Total Phosphorous
LWM	Livestock Waste Management	WA	Withdrawal Application

Regional Vice President:	Axel van Trotsenburg
Country Director:	Klaus Rohland
Sector Director:	John Roome
Sector Manager:	Mark Lundell
Task Team Leader:	Jiang Ru, Wendao Cao

COUNTRY
China: Guangdong Agricultural Pollution Control (P127775/P127815)

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PAD DATA SHEET

China

China-Guangdong Agricultural Pollution Control (P127775)

PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC

EASCS

Report No.: **PAD416**

Basic Information			
Project ID	Lending Instrument	EA Category	Team Leader
P127775/P127815	Specific Investment Loan	B - Partial Assessment	Jiang Ru/Wendao Cao
Project Implementation Start Date		Project Implementation End Date	
01-Oct-2013		30-Jun-2019	
Expected Effectiveness Date		Expected Closing Date	
01-Mar-2014		31-Dec-2019	
Joint IFC			
No			
Sector Manager	Sector Director	Country Director	Regional Vice President
Mark R. Lundell	John A. Roome	Klaus Rohland	Axel van Trotsenburg
Borrower: International Department, Ministry of Finance			
Responsible Agency: Department of Agriculture, Guangdong Province			
Contact:	Mr. Chen Zhenghui	Title:	Deputy Director General
Telephone	(86-20) 3728-8910	Email:	gdmywrzl@126.com
No.:			
Project Financing Data(US\$M)			
<input checked="" type="checkbox"/> Loan	<input checked="" type="checkbox"/> Grant	<input type="checkbox"/> Other	
<input type="checkbox"/> Credit	<input type="checkbox"/> Guarantee		
For Loans/Credits/Others			
Total Project Cost (US\$M): 213.30			
Total Bank Financing (US\$M): 100.00			
Financing Source		Amount(US\$M)	
BORROWER/RECIPIENT		108.20	
International Bank for Reconstruction and Development		100.00	
Global Environment Facility (GEF)		5.10	

Total	213.30
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Expected Disbursements (in USD Million)

Fiscal Year	2014	2015	2016	2017	2018	2019	0000	0000	0000
Annual	2.00	15.00	20.00	25.00	25.00	18.10	0.00	0.00	0.00
Cumulative	2.00	17.00	37.00	62.00	87.00	105.10	0.00	0.00	0.00

Project Development Objective(s)

The proposed development objective is to reduce water pollutant releases from crop and livestock production in selected areas of Guangdong Province.

Components

Component Name	Cost (USD Millions)
Environmentally Friendly Crop Production	47.60
Livestock Waste Management	140.10
Monitoring and Evaluation, Capacity Building and Knowledge Management	16.70
Project Management	8.65

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes []	No [X]
Does the project require any waivers of Bank policies?	Yes []	No [X]
Have these been approved by Bank management?	Yes []	No [X]
Is approval for any policy waiver sought from the Board?	Yes []	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No []

Safeguard Policies Triggered by the Project

	Yes	No
Environmental Assessment OP/BP 4.01	X	
Natural Habitats OP/BP 4.04		X
Forests OP/BP 4.36		X
Pest Management OP 4.09	X	
Physical Cultural Resources OP/BP 4.11		X
Indigenous Peoples OP/BP 4.10		X
Involuntary Resettlement OP/BP 4.12	X	
Safety of Dams OP/BP 4.37		X
Projects on International Waterways OP/BP 7.50		X
Projects in Disputed Areas OP/BP 7.60		X

Legal Covenants			
Name <i>Institutional Arrangements</i>	Recurrent	Due Date	Frequency
Section I (A) of Schedule of Project Agreement	Y		Ongoing
Description of Covenant			
Guangdong maintains a Provincial Steering Committee, a Project Leading Group, a PMO at the provincial level and similar institutional arrangements at the two project municipalities and six project counties.			
Legal Covenants			
Name <i>Project Implementation Manual</i>	Recurrent	Due Date	Frequency
Section I (B) 1 of Schedule of Project Agreement	Y		Ongoing
Description of Covenant			
Guangdong carries out project activities by following the agreed procedures and arrangements documented in the Project Implementation Manual. Amendments to the Project Implementation Manual require prior written agreement of the Bank.			
Legal Covenants			
Name <i>Safeguards</i>	Recurrent	Due Date	Frequency
Section I (D) of Schedule of Project Agreement	Y		Ongoing
Description of Covenant			
Guangdong carries out project activities in accordance with the provisions of the Environmental Management Plan, the Pest Management Plan and the Resettlement Policy Framework. Amendments to any of these documents require prior written agreement of the Bank.			
Conditions			
Name <i>IC Card System</i>			Type
Section IV (B)1(b) of Schedule II of Loan Agreement			Disbursement
Description of Condition			
Guangdong establishes a functioning IC card system (including both software and hardware) prior to disbursement of any IC card payments to suppliers or service providers.			
Team Composition			
Bank Staff			
Name	Title	Specialization	Unit
Bernardita Ledesma	Operations Analyst	Operations Analyst	EASER
Tijen Arin	Senior Environmental Economist	Senior Environmental Economist	EASER
Songling Yao	Senior Social Development Specialist	Senior Social Development Specialist	EASCS
Junxue Chu	Senior Finance Officer	Senior Finance Officer	CTRLN
Xiaowei Guo	Senior Procurement Specialist	Senior Procurement Specialist	EASR2

Jiang Ru	Senior Environmental Specialist	Team Lead	EASER
Yi Dong	Sr Financial Management Specialist	Sr Financial Management Specialist	EASFM
Wendao Cao	Sr. Rural Development Specialist	Co-Team Lead	EASCS
Yiren Feng	Senior Environmental Specialist	Senior Environmental Specialist	EASCS
Zijing Niu	Program Assistant	Program Assistant	EACCF

Non Bank Staff

Name	Title	Office Phone	City
Kurt Roos	Livestock Waste Management Specialist	1-202-343-9041	Washington, USA
Josef Kienzle	Agricultural Engineer	39-065705-2612	Rome, Italy

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
China	Guangdong Province	Jiangmen	X		
China	Guangdong Province	Huizhou	X		

Institutional Data

Sector Board

Agriculture and Rural Development

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Agriculture, fishing, and forestry	Animal production	69		80
Agriculture, fishing, and forestry	Agricultural extension and research	11		
Agriculture, fishing, and forestry	Crops	20		
Total		100		

I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Themes

Theme (Maximum 5 and total % must equal 100)

Major theme	Theme	%
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Environment and natural resources management	Pollution management and environmental health	70
Environment and natural resources management	Climate change	30
Total		100

I. STRATEGIC CONTEXT

A. Country Context

1. China made significant progress in curbing the rapid growth of pollution discharges during its 11th Five Year Plan (FYP) period (2006-2010) but still faces tremendous challenges to improve the overall quality of the country's environmental standing. China's 12th FYP (2011-2015) states that environmental degradation will continue and threaten public health due to population growth, rapid industrialization and urbanization, as well as increasing energy consumption. In line with these trends, China also officially acknowledged in 2010 that agriculture and rural settlements had surpassed industry and urban areas as the most important sources of water pollution. According to the First National Pollution Source Survey Report,¹ agricultural sources including, crop and livestock production and aquaculture, but excluding rural household sources, contributed 44%, 57% and 67% of China's total chemical oxygen demand (COD), total nitrogen (TN) and total phosphorus (TP) discharges in 2007, respectively.²

2. In recognition of the magnitude of these challenges, the 12th Environmental FYP proposes detailed strategies to address agricultural pollution. It calls specifically for controlling pollution from crop production by promoting soil nutrient management, ecological and organic agriculture, and the use of biological, high efficiency, low toxicity and low residue pesticides. It also lists national reduction targets for two key water pollutants – COD and ammonia – related to agricultural pollution sources. These targets ultimately will be allocated to each level of local governments as part of their performance targets.

B. Sectoral and Institutional Context

3. Guangdong is one the most developed and urbanized provinces of China. Nonetheless, agriculture remains the major economic sector in the province's northern and western regions. In 2009, its total agricultural output reached 201.03 billion Chinese yuan (approximately US \$31 billion). Key crops produced include rice, vegetables, potatoes and maize. In the same year, its total meat production amounted to 4.3 million tons. This high level of agricultural output has led to serious pollution issues. As shown in Table 1, the First Guangdong Pollution Source Survey Bulletin reported that in 2007 agricultural sources contributed 40.4%, 41.5% and 56.0% of Guangdong's gross COD, TN, and TP discharges, respectively.³ From amongst the three agricultural sources (crop, livestock and aquaculture), the Bulletin further estimated that livestock production alone contributed 89%, 50.1% and 55.0% of COD, TN and TP releases, respectively (Table 2). When assessed together with the contributions made by crop production, these two sources of pollution accounted for 89%, 91.6% and 87.3% of COD, TN and TP releases from Guangdong's agricultural sector.

¹ Issued by the Ministry of Environmental Protection, National Bureau of Statistics and Ministry of Agriculture in 2010.

² Among agricultural sources, crop production accounted for 59% and 38% TN and TP releases and livestock production accounted for 38% and 56% of TN and TP discharges, respectively. Livestock production also accounted for 96% of COD. The releases of nitrogen and phosphorus are linked to excessive and/or inappropriate crop fertilization and discharge of untreated livestock wastes.

³ Guangdong Department of Environmental Protection, Bureaus of Statistics, Department of Agriculture, and Bureau of Ocean and Fishery on June 4, 2010.

Table 1: Water Pollutant Releases in 2007: Guangdong (Unit: metric tons)

Pollution Sources	COD	TN	TP
(a) Industrial	247,300	--	--
(b) Agricultural	1,036,800	160,200	22,900
(c) Domestic	1,280,300	225,600	18,000
Total	2,564,400	385,800	40,900
(b)/(a+b+c)	40.4%	41.5%	56.0%

Table 2: Agricultural Water Pollutant Releases in 2007: Guangdong (Unit: metric tons)

Agricultural Sources	COD	TN	TP
(i) Crop production	--	66,400	7,400
(ii) Livestock Production	922,200	80,200	12,600
(iii) Aquaculture	114,500	13,500	2,900
Total	1,036,700	160,100	22,900
(i+ii)/(i+ii+iii)	89.0%	91.6%	87.3%
(ii)/ (i+ii+iii)	89.0%	50.1%	55.0%

4. Guangdong has identified over-use of fertilizers and pesticides, and lack of treatment of livestock waste discharges from concentrated livestock production as two major causes of its agricultural pollution. In 2007 the province consumed 2.77 million tons of nitrogen and phosphorus fertilizers and 31,000 tons of pesticides, or on average 771 kilogram (kg) fertilizers and 9.9 kg pesticides per hectare. The levels are much higher than China's national averages, as well as those in developed countries.⁴ Excessive use and low soil organic matters leads to loss of applied fertilizers and pesticides to the environment.⁵ Guangdong estimated that in 2007, about 60-70% of applied pesticides were either released into the environment or ended up as residues on agricultural products, which was adversely affecting the province's agricultural exports. Excessive pesticide use has led to a reduction in the number and types of natural predators of pests and an increase in pesticide resistance by pests and weeds, which in turn has promulgated the cycle of increased pesticide use over the years.

5. The Guangdong Department of Agriculture (DOA) has indicated that most livestock farms in the province have yet to install appropriate wastewater treatment facilities; consequently, most of the time livestock wastes are directly discharged into the environment. Among others, DOA has confirmed that pig production is the most important source of livestock pollution discharges. It has estimated that in 2010 a standing pig population (SPP) of over 20

⁴ Available data shows that in 2007, fertilizer application was about 117kg/ha in the United States, 259kg/ha in the United Kingdom, 137kg/ha in Thailand and 350kg/ha in Japan (<http://data.worldbank.org/indicator/AG.CON.FERT.ZS>).

⁵ International experience shows that low utilization rates of fertilizers and pesticides may be caused by low levels of soil organic matters. In most places of Guangdong soil organic matters are reported far below 2% - a threshold below which fertilizer efficiency declines very rapidly. Such infertile soil is usually a result of very intensive and tillage based farming practices, warm climatic conditions, and flood irrigation. All these factors accelerate organic matter decomposition in the soil.

million pigs contributed 62% of COD and 91% of ammonia-nitrogen releases from Guangdong's livestock sector.

6. DOA has also indicated that agricultural pollution has lowered the productivity of the Province's agricultural lands and negatively affected the rural environment, while simultaneously threatening the security of Guangdong's water supply and food safety. Such high levels of nutrient releases from both crop and livestock production in Guangdong are directly associated with increased levels of nutrient pollution in coastal areas of Guangdong and the South China Sea. In 2009, it was reported that the two top pollutants affecting water quality in China's coastal zones in the South China Sea were nitrogen and phosphorus, and that large amounts of land-based pollutants were entering the Sea via rivers.⁶ Increased land-based pollution has been listed as the number one threat to the structure and functional health of estuary and coastal ecosystems of the South China Sea.

7. In response to increased pollution from crop and livestock production, Guangdong has undertaken a number of initiatives to reduce fertilizer and pesticide use and improve livestock waste management (LWM). With respect to crop production, Guangdong completed an initial soil testing scheme (2011) which allowed for the establishment of a provincial soil nutrient baseline based on a scale of 200-300 mu (i.e. about 13-20 hectares). Working from this initial baseline, DOA began gradually promoting precision fertilization along with increased production and supply of organic fertilizers. In terms of pest control, DOA has promoted integrated pest management (IPM) approaches and more recently, use of professional pest management services. For LWM, from 2006 to 2011 Guangdong implemented a Bank-managed Livestock Waste Management in East Asia Project (LWMEAP) with a \$2.0 million grant from the Global Environment Facility (GEF). This project promoted sound LWM practices and piloted a number of LWM technologies and modalities in two of the province's counties. In total, the LWMEAP provided investments that assisted 23 pig farms to construct LWM facilities.⁷ In tandem with the implementation of the LWMEAP, DOA worked in concert with the Department of Environmental Protection (DEP) to develop an action plan under the 12th FYP on Environmental Protection to reduce Guangdong's agricultural pollution with a goal of regulating and reducing pollution from its large-scale commercial pig production.

8. The wide adoption of such technologies and practices nevertheless, faces challenges. Barriers identified include: (a) input-oriented subsidies may provide perverse incentives for farmers to use more agricultural inputs in their crop production than necessary;⁸ (b) cash constrained farmers are reluctant to invest in costly agricultural equipment and waste management facilities require long repayment periods; (c) results of these technologies and practices have yet to be recognized by farmers due to limited on-the-ground demonstration; and (d) farmers need extensive coaching and technical support to fully master technical details of piloted technologies and practices. Further, improving the environmental performance in pig

⁶ South China Sea Bureau of the State Ocean Administration, 2010. South China Sea Marine Environmental Quality Bulletin. The Bulletin estimated that in 2009 the Pearl River alone transported about 715,000 tons of COD and 53,770 tons of nutrients to the South China Sea.

⁷ DOA confirmed at appraisal that all LWM facilities were fully functional two years after the closing of LWMEAP.

⁸ A number of central level subsidy schemes exist in China to (a) lower farmers' costs for foodgrain production with a national Comprehensive Subsidy on Agricultural Inputs (including fertilizers, pesticides, plastic films and diesel) around 74 RMB yuan per mu per production season; (b) national policy incentives to low prices of chemical fertilizers (such as preferential prices for electricity and natural gas for fertilizer production, preferential transportation prices for fertilizers); (c) a national value added tax (13%) exemption for the use of organic fertilizers.

production also faces challenges. Pork is China's most important staple meat, with a high weight (about 3.3%) on China's Consumer Price Index. The country's pig production industry (including Guangdong) is dominated by small producers and the industry fluctuates greatly according to pork price cycles (every 3-4 years).⁹ To counter the effects of such cycles, the government introduced various incentives to promote private investments in concentrated commercial pig production.¹⁰ Such an effort often weakens the government's effort to regulate the environmental performance of pig farms to meet the sector's existing discharge standards.¹¹

9. Recognizing the challenges that may prevent Guangdong from achieving its pollution reduction target under the 12th FYP on Environmental Protection, and building on the successful results of the aforementioned initiatives, Guangdong requested the assistance of the World Bank and the GEF to prepare and implement a project to scale up previously demonstrated LWM technologies and practices, pilot additional new and innovative technologies and practices, develop the capacity of its key stakeholders, and embark on policy discussions aimed at the further reduction of pollution releases from its agricultural sectors.

C. Higher Level Objectives to which the Project Contributes

10. The proposed project is fully consistent with the China-World Bank Country Partnership Strategy (CPS) for FY2013-2016 (Report No. 67566-CN) and directly supports Strategic Theme 1: Supporting Greener Growth. The project will contribute towards the achievement of the following Strategic Outcomes under this Theme: (a) Outcome 1.4: Promoting Sustainable Agriculture Practices; (b) Outcome 1.6: Demonstrating Pollution Management; and (c) Outcome 1.7: Strengthening Mechanisms for Managing Climate Change. In addition, as noted above, the project responds to three key priorities espoused in both China's and Guangdong's 12th FYPs on environmental protection (2011-2015), namely: (i) reduction of major pollutants; (ii) protection of rural environment; and (iii) development of environmental infrastructure.

11. The project is an integral part of the World Bank/GEF program - Scaling Up Partnership Investments for Sustainable Development of the Large Marine Ecosystems of East Asia and their Coasts (GEF Program ID: 4635). It contributes to the program's objectives of promoting sustainable development of large marine and coastal ecosystems, improving the livelihoods of local populations by supporting environmental friendly crop production technologies/practices, and reducing land-based pollution from Guangdong's crop and livestock production sectors. In

⁹ It is estimated that Guangdong had over 5,000 pig farms with a SPP over 500 pigs and over 700 pig farms with a SPP of at least 3,000 pigs. Although pig production in Guangdong is moving gradually towards concentrated commercial operations, the sector still is dominated by over 180,000 small farms with 500 or less SPP.

¹⁰ Such incentives include such as grants for construction of new large-size pig farms, subsidies for introduction of high-quality breeds, and subsidies for reproductive sows. These incentives could be long term such as the subsidies for reproductive sows (50 yuan per head in Guangdong in the past four years) or for a certain period of time such as grants for construction of new farms often seen when pork prices skyrocketing.

¹¹ Nationally, the Discharge Standard for Livestock and Poultry Breeding" (GB18596-2001) and the Technical Standards for Preventing Pollution from Livestock and Poultry Breeding" (HJ/T 81-2001) require that livestock wastewater meet a certain concentration before it can be flushed into natural water resources. At the provincial level, the Guangdong Livestock Breeding Industry Discharge Standards (DB44/613-2009) is stricter than the national standard (GB18596-2001) in controlling pollution discharge from livestock farms.

so doing, it supports Outcome 2.3 (innovative solutions for pollution reduction) of the International Waters Focal Area Strategy for the GEF's Fifth Replenishment Period (2010-2014).

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

12. The proposed development objective is to reduce water pollutant releases from crop and livestock production in selected areas of Guangdong Province.

13. This project is part of Guangdong's efforts to achieve the agricultural pollution reduction targets called for under the national and provincial 12th FYPs on Environmental Protection. By improving the environmental performance of Guangdong's crop and livestock production sectors, this project will reduce land-based pollution to the coastal and estuary ecosystems of the South China Sea.

Project Beneficiaries

14. The direct beneficiaries of the project include farmers, farmers' cooperatives and crop and livestock production companies that adopt the project promoted crop production or LWM practices/technologies. DOA and municipal and county level agricultural bureaus will receive project support to develop their capacity in agricultural pollution control and accumulate experience on project promoted crop production and LWM technologies.

15. Indirect beneficiaries include (a) farmers and farm workers who are directly exposed to agricultural pollution in their daily activities; (b) communities directly affected by crop and/or livestock production related pollution; (c) users of drinking water supplied from water bodies affected by agricultural pollution in project areas; and (d) consumers of products grown on project farms who benefit from reduced levels of pesticide residue in the products they consume.

PDO Level Results Indicators

16. The proposed PDO level results indicators are: source reduction of two key pollutants' pollution loads achieved under the project – COD and ammonia nitrogen. These two key pollutants have been selected because they are controlled under the 12th FYPs, under which specific reduction targets and detailed monitoring and verification arrangements have been spelled out.

III. PROJECT DESCRIPTION

A. Project Components

17. **Component 1. Environmentally Friendly Crop Production.** Component 1 includes four subcomponents: (a) soil nutrient management; (b) integrated pest management (IPM); (c) conservation agriculture (CA) pilots; and (d) implementation support to project farmers.

Subcomponents (a), (b) and (d) will be implemented in 30 townships across six counties/cities/districts of two municipalities, Huizhou and Jiangmen. Specifically, subcomponent (a) will support: (i) development and dissemination of sound soil nutrient management plans through soil nutrient sampling and analysis; and (ii) provision of subsidies to promote the use of various technical measures to improve application and utilization efficiencies of fertilizers based on soil nutrient management plans including:

18. Subcomponent (b) will support: (i) upgrading pest monitoring and early warning systems; and (ii) promotion of IPM practices for key cropping systems through the provision of subsidies for professional pest management services, and for the acquisition of pesticides and related equipment for smallholders. Subcomponent (c) will support CA pilots to demonstrate the use of no-till or limited tillage technologies and practices for typical cropping systems in Guangdong.

19. Lastly, Subcomponent (d) will provide: (i) field technical support to project beneficiaries, in particular smallholders, on crop production practices promoted by the project; (ii) sub-financings to eligible Village Committees to finance a portion of the incremental operating costs associated with organizing those farms from their villages who will carry out project activities; and (iii) sub-financings to project beneficiaries to encourage them to undertake certification for Safe Agricultural Products or Green Agricultural Products.¹²

20. **Component 2. Livestock Waste Management (LWM).** This Component provides sub-financing to beneficiary farms to subsidize (a) the construction and operation of LWM facilities to promote the proper collection and treatment of pig manure; and (b) the incremental costs associated with the construction of pilot high-rise pig production facilities.

21. **Component 3. Monitoring and Evaluation (M&E), Capacity Building and Knowledge Management (KM).** Component 3 will have three subcomponents: (a) M&E; (b) Capacity Building; and (c) KM. Subcomponent (a) will support monitoring and evaluation of project activities including, monitoring of environmental and social safeguards, and measuring the impacts of various Project activities. Subcomponent (b) will finance (i) acquisition of monitoring equipment and vehicles to facilitate and enhance DOA's capacity to monitor agricultural pollution; (ii) the preparation studies that explore technical and policy options and measures to reduce, control and monitor agricultural pollution in Guangdong Province; (iii) provision of training to project stakeholders to improve their technical capacity to properly implement project activities; and (iv) project stakeholders' attendance in domestic and international learning events on agricultural pollution control. Subcomponent (c) will support knowledge management activities to summarize and disseminate lessons and experiences derived from project implementation.

¹² *Safe Agricultural Products* in China refers to raw or primary processed agricultural products whose production environment, process, and quality are certified to meet related national standards and guidelines. In Guangdong, such products are certified by DOA. *Green Agricultural Products* in China refers to certified products whose production and processing are carried out in accordance with specific standards that prohibit or limit the use of chemical fertilizers, pesticides, additives and other substances harmful to human and environmental health and regulate the entire quality control process of such products from the field to the final consumer. Such products are nationally certified by the Ministry of Agriculture.

22. **Component 4. Project Management.** This component will support activities to strengthen the institutional capacity of the PMO and the PMUs to implement the Project, including provision of Incremental Operating Costs.

B. Project Financing

Lending Instrument

23. The lending instrument for this project is Investment Project Financing. The project will be financed by an IBRD loan of US\$100 million and a GEF grant in the amount of US\$5.1 million.

Project Cost and Financing

Project Components	Project Cost*	IBRD/GEF Financing	% Financing
1. Environmentally Friendly Crop Production	\$47.60 million	\$39.80 million	83.6%
2. Component 2: Livestock Waste Management	\$140.10 million	\$57.10 million	40.8%
3. Component 3: Monitoring and Evaluation, Capacity Building and Knowledge Management	\$16.70 million	\$7.80 million	46.7%
4. Project Management	\$8.65 million	\$0.15 million	1.7%
Total Project Costs	\$213.05 million	\$104.85 million	49.2%
Front-End Fees	\$0.25 million	\$0.25 million	100%
Total Financing Required	\$213.30 million	\$105.10 million	49.3%

* Including contingencies.

24. The \$5.1 million GEF grant will finance CA pilots under Subcomponent 1(c), performance related M&E activities under Subcomponent 3(a), technical and policy studies and knowledge learning events under Subcomponent 3(b), knowledge management activities at the international level under Subcomponent 3(c) and, GEF-related project management activities under Component 4.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

25. The institutional structure for the project has been established at the provincial level and in two municipalities and six counties. At the provincial level, the following have been set up: (a) a Provincial Steering Committee (PSC), led by a Vice Governor of the Government of Guangdong with representatives from the Provincial Development and Reform Commission (DRC), Department of Finance (DOF), DEP and DOA, will oversee the preparation and implementation of the project; (b) Provincial Leading Group (PLG), headed by the DOA Director General (DG) and composed of DOA divisions related to project activities, will supervise DOA's activities and provide advice and guidance on key project implementation issues; (c) a Project Management Office (PMO), headed by a Deputy DG (DDG) of DOA, will be the main implementing agency with the overall responsibility for project implementation; and (d) a Technical Experts Group (TEG) will be staffed with technical experts drawn from different

areas of specialization, who will review and evaluate technical documents, and design solutions to technical issues that may arise. The institutional set-up at the municipal and county levels in Huizhou and Jiangmen Municipalities mirrors the structure at the provincial level, with a Steering Committee chaired by the deputy head of the respective local governments, a leading group headed by the director of the respective agriculture bureaus, and Project Management Units (PMUs) headed by the deputy directors of the agricultural bureaus of the two project municipalities and six project counties.

26. In terms of project implementation, DOF will supervise financial management issues related to project implementation, while the PMO will be responsible for the management of day to day project operations and the direct implementation of Components 2, 3 and 4, as well as the CA pilots under Subcomponent 1(c). In addition, the PMO will work with municipal PMUs to support county PMUs to manage implementation of the remainder of Component 1 activities.

B. Results Monitoring and Evaluation

27. A well designed M&E system has been established under this project with the aim that data generated by the system will facilitate project implementation. M&E schemes on Component 2 are built on the pollution reduction monitoring and verification system established under China's 12th FYP on Environmental Protection. This will provide a solid basis for official recognition of the project's key monitoring results. M&E targets associated with Component 1 are built on domestic and international best practices, with an eye to balancing costs and accuracy. M&E data generated will provide a concrete basis upon which to evaluate results/performance of project activities, as well as the cost effectiveness of various technical options for pollution reduction. These M&E data will be also be shared with DEP for their information and, as necessary, enforcement activities. DEP can use such information to inform data from its existing surface water quality monitoring information system to better manage surface water quality issues in Guangdong.

C. Sustainability

28. The sustainability of Component 1 interventions will be largely dependent on demonstrating the cost-effectiveness of the various technical measures adopted in reducing pollution and, more importantly, in maintaining (or even increasing) productivity. It is expected that positive results can be obtained early on during project implementation, and then be scaled up with project financing in all project counties, as well as with provincial financing in other parts of Guangdong. It is also expected that non-project farmers will adopt proven technologies on their own through support provided by project extension services and/or information exchange, through promotion of project activities and results or, through direct learning from project farmers, thereby further scaling up project sponsored technical measures.

29. The sustainability of Component 2 interventions relies on continued and mounting efforts on the part of the national and provincial governments' commitment and efforts to reduce pollution from the livestock production sector. Experience gained under the GEF LWMEAP has clearly demonstrated that with increased access to proven waste management technologies and growing enforcement pressure, commercial pig farms in Guangdong could and did invest in LWM facilities, and were able to operating these facilities successfully.

30. The sustainability of Component 3 investments on M&E requires determination on the part of the national and provincial governments to control agricultural pollution and ensure close linkage between project supported M&E activities and the DOA’s mandate on agricultural pollution reduction.

V. KEY RISKS AND MITIGATION MEASURES

A. Risk Ratings Summary Table

	Rating
Stakeholder Risk	M
Implementing Agency Risk	
- Capacity	M
- Governance	M
Project Risk	
- Design	S
- Social and Environmental	L
- Delivery Monitoring and Sustainability	M
Overall Implementation Risk	S

B. Overall Risk Rating Explanation

31. Key project risks are associated mainly with technical challenges in controlling pollution from crop and livestock production sectors. These include: (a) how to identify and provide appropriate levels of public support (grant subsidy) to help targeted project beneficiaries to adopt environmentally friendly crop and livestock production activities and lay the foundations for their ongoing sustainability; (b) how to ensure that project financing is appropriately allocated to various beneficiaries for achievable outputs/performance targets; (c) how to provide timely and good-quality extension services to support adoption of project promoted technical measures at project sites; and (d) how to monitor and evaluate project outputs and performance and prevent any misuse or wastes of project financing.

32. A well designed social assessment has been carried out during project preparation in order to best understand the social, technical, economic and environmental baselines of targeted project beneficiaries and their production activities. This assessment has laid a sound basis upon which project activities (including analysis of appropriate levels of project subsidies for various project activities and beneficiaries through a robust financial and economic analysis) and implementation arrangements have been designed.

33. Clearly presented technical options, selection criteria and subsidy criteria were developed through stakeholder consultation to ensure that the results of the social assessment were well

understood by all eligible project beneficiaries including, the nature of project activities, their associated technical requirements and cost implications, the expected pollution reduction potential, and the level of eligible subsidy support. Project financing and resource allocation/disbursement status, beneficiary information, and expected and achieved results/performance targets will be disclosed regularly in Guangdong to ensure transparency in project financing and sound governance practices in project management.

34. Support to existing extension service networks in project counties will be provided under Component 3 to ensure that all project beneficiaries understand and adopt project-promoted technical measures correctly, and have the capacity to quickly diagnose and address challenges that may be experienced during their actual adoption.

35. A well-designed M&E system was developed during project preparation. This system will be linked closely with the province's ongoing environmental monitoring and pollution reduction monitoring and verification systems. In addition, project M&E results are expected to be disclosed together with project financing information to ensure proper use of project resources, as well as to incentivize, in particular, environmental compliance of project financed pig farms.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analyses

36. Economic Analysis. The project's economic benefits include (i) expected increases in net returns to crop farmers; (ii) the value of energy and heat generated from biogas and the nutrient value of treated livestock wastes; (iii) reduced incidence of illness caused by pesticide residues; and (iv) improved surface water quality. Based on China's existing contingent valuation studies in other river basins in the country, it is estimated that the the project's economic benefits will significantly exceed project costs.

37. Financial Analysis. Crop budgets for conventional and project-promoted fertilization and pest management practices indicate a range of possible impacts on net revenues given the significant variation in the types and quantities of conventional substances currently in use. The price subsidies planned under the project would ensure a positive impact for all cases studied. A survey on willingness to pilot the said practice levels confirmed that, on average, small farmers required a subsidy to counteract the costs and risks associated with switching to new, unknown practices. The survey findings also suggested that that there may be room for a downward adjustment of the subsidy levels over the life of the project.

38. Review of the financial analyses of the first year sub-projects under Component 2 showed that project financing will generate internal rates of return for project farms in the range of 2.7%-17% (without project grant) and 10%-50% (with the maximum project grant of 65%).¹³ Given the difficulty livestock farms face in accessing investment credit and the high opportunity

¹³ Both IRRs and the financial sustainability indicator are sensitive to estimated revenues from biogas production, electricity generation and sales of treated wastes, as well as estimates of recurrent costs. Financial performance of project financed LWM facilities will be closely monitored during implementation.

cost of capital, grants to such farms will help Guangdong achieve its objective of improving water quality in its rivers without hampering the growth of the strategically important intensive livestock production sector. Strict requirements associated with maintenance of financial sustainability and a competitive allocation of grants will be promoted during project implementation to maximize return on project resources.

39. Fiscal Impact Analysis. The project is not expected to generate any incremental tax or other revenues to the provincial government. However, by reducing pollution releases, it may help Guangdong avoid sizeable expenditures on downstream water quality improvement and healthcare. In terms of overall fiscal commitments, Guangdong has fully integrated its counterpart funding and loan repayments into its provincial budget, which amounted to about \$89 billion in 2011.

B. Technical

40. Many of the technical options proposed under the project are currently being piloted or promoted in an ad hoc manner in Guangdong and thus, can be easily adopted and scaled up within the context of the project's comprehensive strategy. For Component 1, technical options to promote sound soil nutrient management activities for small holders have been carefully considered to balance the needs of precision fertilization, the costs associated with the development of a site specific soil nutrient management plan and the practicability of supplying site specific formula fertilizers. As no-tillage or limited tillage based CA practices have not been demonstrated successfully in the province, a pilot scheme will be introduced under Component 1 with the goal of quickly scaling up these practices once its positive results have been demonstrated early within the project's implementation timeframe.

41. The technical options that will be promoted under Component 2 including, various anaerobic digestion technologies and the two proposed treatment modalities, are well tested under the GEF LWMEAP and can be readily adopted and scaled up under this project. In addition, the technical design of the project emphasizes the linkages between Component 2 and fertilization activities under Component 1, the aim being to ensuring that all treated waste and wastewater from project financed LWM facilities is properly disposed of without generating secondary pollution.

42. The new high-rise pig production technology to be piloted under Component 2 uses a two-story structure to collect waste on the lower level from pig production in the top level of the structure. The solid and liquid wastes will be immediately separated, so that the solid waste may be composted on the lower level and liquid waste collected for treatment/disposal. This technology is currently being tested at a small trial facility in Guangdong with promising results demonstrated at the time of project appraisal. Minor design improvements, including better ventilation and bedding materials have been agreed upon in order to address compost quality issues that were identified at appraisal.

C. Financial Management

43. The DOA PMO will be responsible for managing the preparation and implementation of the project. The DOF will manage the Bank loan proceeds and oversee the Designated Account.

A financial management capacity assessment has been conducted by the Bank and actions to strengthen the project's financial management capacity have been agreed to with the relevant implementing units. The financial management assessment has concluded that with the implementation of the proposed actions, the financial management arrangements will satisfy the Bank's minimum requirements under OP/BP 10.02. Annex 3 provides additional information on financial management.

D. Procurement

44. A procurement capacity and risk assessment of the provincial PMO and the PMUs was conducted. The key procurement risks identified are: (i) Component 1 activities are dispersed in the 30 townships of the 6 counties of the two municipalities; (ii) possible delays and non-compliance caused by the lack of experience of the municipal and county PMUs with the Bank procurement procedures. The mitigation measures agreed upon are to assign staff with prior Bank procurement experience to the PMO, hire a qualified procurement agent, and ensure continuous capacity building in procurement and contract management for relevant staff in the PMO, PMUs and agencies with a role in procurement. The PMO will provide procurement oversight and will support and monitor procurement activities of the county PMUs. Further details are provided in Annex 3. The draft procurement plan for the first 18 months of project implementation was discussed at appraisal and **will be agreed prior to the negotiation.**

E. Social (including Safeguards)

45. Screening of social safeguard issues during project preparation confirmed that the project triggers OP 4.12 (Involuntary Resettlement). The project is expected to generate positive environmental and health benefits to residents of the project area by reducing water pollution loads from targeted agricultural sources. At appraisal, it was confirmed that activities for the first year's implementation involve no land issues. However, the possibility exists that physical construction activities under Component 1 (such as livestock storage sheds and fertigation equipment rooms next to crop fields) may involve small-scale land acquisition issues, or that candidate pig farms under Component 2 may have unresolved land issues even though all investment activities will be carried out within the farms.

46. A Resettlement Policy Framework (RPF) for the project was prepared, covering detailed procedures on review of land issues, preparation and approval of potential land acquisition activities, institutional and financial arrangements, and monitoring plans for resettlement implementation. The RPF, reviewed by the Bank and agreed between the Bank and Guangdong province, was disclosed locally on DOA's project website and on the Bank' InfoShop on February 22, 2013. The PMO has committed to the full ownership and responsibility for RPF implementation.

47. A social assessment (SA) was performed during project preparation to (a) investigate social economic baselines of the project areas; (b) understand the level of willingness amongst targeted beneficiaries to participate in project activities; (c) investigate gender issues and identify appropriate actions to address such issues; and (d) identify appropriate implementation arrangements for proposed project activities. The results of the SA have been fully incorporated into project design.

48. With respect to gender considerations, the SA identified that women have become the key labor force for crop production in the project areas. They are therefore, negatively affected by pest management activities. Female farmers interviewed expressed their strong support for the project and expressed the hope that the project would help them reduce crop production costs and improve their incomes. Recognizing the special interests and demands of female farmers, the project design has emphasized female participants in project supported IPM, capacity building and M&E activities. Specific indicators related to women's participation are included in the Results Framework and will be closely monitored under Component 3 of the project.

49. As the implementing agency for the GEF LWMEAP, DOA is familiar with Bank safeguard policies and requirements. The DOA PMO for the current project has been established drawing upon competent and experienced staff, as well as adequate resources. A dedicated staff member has been appointed to manage safeguard issues associated with the project. Safeguard training has also been provided to the PMO during the Bank preparation missions.

F. Environment (including Safeguards)

50. The Project is classified as a Category B project. An Environmental Management Plan (EMP) was prepared in accordance with domestic and Bank requirements. The EMP analyzes potential adverse environmental impacts of the project. These relate mainly to the construction and operation of biogas facilities and are expected to be small in scale, short-term, temporary and site specific, if properly managed. To enhance positive and long-term environmental benefits of the project, mitigation measures to the identified adverse impacts have been integrated into the project design, construction and operational plans. The public consultation process on the EMP involved disclosure of project information in project villages, communities, and on government websites prior to public consultation. The EMP has incorporated countermeasures to address the concerns raised during this process. With implementation of proposed mitigation measures, the potential adverse impacts will be either avoided, entirely eliminated or mitigated to an acceptable level.

51. OP 4.09 (Pest Management) has been triggered as Component 1 involves pest control activities. A Pest Management Plan (PMP) acceptable to the Bank has been prepared.

52. On January 15, 2013, the EMP and PMP were disclosed in the project areas, on the websites of the local government agencies, and made accessible at the PMOs. The EMP and PMP were disclosed at the World Bank Infoshop on February 22, 2013.

Annex 1: Results Framework and Monitoring

China: Guangdong Agricultural Pollution Control (P127775)

Results Framework

Project Development Objectives

PDO Statement

The proposed development objective is to reduce water pollutant releases from crop and livestock production in selected areas of Guangdong Province.

Indicator Name	Core	Unit of Measure	Baseline	Annual Target Values*					Frequency	Data Source/ Methodology	Responsibility for Data Collection
				YR1	YR2	YR3	YR4	End Target			
COD pollution load reduction achieved from project farms	<input checked="" type="checkbox"/>	Metric tons	51,000	2,600	10,000	22,000	34,000	45,000	Based on EMP	Environmental monitoring reports	PMO/DEP
Nitrogen load reduction (ammonia) achieved from project farms	<input checked="" type="checkbox"/>	Metric tons	9,600	300	1,000	2,500	3,500	5,000	Based on EMP	Environmental monitoring reports	PMO/DEP

Intermediate Results Indicators

Indicator Name	Core	Unit of Measure	Baseline	Annual Target Values					Frequency	Data Source/ Methodology	Responsibility for Data Collection
				YR1	YR2	YR3	YR4	End Target			
BOD load reduction achieved from project farms	<input checked="" type="checkbox"/>	Metric tons	17,800	900	3,000	7,000	10,000	14,000	Based on EMP	Environmental monitoring reports	PMO/DEP

Phosphorus load reduction (TP) achieved from project farms	<input checked="" type="checkbox"/>	Metric tons	800	10	50	120	150	250	Based on EMP	Environmental monitoring reports	PMO/DEP
Reduction in total consumption of pesticides in project areas	<input type="checkbox"/>	Metric tons (effective ingredients)	7,400	31	100	115	125	135	Based on PMP	PMP monitoring reports	PMO
WHO Class I pesticide residue compliance rates	<input type="checkbox"/>	%	90	92	94	96	98	100	Based on PMP	PMP monitoring reports	PMO
WHO Class II pesticide residue compliance rates	<input type="checkbox"/>	%	90	92	93	94	95	96	Based on PMP	PMP monitoring reports	PMO
Beneficiaries who have adopted project promoted crop production practices -- female	<input checked="" type="checkbox"/>	Number	0	3,000	6,000	9,000	12,000	15,000	Semi-annually	Progress reports; output verification reports	PMO
			0	600	1,200	1,800	2,400	3,000			
Crop production areas adopted project promoted practices	<input checked="" type="checkbox"/>	Ha	0	12,000	20,000	28,000	36,000	45,000	Semi-annually	Progress reports; output verification reports	PMO
Reduction in pesticide consumption in project areas	<input type="checkbox"/>	Metric tons	0	12	22	30	38	45	Semi-annually	Progress reports; output verification reports	PMO
Number of livestock waste management facilities constructed	<input type="checkbox"/>	Number	0	18	50	80	100	52	Semi-annually	Progress reports	PMO

Number of project supported pig farms in compliance of performance requirements	<input type="checkbox"/>	Number	0	18	68	148	248	300	Semi-annually	Progress reports; output verification reports	PMO/DEP
Number of policy studies completed	<input type="checkbox"/>	Number	0	0	0	5	6	0	Semi-annually	Progress reports	PMO
Technical training received by beneficiary farmers -- female	<input checked="" type="checkbox"/>	Person days	0	7,000	36,000	36,000	36,000	36,000	Semi-annually	Progress reports	PMO
			0	700	4,000	5,000	6,000	7,000			

* Pollution releases from crop production are estimated based on pollutant discharge coefficients used in previous pollution surveys in Guangdong. Performance monitoring under the project will generate project specific data to help refine such coefficients. Pollution releases from pig farms are estimated based on common waste management practices in Guangdong and pollution reduction potentials of two LWM modalities demonstrated under the GEF LWMEAP.

Annex 2: Detailed Project Description

China: Guangdong Agricultural Pollution Control (P127775)

Component 1: Environmentally Friendly Crop Production

1. Component 1 will support (a) environmentally friendly agricultural techniques and practices in a total of 30 townships in six counties/cities/districts across two municipalities (Huizhou and Jiangmen) covering an estimated project area of 45,000 ha;¹⁴ (b) the four CA pilot sites of about 100 ha in three municipalities (Huizhou, Jiangmen and Heyuan);¹⁵ and, the minimization of the release of fertilizers and pesticides into the water environment. In doing so, combinations of various technical measures for sound soil nutrient management, efficient delivery of fertilizers and pesticides, and IPM will be implemented at typical cropping system sites in Guangdong Province. These measures aim to achieve pollution reduction via (a) reduction in the use of fertilizers and pesticides, (b) increase in application and utilization efficiencies of these chemicals, and (c) improvement in soil structure and organic matters to minimize releases of these chemicals from cropping systems to the environment. For the latter, given that the province has no prior experience with no-tillage or limited tillage based CA practices, it has been agreed that this component will support CA pilots that demonstrate to provincial stakeholders technical applicability, cost implications, and the impacts of CA practices on production costs, soil fertility, productivity and pollution releases. Based on the verified cost effectiveness field results of various technical options, technical combinations will be refined and adjusted in the following years of project implementation to maximize the project's impact on pollution reduction while minimizing negative impacts on crop productivity.

2. Sub-Component 1a: Soil Nutrient Management. This sub-component will first support (i) provincial, municipal and county extension services to develop sound soil nutrient management plans that include support for sampling and analytical equipment to analyze soil nutrient situations, actual sampling and analytical exercises, and dissemination of soil nutrient information to project beneficiaries to guide them in their fertilization practices. This sub-component will then promote (ii) the use of various technical measures to improve the application and utilization efficiencies of fertilizers based on soil nutrient management plans. These measures include: (A) application of formula fertilizers to about 25,000 ha; (B) application of slow-release fertilizers to about 1,550 ha; (C) development of fertigation facilities in about 2,800 ha of vegetables and orchid farms; and (D) promotion of the three control technique (control of fertilization, crop establishment, and pest) on about 2,000 ha of rice paddy.¹⁶ With

¹⁴ These are Huiyang District, Huicheng District and Boluo County of Huizhou Municipality and Engping City, Kaiping City and Taishan City of Jiangmen Municipality. These areas were selected based on the following criteria: (a) good crop production baselines; (b) representative crop production practices; (c) potential to disseminate project results; and (d) strong technical, financial and institutional support from local governments. Based on these criteria, DOA advised the proposed project activities in Guangdong in October 2012, received and appraised proposals from a total of 8 municipalities with support of technical experts.

¹⁵ Two rice CA pilot sites are in Boluo County of Huizhou Municipality, Taishan City of Jiangmen Municipality, and two maize CA pilot sites are in Lianping County of Heyuan Municipality and Huiyang City of Huizhou Municipality.

¹⁶ The three control technique aims (a) to improve utilization of nitrogen fertilizers by controlling the ratio between the total amount of applied nitrogen fertilizers and those used in early stage of rice production; (b) to control the use of nitrogen fertilizers during rice tillering period to reduce ineffective tillering and improve earbearing teller

these interventions, this sub-component is expected to help Guangdong reduce its ammonia and TP releases by over 25 and 10 tons respectively from the 30 project towns by Year 5 of project implementation.

3. Sub-Component 1b: Integrated Pest Management (IPM). This sub-component will support (i) investment in upgrading existing pest monitoring and early warning systems; and (ii) promotion of IPM practices for key cropping systems in the project areas. Under (ii), the project will finance (a) use of high quality pesticide application equipment; (b) application of biological pesticides and low residue high efficiency pesticides; (c) procurement and installation of pest lamps and insect glue boards; (d) introduction of natural pest predators; and (e) promotion of professional pest control services. Annex 1 provides detailed target values of pesticide consumption reduction and residue compliance rates in project areas.

4. Sub-Component 1c: Conservation Agriculture (CA) Pilots. Four cropping systems with a total area of 1,700 mu (about 110 ha) are identified to carry out CA pilots in the first year of project implementation: (i) rice-rice-potato system (800 mu); (ii) corn-corn-potato system (500 mu); and (iii) corn-vegetable-potato system (400 mu). These CA pilots will aim to limit disturbance to soil systems by changing from current tillage farming practices to no-till or limited tillage practice. In so doing, soil erosion and leaching of soil nutrients can be significantly reduced, soil organic matters can be maintained/restored, and the soil is again able to retain and filter nutrients and agrochemicals.

5. For rice production, the most important technical change proposed to the production systems is the reduction and avoidance of open water in field crops: i.e. shifting from flooded to aerobic rice production, from basin irrigation to furrow irrigation, and preferably to technical irrigation, particularly drip irrigation. It is expected that the use of CA machinery will also be introduced under this sub-component to improve productivity and efficiency.

6. Sub-Component 1d: Implementation Support to Project Farmers. This Subcomponent will support agricultural extension services at the county and township levels to provide field technical support to project farmers, in particular smallholders, to ensure they can understand and properly implement project promoted crop production practices. Service payments to extension services will be closely linked to the performance of service providers, as evaluated by service recipients.

7. For smallholder activities in project villages, this Subcomponent will support existing village committees to organize farmer participation to carry out project activities under the guidance of county PMUs. Operating costs of village committees will be covered by the project based on the results of periodical evaluation of the performance of village level activities.

8. This subcomponent will also support project farmers to go undertake certification for Safe and Green Agricultural Products. Successful certification is expected to help project farmers get better access to the market to capitalize economic benefits of their environmentally friendly crop products.

Component 2: Livestock Waste Management

percentage; and (c) to improve rice spacing to limit pest infestation. The use of organic fertilizers will be closely linked to Component 2 activities (see Component 2 for details).

9. Subcomponent 2.1: Livestock Waste Management Facilities. Component 2 supports the construction and proper operations of LWM facilities at about 300 farms province-wide to promote the proper collection and treatment of pig wastes.¹⁷ This includes construction of pig waste collection and treatment facilities using one of the two LWM modalities demonstrated under the GEF LWMEAP, and proper utilization or disposal of treated solids and liquids.¹⁸ Activities to transport and distribute the treated solids and liquids to agricultural lands will be linked to Subcomponent 1(a) activities, whenever feasible. Wastewater discharged from the project financed farms, if any, will meet related national and local discharge standards. Financially, the project will provide grant support up to 65% of the total investment costs of the project financed LWM facilities, with 50% from the IBRD loan proceeds and 15% from the provincial counterpart funding.¹⁹ Farm owners will be required to contribute at least 35% of the total investment costs. Proposals where the farm contributions represent a higher percentage of total costs will be given higher priority to receive project financing. This subsidy scheme will be reviewed and adjusted during project implementation.

10. The selection criteria for participating pig farms are: (a) a SPP of 3,000 pigs or more; (b) located outside of areas banned for livestock production (as defined by the provincial and local governments); (c) willingness to participate; (d) commitment to achieve environmental compliance including full treatment of pig wastes and proper utilization and/or disposal treated solids and liquids; (e) sound financial performance; and (f) access to sufficient resources to fund at least 35% of approved investment costs. A standard financial analysis template and mini-project implementation plan (mini-PIP) template have been developed and adopted during project preparation to evaluate the financial viability and technical feasibility of proposed LWM facilities. At appraisal, a total of 17 pig farms were confirmed ready for the first year's implementation. Remaining farms will be identified during project implementation following the established selection and appraisal mechanism. It is expected that if properly established and managed, these 300 LWM facilities will help Guangdong reduce about 45,000 tons of COD, 5,000 tons of ammonia, and 240 tons of TP releases from its livestock sector by Year 5 of project implementation.

11. Subcomponent 2(b): High Rise Pig Production Pilots. This subcomponent will support the incremental construction costs of two new and innovative high-rise pig production facilities. Different from traditional single-floor flash farms, this technology involves a two-story building with finishing pigs housed on the second floor, pig wastes separated through slatted floor installations from the second to first floors, and pig waste composting using bedding materials occurring on the first level. Due to its high costs, it is expected that this technology will be applicable only to new farms. Successful implementation of this innovative pilot will equip Guangdong with a new production model that would fundamentally address pollution issues from its pig production.

¹⁷ It is estimated that these 300 farms will account for about 8% of total SPP of the province.

¹⁸ The two LWM modalities are energy-environmental protection model and the energy and ecological utilization model. Both modalities are based on anaerobic digestion (AD) technologies with the first model coupled with segregation of solids and liquids and aeration of digestate before discharge of treated wastewater into the environment and the second coupled with full utilization of treated wastes and wastewaters in agricultural production activities.

¹⁹¹⁹¹⁹ The percentage of 65% is used based on experience of the GEF LWMEAP and consultation of pig farms during project preparation. It will be reviewed and adjusted during project implementation based on actual participation of targeted pig farms.

Component 3: M&E, Capacity Building and KM

12. Component 3 will have three subcomponents: (a) M&E; (b) Capacity Building; and (c) KM.

13. Subcomponent 3a: M&E. This subcomponent will support (i) routine M&E activities on project implementation progress; (ii) safeguard-related M&E activities; (iii) community-based M&E activities; and (iv) performance M&E activities. The first group of activities will monitor and verify how various project activities have been implemented on the ground. The second group then focuses on how various safeguards instruments are implemented at project sites. Geo-referenced environmental monitoring data obtained from this group of activities will be collected and shared with DEP for their review and enforcement activities, if needed. Such data will also be linked by DEP to its own surface water quality monitoring data to help the province better monitor and manage its surface water quality issues. The third group of activities will evaluate project impacts on project communities. Finally, the last group of activities will evaluate results and effectiveness of project-financed pollution reduction activities by monitoring, for example, the use and release of nutrients and pesticides from project financed crop sites, the release of pollutants and the generation and uses of biogas and treated wastes from project financed pig farms, and actual feedbacks from project beneficiaries. Such results will be used to evaluate cost effectiveness and acceptance of project supported technologies and practices, as well as evaluate the project impacts at specific sites and at project areas. As such, these results will help project refine its support on various technologies and practices. In addition, these results will be used as disbursements of LWM investment activities under Component 2 and some activities under Component 1 to incentivize project beneficiaries to achieve or exceed agreed performance levels.

14. The project's M&E system is developed based on the country's existing performance reporting and verification system under its 12th FYP on pollution reduction and actual monitoring activities to be carried out at the project sites and monitoring activities performed under the GEF LWMEAP Project. The 12th FYP system has detailed M&E methodology and verification procedures for COD and ammonia discharges from livestock production, but adopts only a general approach to estimate COD and ammonia releases from crop production. It is noted that project financed on-site monitoring activities will provide concrete data to support the province's verification activities and provide tested M&E methodology and verification procedures for COD and ammonia releases from crop production for the province and China. As noted above, project M&E data will be shared with DEP to ensure that project financed monitoring data could be fed into DEP's existing water quality monitoring information system.

15. Subcomponent 3b: Capacity Building. This subcomponent will support (i) development of DOA's capacity to monitor agricultural pollution; (ii) technical and policy studies; (iii) technical training; and (iv) knowledge learning events. In terms of monitoring capacity development, this subcomponent will support the upgrade of monitoring equipment in one provincial and two regional agricultural environmental analytical laboratories, as well as the procurement of vehicles for agricultural authorities to perform agricultural environmental monitoring activities.

16. This subcomponent will support a total of 11 technical and policy studies on (a) agricultural pollution control policies (with a focus on sustainable financing mechanisms, such as payments for environmental services and integrated value chain and competitiveness development into pollution management interventions). Specifically, this work will aim to

initiate provincial discussions on whether and how existing input-oriented subsidies could be reformed to output-oriented incentive schemes. Additional technical and policy studies for agricultural pollution control will be developed during project implementation; (b) high-rise pig production and CA techniques and machinery development; (c) fertigation technologies to improve nitrogen utilization efficiencies in rice production; (d) formulation of feed rations for pollution reduction; (e) rapid composting techniques for pig waste management; (f) effective collection and disposal systems for sound management of pesticide packaging materials; and (g) development of an effective regional agricultural pollution monitoring system.

17. For technical training, this subcomponent will provide appropriate training to (a) project implementers; (b) project management staff; and (c) stakeholders. Training to project implementers will focus on (i) agricultural technocrats and technicians of municipal, county and county extension service centers with the aim of helping them understand the technical aspects of environmentally friendly crop production technologies and practices promoted by the project; (ii) participating farmers, cooperatives and firms to help them master project promoted technologies and practices; and (iii) participating crop farms, cooperatives and firms on certification of safe and green agricultural products. Project management training will focus on PMO and PMU staff and cover all project management topics. Stakeholder training will focus on high and primary school students to improve their environmental awareness in general and promote interaction with their parents on environmentally friendly agricultural production practices.

18. In terms of knowledge learning events, this subcomponent will organize study tours for agricultural technocrats and technicians at all levels to learn about best domestic and international practices on sustainable and environmentally friendly crop and livestock production.

19. Sub-Component 3c: Knowledge Management. This subcomponent will support knowledge management activities to capture and disseminate lessons and experiences learned from project implementation within the province and nationally, through publications on project results, on the project's website, and at domestic and international workshops and conferences. Guangdong will also promote the project experience worldwide through the GEF supported networks such as the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA), GEF IW-Learn (International Waters Learning Exchange and Resource Network), and the GEF Biennial International Waters Conference. Specifically, this Subcomponent will set aside 1% of the GEF grant to support Guangdong's participation in GEF IW-Learn activities. Lessons learned from the project will feed into a GEF financed, PEMSEA managed medium-sized KM project (MSP) under the same World Bank/GEF program - Scaling Up Partnership Investments for Sustainable Development of the Large Marine Ecosystems of East Asia and their Coasts. Under the MSP, lessons learned from this, and other projects under the program, will be incorporated to promote regional learning, capacity building, replication, scale-up policy dialogues and support policy changes.

Component 4: Project Management

20. This component supports the operational costs of project management incurred at all levels by the various project management entities. Specifically, the component will support (a) daily project management activities at the PMO and PMUs; and (b) project launch, annual review, mid-term and completion workshops. Daily project management will focus on proper functioning of the PMO and PMUs on financial management (FM), disbursement, procurement,

construction supervision, verification and reporting activities. Reported data will be logged into a project management information system (MIS) and then analyzed to track project implementation progress on procurement, physical construction, disbursement and counterpart funding provision. Findings of daily management will feed into annual and mid-term implementation review meetings to enable Guangdong to make necessary adjustments in project implementation.

Annex 3: Implementation Arrangements

China: Guangdong Agricultural Pollution Control (P127775)

Project Institutional and Implementation Arrangements

1. For preparation and implementation of this project, Guangdong has set up the following institutional structure at the provincial level:

- a. Provincial Steering Committee (PSC). The Provincial PSC, headed by a Vice Governor, is to oversee the preparation and implementation of the proposed project, with representatives from the Provincial Development and Reform Commission (DRC), Department of Finance (DOF), Department of Environmental Protection (DEP) and Department of Agriculture (DOA). The PSC will hold annual meetings to review key issues identified during preparation and implementation. A liaison team has been formed with mid-rank officials of the four PSC member agencies to coordinate project preparation and implementation issues on a regular basis.
- b. Provincial Leading Group (PLG) at DOA. The PLG is set up under DOA, led by the DOA Director General (DG) with support of two deputy DGs (DDGs). Its members include directors of 10 relevant DOA divisions in charge of crop and livestock production and agricultural pollution control in the province. The PLG supervises DOA's activities during project preparation and implementation.
- c. Provincial Project Management Office (PMO). Headed by a DOA, DDG and three DOA directors, the PMO acts as the implementing agency of this project. In addition to managing project implementation, it assists the PLG in reviewing and making decisions on major project preparation and implementation issues that are within DOA responsibilities. It also supports DOA in PSC activities. Its key staff members include a FM specialist, a procurement specialist, a M&E specialist and a safeguards specialist.
- d. Technical Expert Group (TEG). Reporting directly to the PPLGs, TEG has been set up at DOA with 23 technical experts on various technical issues (such as crop production, soil and fertilization, LWM, agricultural mechanization, plant protection etc.). TEG members will help review technical documents and designs, evaluate and oversee project processes, and identify problems and provide technical solutions.

2. At the municipal and county levels, the two project municipalities and six project counties involved in Component 1 have developed similar institutional set-ups, with a steering committee chaired by a deputy head of the respective government, a leading group headed by the director of agriculture bureaus, and PMUs headed by deputy directors of agriculture bureaus.

3. Project implementation arrangements are detailed in the Project Implementation Manual (PIM). Specifically, DOA, through its PMO, will be responsible for overall implementation of this project. It will directly manage implementation of Component 1(c), Components 2, 3 and 4. For remaining activities under Component 1, DOA, through the PMO, will rely on county Agriculture Bureaus and their PMUs to identify project beneficiaries, confirm project activities at specific project sites, provide extension services to support project beneficiaries to implement such activities, report local adoption of project promoted crop production technologies/practices,

and facilitate the independent verification of outputs and disbursement of project subsidies to verified project beneficiaries. As noted in Annex 1, for Component 2, DOA has developed selection criteria and an appraisal mechanism to select project farms. It will appraise technical feasibility, financial viability, performance commitments, and safeguards compliance of investment proposals from eligible farms based on agreed procedures prescribed in the PIM. It will oversee implementation of project financed investment activities.

Financial Management, Disbursements and Procurement

Financial Management

4. The financial management capacity assessment identified the following principal risks: (a) most project counties do not have experience with Bank-financed projects, and (b) project activities under Component 1 are complex and include innovative types of payments including subsidies, payment of incremental investment costs, output-based disbursements and small grants.

5. Agreed mitigation measures to address the above risks include: (a) financial management training (formal and ad hoc) to be provided to the project financial staff; (b) close monitoring and guidance from PMO as well as the Bank's supervision; (c) an IC card system will control the portion of costs that farmers are required to pay and the semi-annual subsidy payments to suppliers, (d) payments to finance farmer production costs, as an incentive for their participation in the Project, will be paid to the beneficiaries after verification of their compliance with pre-determined Project requirements, and (e) an efficient M&E system will be established to regularly monitor project objectives.

6. The overall residual financial management risk after mitigating measures for the project is assessed as *Substantial*.

7. Budgeting. The first year implementation plan has been prepared by each project county. The budget for counterpart funds committed by the provincial government will be reviewed and approved by the People's Congress and will be included in their sectoral budget. Based on the approved budget and implementation progress, DOF will provide government appropriations to the project. A mini-PIP should be prepared and approved by the Bank for each farm financed under Component 2. Budget variance analysis will be conducted on a semi-annual basis by related PMO/PMU to identify corrective actions that may be necessary. The Bank will work with the provincial PMO to supervise the project budgeting system, to enhance budget preparation, and budget execution reporting during project implementation.

8. Accounting and Financial Reporting. The administration, accounting and reporting of the project will be set up in accordance with Circular #13: "Accounting Regulations for World Bank-financed Projects" issued in January 2000 by Ministry of Finance.

9. It was agreed that the county PMU would be the lowest level which is responsible for disbursement and financial management related operations under Component 1 and the activities implemented by county PMUs under M&E, knowledge management and project management

components. For Component 2 and other activities, the provincial PMO will take this responsibility.

10. County PMUs and PMO will be managing, monitoring and maintaining their project accounting records for the activities they execute. Original supporting documents will be retained by PMO and county PMUs respectively. PMO is responsible for preparing the project consolidated financial statements. The unaudited semi-annual project interim financial reports will be prepared in accordance with Circular #13 (agreed with MOF) and furnished to the Bank by PMO no later than 45 days following each semester (the due dates will be August 15th and February 15th), in form and substance satisfactory to the Bank.

11. Internal Control. A complete PIM has been prepared to provide detailed guidance on project implementation. The implementing agreement signed between PMO and the beneficiary will clarify the responsibility of each party, the technical requirements, the subsidy and the verification procedures, etc.

12. The key internal controls relating to Component 1 of the Project include: (a) Financing for goods, consulting services and training associated with the laboratory, CA pilot activities and the pest prevention/control equipment will use the Bank's traditional procurement methods and traditional process and payment controls will apply; (b) Financing for other Project activities including: (i) formula/slow-release fertilizers; (ii) biological pesticides and low residue high efficiency pesticides; (iii) unified professional IPM services; (iv) fertigation; (v) high quality pesticide application equipment; and (vi) incentives to the associations/firms which will implement the CA pilots, will make use of the following customized controls that have been designed for the Project:

- a. For Activities (i), (ii) and (v), it is anticipated that county PMUs sign an implementing agreement with a project village/association. The contents of this agreement will include: (1) activities to be implemented; (2) technical requirements/procedures for carrying out such activities; (3) the pre-determined subsidy or incentive payment; (4) allocation of funds received; (5) the responsibility of related entities; and (6) related requirements related to the incentive payment to the villages/associations.
- b. The village/association organizes farmers to implement project activities in line with the technical requirements/procedures in the agreement. The participating farmers will purchase the fertilizers, pesticides and equipment from the qualified suppliers using the IC card provided by the provincial PMO and pay the supplier the portion of the total cost that corresponds to their accounts after deducting the pre-determined subsidy. The provincial PMO will settle the subsidy bills with the suppliers semi-annually based on IC card records and after verification of the county PMU.
- c. The county PMU will provide the required technical support and training to the parties involved.
- d. Once the project activities are completed, the county PMU conducts verification exercises according to the requirement stipulated in the agreement. A certificate will be issued by the county PMU if the completed activities are acceptable, the required output has been generated, and/or compliance with required procedure has been verified.

- e. The village/association should publicize the allocation of the funds that it receives so that the farmers can supervise the use of the grant.
- f. For Activity (iii), a tripartite agreement will be signed among county PMUs, villages/associations and the IPM service provider (firms or associations) for the unified professional IPM service. The contents of agreement should refer to the above-mentioned implementation agreement. Funds will be delivered to the IPM service provider based on IC card records and after the completed activities are verified by the county PMU.
- g. For Activity (iv), the county PMU will sign an implementing agreement (with the similar contents of the agreement in item (a) with the association, vegetable farm and big planting farmer and the subsidy will be delivered to them based on IC card records and after the county PMU verifies the activities completed.
- h. For Activity (vi), the county PMU will sign an implementing agreement (with the similar contents of the agreement in item (a)) with the associations/company and the incentive payment will be delivered to them if the pre-determined requirements have been met.

13. The DOA is developing an IC card system that will manage subsidy provisions to project beneficiaries of Activities (i), (ii), (iii) and (v). The IC card system will contain basic information regarding project beneficiaries and their level of eligibility in terms of project support. Such information will be disclosed and open for comment on county PMU websites and in the project villages before it is uploaded into the IC card system. Project beneficiaries will receive individual IC cards loaded with their personal information. They can use the cards to procure eligible goods and services at a subsidized price from DOA certified suppliers and service providers. PMUs and PMO will collect IC card records and verify the provision of goods and services. Based on such records PMU and verifications, DOA will make payments to the suppliers and service providers.

14. For Component 2, with the exception of the high-rise pig production pilot facilities, the Bank's traditional procurement and disbursement method will be used. The Provincial PMO will take the leading role for the Component. Contracts describing the payment terms and conditions will be signed among the PMO, pig farms and contractors. For the high-rise pig production pilot facilities, the PMO will sign an agreement with the pilot farms and pay the incremental construction costs for the facilities to the farms, after verification that the construction has been adequately carried out.

World Bank Disbursements and Funds Flow

15. Disbursement. Three disbursement methods: advance, reimbursement and direct payment are available for the project. The primary Bank disbursement method will be advances to the Designated Accounts (DAs). Withdrawal Applications (WA's) will be prepared to request Bank disbursements and to document the use of Bank financing. WA's will include supporting documents in the form of Statement of Expenditures (SOEs) and Summary Sheets (SS) and source documents identified in the Disbursement Letter issued by the Bank.

16. The segregated DAs in US dollars, one for the IBRD loan and the other for the GEF grant, will be opened at a commercial bank acceptable to the World Bank and will be managed by the Guangdong Provincial DOF. The ceiling of the DA will be determined and documented in

the Disbursement Letter. DOF will be directly responsible for the management, maintenance and reconciliation of the DA activities of the project.

17. **The World Bank loan/GEF grant** will be disbursed against eligible expenditures (taxes inclusive) as in the following tables:

Disbursement Categories for the IBRD Loan

Disbursement Categories	IBRD Loan	
	Allocated amount (US\$ million)	Percentage of Expenditures to be financed (percentage)
(1) Goods and works under Component 2 (except the high rise pilots)	56.72	50%
(2) Subfinancings under Component 1(a) (ii) (A), (B) and (C) and Component 1(b) (ii)	34.15	100%
(3) Under Components 1 (a) (i), 1 (a) (ii) (c), 1 (b) (i), 1 (c), 2 (b), 3 and 4 of the Project: works, goods, non-consulting services, consultants' services, Operating Costs, Training and Workshops and Sub-financings	8.08	100%
() Front-end fee	0.25	100%
Total	100	

Disbursement Categories for the GEF Grant

Disbursement Categories	GEF grant	
	Allocated Amount (US\$ million)	Percentage of Expenditures to be financed (percentage)
(1) Works, goods, non-consulting services, consultants' services, Operating Costs, Training and Workshops and Sub-financings.	5.1	100%
Total	5.1	

18. Fund Flow and Eligible Expenditures. For most activities of Components 1 and 2, contractors and suppliers will be paid by the provincial PMO directly once the provincial PMO receives funds from the DAs.

19. Under the four CA pilots, the Project will finance 100% of the incremental cost of the specialized equipment required for the pilots. The PMO will pay suppliers for the purchase of such equipment (e.g. seeders). As an incentive for farmer participation in the Project, the Project will also partially finance pilot farm production costs provided that farmers follow specified procedures. Given difficulties in determining incremental production costs, farmers will be paid a flat amount, estimated at USD 10,000 per year, in the case of full compliance. Partial payment of the flat amount may be paid in the case of partial compliance. Incentive payments to farmers will be made by the county PMU via municipal PMUs and the provincial PMO.

20. Farmers will be offered the option of professional pesticide service or subsidies for the payment of costs for simple pesticide application equipment and pesticides. Fertilizer costs will also be subsidized. The PMO will pay subsidies directly to suppliers as described in the Internal Control section.

21. The cost of simple fertigation systems to deliver inputs to crops will be financed through the output-base disbursement method. The standard unit cost of the system is calculated by the Project and paid to the farmer on certification of its installation and proper functioning. Standard unit system costs will be reviewed periodically to ensure the unit cost adheres closely to the cost of its component inputs.

22. Village Committees will be used to work with the large number of farmers. The operating cost incurred by the Village Committees to organize, communicate extension worker technical advice, monitor farmers, and other activities will be financed by the Project through small grants of USD 1,000 paid semi-annually. Payment of the small grants will be considered an eligible Project expenditure and will be triggered by the Village Committee submitting an Implementation Progress Report and acceptable evaluation reports received from farmers. Documentation of the use of the small grants will not be required by the Bank because of the small and highly fractionalized values. Rather, the Project will apply a social control by requiring Village Committees to disclose the use of the grants to farmers.

23. For certification of Green Agriculture Products, the Project will partially finance the cost incurred by farmers for registration and certification. Payment will be made to the farmer or cooperative and be triggered by certification. Three fixed amounts, corresponding to the three certification categories and their corresponding costs, will be paid.

24. The County PMO and PPMO will prepare SOEs/SSs and other supporting documents to request reimbursement of expenditures and submit them for approval and verification by GPFB. GPFB will transfer the reimbursement to PPMO directly and prepare and send a withdrawal application to the World Bank to replenish the DAs as needed.

25. For the high-rise pig production pilot facilities under Component 2, the provincial PMO will pay the incremental construction costs of the facilities to the farms directly, after verification that the construction was adequately completed.

26. The following disbursement table should be prepared by county PMO and attached to the withdrawal application when requesting reimbursement from the Provincial Finance Bureau. The table should be maintained by the county PMO for the Bank's post review and auditors' annual audit.

List of Subsidy under Component I
 第一子项补助明细表
 Year 年度

County (县) :

#	Beneficiary	Activity implemented	Subsidy disbursed	Supplier	Remarks
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编号	受益人	实施的活动	支付的补助	供货商	备注

27. **Auditing.** The Guangdong Provincial Audit Office (GPAO) has been identified as the auditors for the project. GPAO has extensive experience auditing Bank-financed projects. An annual audit report will be issued by GPAO. The annual audit report of project financial statements will be due to the Bank within 6 months after the end of each calendar year. Following the World Bank’s formal receipt of the audited financial statements from the borrower, the World Bank will make them available to the public in accordance with the World Bank Policy on Access to Information.

Procurement

28. **Procurement Assessment.** A procurement assessment has been conducted, procurement risks identified and mitigation measures agreed to. The main risks identified are that project activities are scattered across a multiplicity of actors, and that possible delays and non-compliance may arise because the municipal and county PMUs for Component 1 activities are not familiar with Bank’s procurement policies and procedures. The agreed mitigation measures are: (a) the provincial PMO has assigned procurement tasks to a staff member who has procurement experience from the GEF LWMEAP; (b) a PIM acceptable to the Bank which specifies procurement management arrangements to guide project procurement activities has been adopted; (c) during project preparation, the provincial PMO and PMU staff received training in procurement in Bank-financed projects and will receive continuous training in procurement and contract management throughout project implementation; and (d) a Procurement Agent with experience in Bank-financed projects has been hired by the provincial PMO to provide project procurement cycle management services.

29. **Applicable Guidelines.** Procurement will be carried out in accordance with the “*Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans & IDA Credits & Grants by World Bank Borrowers*” dated January 2011; and “*Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*” dated January 2011; and the provisions stipulated in the Loan and Grant Agreements. National Competitive Bidding (NCB) shall be carried out in accordance with the *Law on Tendering and Bidding of the People’s Republic of China* promulgated by Order of the President of the People’s Republic of China on August 30, 1999 subject to the modifications stipulated in the Loan and Grant Agreements in order to ensure broad consistency with World Bank Procurement Guidelines.

30. Procurement of Works. The project will provide financing to about 300 pig farms for the construction of facilities to collect and treat livestock wastes. The contract size will be determined during implementation when the procurement demands and schedules of project financed farms are confirmed. Procurement of the LWM facilities will be managed by the provincial PMO. Dependent on the contract size, ICB (International Competitive Bidding), NCB (National Competitive Bidding) or Shopping procedures would be followed.

31. Procurement of Goods and Non-consulting Services. Goods to be procured under the project include: (a) equipment for livestock waste treatment; (b) environmental monitoring and analytical equipment and vehicles; and (c) office equipment for the provincial PMO and PMUs. Non-consulting service contracts will be procured for the purposes of: (a) public awareness; (b) knowledge management and scale-up activities; and (c) organization of workshop, training and study tours, as needed. Special equipment for the CA pilots under Subcomponent 1(c) may be procured through Direct Contracting under the circumstances stipulated in paragraph 3.7 of the Procurement Guidelines.

32. Selection of Consultants. Consulting services will be needed for Component 1 and 2 activities for technical support, and for Component 3 on M&E activities, technical and policy studies and knowledge management activities. Government-owned universities, research centers or other institutions may be included in shortlists of consultants, provided that they possess the relevant qualifications and they are not in a situation of conflict of interest. In such cases, Quality Based Selection (QBS) or CQS (Selection Based on Consultant's Qualifications) (for small assignments) would be used, if the shortlist also includes consulting firms. Single-source selection (SSS) shall be used only in exceptional cases and shall be specified in the Procurement Plan. A sufficiently detailed justification, including the rationale for SSS instead of a competitive selection process, and the basis for recommending a particular firm or individual, will be required.

33. Community Participation in Procurement (under Component 1). Under Component 1, beneficiary farmers may procure and use a limited number and small quantity of tangible Goods and Services for sound soil nutrient management, efficient delivery of fertilizers and pesticides, high quality manual pesticide sprayers, professional pest management services and IPM products. The procurement of such activities will be carried out using the Community Participation in Procurement procedures under Paragraph 3.19 of the Procurement Guidelines. The procurement procedures and payment conditions, review and approval procedures have been worked out and outlined in the PIM, which will be finalized before negotiation. The outline of the PIM related to community participation in procurement is summarized as the following:

- a. according to the project demands, the provincial PMO will certify qualified Suppliers and Manufacturers with the limitation of the maximum price for providing of specified goods (fertilizer; pesticide, manual pesticide sprayers, etc.) to farmers;
- b. Farmers will procure necessary items competitively among several certified suppliers or manufacturers based on the delivery date, quality of services and quotations;
- c. Farmers will use the IC Card (per piece/per farmer) which is designed and developed by the project to procure for such agreed goods/services at subsidized prices;
- d. PMO and county PMUs will monitor and check the records of IC Cards to verify the quality, quantity and timeline of goods/service provided;

- e. The TEG at provincial and county levels will provide instruction and training as well as relevant services based on the farmers' needs.; and
- f. all information related to the community participation procurement information will be disclosed at the township and village levels. Any complaints or questions from community will be handled by the PMO through villages and townships.

34. During project implementation, the farmers will follow technical advices provided by PMO to carry out such procurement activities.

35. Procurement Thresholds. Procurement thresholds for procurement methods and Bank prior review are presented below:

Thresholds for Procurement Methods and Prior Review

Expenditure Category	Contract Value Threshold (US\$)	Procurement Method	Prior Review Threshold (US\$)
1. Goods and Non-Consulting Services	≥3,000,000	ICB	All
	<3,000,000	NCB	≥3,000,000 and first two contracts
	<100,000	Shopping	First Contract
	NONE	Direct Contracting	All
2. Works and Supply and Installation of Plant and Equipment	≥25,000,000	ICB	All
	<25,000,000	NCB	≥15,000,000 and first two contracts
	<200,000	Shopping	First Contract
3. Consultants Services	≥300,000	QCBS/QBS	All
	<300,000	CQS	≥300,000 and first contract
		Individual consultant	First contract
		Single source selection (firm)	All
		Single source selection (individual)	≥20,000
4. Community Participation under Component 1	<50,000	Community Participation	None

36. Procurement Plan (PP). A PP for the first 18 months of project implementation has been discussed during appraisal and will be finalized before negotiation. The PP will be updated annually (or as needed) by the PMO and PMUs to: (a) reflect project implementation; (b) accommodate changes that should be made; and (c) add new packages necessary for the project. Each update will be subject to Bank prior review. Procurement Plans will be published on the World Bank website.

37. Training and Workshops. Plans for training and workshops have been developed by the PMO and commented upon by the Bank at appraisal. The plans will be included in the project annual work plan for the Bank's review. Expenditures incurred in accordance with the agreed plans for training and workshops will be the basis for reimbursement. Any special training or study tour which is not easy to be organized by the provincial PMO may be contracted out to a qualified organizer through non-consulting service procurement.

38. Retroactive Financing. Procurement activities that require retroactive financing will be identified in the procurement plan and will be carried out in accordance with the Procurement Guidelines. Prior review will be required for all such activities.

Contracts to be procured under Retroactive Financing

Reference Number	Description	Procurement Method	Domestic Preference (Yes/No)	Review by Bank (Prior / Post)

39. Frequency of Procurement Supervision and Post-review by the Bank. Procurement supervision will be carried out once a year. Contracts not subject to prior-review will be subject to post-review. The Bank will carry out procurement post review on annual basis with an initial sampling rate of tenth percent. This rate will be adjusted periodically during project implementation based on the performance of the project implementing agencies.

Summary of Subfinancing Arrangements

40. The detailed procurement and disbursement arrangements for the above mentioned subfinancing activities are summarized below.

Activity	Financing Sources	Procurement Method	Disbursement Approach	Expenditures to be financed and Disbursement Procedures
Formula/slow-release fertilizers and three control technique implemented by farmers	IBRD loan and counterpart funds	Community participation method	IC Card System	Pre-determined subsidy to cover part of fertilizers costs will be paid to the suppliers once the farmers have purchased the fertilizers and paid their own share. The suppliers claim the subsidies based on IC card records.
Fertigation	IBRD loan and counterpart funds	Community participation method	Implementation agreement	Pre-determined subsidy to cover part of incremental investment costs will be paid to the cooperatives, vegetable farm and big planting farmer once county PMU verifies the outputs following the procedures specified in the PIM.
Biological pesticides and low residue high efficiency pesticides implemented by farmers	IBRD loan	Community participation method	IC Card System	Pre-determined subsidy to cover part of pesticides costs will be paid to the suppliers once the farmers purchase the pesticides and paid their own share. The suppliers claim the subsidies based on IC card records. .

High quality pesticide application equipment	IBRD loan	Community participation method	IC Card System	Pre-determined subsidy to cover part of equipment costs will be paid to the suppliers once the farmers purchase the equipment and paid their own share. The suppliers claim the subsidies based on IC card records.
Professional pest management service	IBRD loan	Community participation method	IC Card System	A tripartite agreement will be signed among the county PMU, village and the company. Subsidies will be paid to the company.
Registration of green Agro-products	Counterpart funds	No World Bank procurement	Certification records	Pre-determined amount will be paid to the associations and vegetable farms once the certificate is obtained (one time).
Incentive payments for village committees	Counterpart funds	No World Bank procurement	Implementation Agreement	Semi-annual payments to cover operating costs of village committees will be delivered to villages after (a) a village committee's submission of semi-progress report: and (b) farmers' evaluation of the village committee's performance.
CA pilots activity	GEF Grant	No World Bank procurement	Implementation agreement	Pre-determined payments to cover partial operating costs incurred by the CA pilot firms/cooperatives will be delivered to the firms/cooperatives on an annual basis after the PMO verifies that project promoted practices have been followed.
Pilot high-rise pig production facilities	IBRD loan and counterpart funds	No World Bank Procurement	Implementation agreements	Pre-determined payments to cover incremental construction costs incurred by the pilot farms will be delivered to the farms after the PMO verifies construction completion.

Environmental and Social (including safeguards)

Environmental

41. Environmental Assessment (OP 4.01). The Project is classified as a Category B project based on the type, location, sensitivity, and scale, as well as the nature and magnitude of project activities and their potential environmental impacts. An EMP was prepared by the Institute of Pearl River Water Resources Protection in accordance with domestic and Bank requirements. The EMP includes Environmental Code of Practice (ECOPs), Environmental Management Framework (EMF) and Livestock Waste Management Plan (LWMP).

42. Potential Environmental Impacts/ Risks. Component 1 will support activities to reduce the use, improve the utilization, and reduce releases of excessive pesticides and nutrients from

agricultural lands. Component 2 will support construction of biogas facilities at existing commercial livestock farms in possession of existing licenses and permits issued by local environmental and other relevant government agencies. Therefore, for both components, no sensitive locations and environmental issues are expected.

43. By reducing pollution discharges from project sites, it is expected that project interventions will generate significant and positive environmental benefits. Some negative short-term construction and long-term operational impacts may result from project implementation. During the construction period of project financed facilities, construction activities will lead to limited negative impacts on soil erosion, ambient air, water, acoustic environments, solid wastes etc. These negative impacts will be small in size, short-term, temporary and site-specific. During the operation phase of these facilities there will be long term impacts such as wastewater treatment, livestock wastes disposal, operation and maintenance of biogas facilities.

44. Mitigation Measures. Mitigation measures have been built into the project design to address potential negative impacts during construction and operation of project financed facilities, and these have been documented in the EMP. With mitigation measures properly implemented, the potential adverse impacts will be avoided, eliminated entirely, minimized or mitigated to an acceptable level. All mitigation measures related to contractors will be included in the bidding documents and the corresponding contracts.

45. ECOP. The EMP includes ECOPs to address potential negative impacts associated with crop production activities under Component 1. A set of ECOPs was prepared for each type of investment or construction activity under Component 1. The ECOPs will be included as part of the PIM. ECOPs are prepared based on national norms, practices proven in other Bank-financed projects and the practice recommended in the Environmental Health and Safety Guidelines of the World Bank Group. They specify all aspects of environmental management issues during the whole project cycle including, but not limited to, site preparation, erosion control, construction dust management, air pollution control, noise impact control, water pollution control, waste management, public and workers' health and safety, as well as consultation for environmental aspects. It also includes the reporting and supervision arrangements for the implementation phase of the project.

46. EMF. The EMP includes an EMF to address potential negative impacts associated with LWM activities under Component 2. Most of the participating livestock farms will be identified and appraised during project implementation. As such, the EMF was prepared with clearly defined objectives, procedures, institutional framework, and implementation arrangements for identifying and managing potential environmental impacts from proposed new LWM facilities. It includes the implementation of agreed actions, and supervision, monitoring, and evaluation. It also addresses mechanisms for public participation and redress of possible grievances, and includes the specific screening tool that is recommended for use on all sub-projects of Component 2.

47. LWMP. It is expected that three LWM modalities will be financed: two proven technological models under the GEF LWMEAP and one pilot model demonstrated at one trial farm. A LWMP for each model has been prepared. The LWMP includes a set of design standards

for livestock waste management facilities and specifies procedures (do's and don'ts) such as waste collection, facility maintenance, manure and recordkeeping, etc. It includes both generic and specific mitigation measures applicable during the operation phase for each type of facility.

48. Environmental Monitoring. A detailed environmental monitoring program was prepared and incorporated into the EMP, consistent with national requirements that call for such analysis for agricultural pollution sources discharge load reduction plans, as well as in compliance with the Bank requirements and international best practices on agricultural pollution monitoring.²⁰ It details the environmental monitoring required during the project operational phase, including parameters to be monitored, locations, frequencies, monitoring agency and budget estimates. The environmental monitoring has been integrated and budgeted for under Component 3 of the project.

49. Pest Management (OP4.09). Component 1 will support activities to scale up IPM practices, such as promotion of the use of biological, high efficiency and low toxicity pesticides, and high efficiency application equipment. This has triggered OP 4.09. A PMP acceptable to the Bank has been prepared that describes major pest issues, pesticide management methods, pesticide management organizations and their respective responsibilities in the project areas, environmental, occupational and safety risk assessment, monitoring and evaluation activities, and capacity building for project stakeholders. Its proposed pest and disease control and management methods emphasize IPM approaches and recommend various application approaches under different conditions. It provides a list of pesticides and herbicides that may be used under the project in compliance with World Health Organization's recommended categories. Implementation of the training and monitoring programs was budgeted in the project cost.

50. Public Consultation and Information Disclosure. During the preparation of EMP, public consultations including expert consultations, questionnaires, meetings and interviews, were conducted with the project's different stakeholders. This included persons of different gender, socioeconomic and educational backgrounds, groups, and occupations. In total, about 1,153 people were consulted. The project information was disclosed at project towns/villages, communities, and government websites. The majority of those consulted expressed strong support for the project. The EMP incorporated countermeasures to address any concerns raised by those consulted.

51. In accordance with the Bank's information disclosure policy, on January 15, 2013 the EMP and PMP were disclosed in the project areas and on websites of the local government agencies, and made accessible at PMOs. The EMP and PMP were first disclosed at the World Bank Infoshop on February 22, 2013. Final versions of these documents were disclosed locally and at the Infoshop following appraisal.

Social

²⁰ The 12th FYP has a detailed M&E methodology and verification procedures on COD and ammonia discharges releases from livestock production but only a general approach to estimate COD and ammonia releases from crop production. It is expected that project financed on-site monitoring activities will provide concrete data to support the province's verification activities and provide a tested M&E methodology and verification procedures for COD and ammonia releases from crop production for the province and China.

52. RPF implementation. A RPF for the entire project was prepared by Guangdong and agreed with the Bank. The draft RPF was disclosed locally on DOA's project website on February 22, 2013 and on InfoShop on February 22, 2013. The final RPF was disclosed locally on and on InfoShop following appraisal. An abbreviated Resettlement Plan (RP) will be prepared by Guangdong in line with the RPF and reviewed by the Bank, should any land related issues be identified during project implementation.

53. Implementation of the RPF will be supervised by the Bank. RPs prepared during project implementation will be monitored and evaluated by an external monitor, the World Bank and related municipal governments. The PMO will be responsible for reporting on resettlement progress to the Bank. The Bank's task team and PMO will jointly monitor and evaluate resettlement results and recommend corrective actions as appropriate and necessary.

54. Consultation/Participation/Gender. A Social Assessment was carried out to investigate the social and economic baseline of project areas/farms, and to integrate attitudes and opinions from the participants into the project design. Additional consultation activities will be performed as part of M&E activities to collect feedback from project beneficiaries on project activities. For female beneficiaries, the consultation will also have a focus on gender issues. Such information will be used to help further refine project activities during implementation.

55. Capacity. Through the successful implementation of the GEF LWMEAP, DOA has developed solid project management capacity, including a good understanding of the Bank safeguard policies and requirements. The DOA PMO has recruited competent and experienced staff and been budgeted with adequate resources. A dedicated staff was appointed to manage safeguard issues of this project. Safeguard training was provided to PMO staff during project preparation.

Monitoring & Evaluation

56. Annex 1 provides the M&E framework of this project, which includes (a) environmental monitoring to verify the values of results indicators (i.e. pollution load reduction); (b) independent verification of outputs delivered under Component 1; (c) independent verification of achievements of agreed performance targets at various milestones under Component 2; and (d) project management related M&E activities. For (a), a professional team will be hired to conduct qualitative environmental monitoring studies to provide a more complete and holistic understanding of the impact of the project on agricultural pollution reduction. Results of project supported environmental monitoring results will be shared with DEP to ensure that project financed monitoring data could be fed into DEP's existing water quality monitoring information system. For (b) and (c), these M&E activities are crucial for disbursement activities and will be carried out by county PMUs with support from the PMO. The PMO will carry out (d) with support from municipal and county PMUs. It will also report the project implementation status based on this results framework on a quarterly basis.

Annex 4: Operational Risk Assessment Framework (ORAF)

China: Guangdong Agricultural Pollution Control (P127775)

Stage: Appraisal

1. Project Stakeholder Risks	Rating	Moderate		
Description : <ul style="list-style-type: none"> • Farmers may not follow technical details required by the project to carry out crop production activities due to their concerns of efficiency and complexity of project promoted technologies/practices. • Pig farms may be reluctant to invest in waste management facilities due to high costs and relatively weak enforcement. 	Risk Management: <ul style="list-style-type: none"> • Based on farmers' participation willingness and concerns identified under the SA, subsidies for farmer participation were developed. • Strong technical support by county and township extension services, and additional subsidy to villages/cooperatives with satisfactory performance are devised to incentivize most of farmers to adopt project recommended technologies and practices. • The project will target on large scale commercial farms that are under close supervision of DOA and DEP on their environmental performance. 			
	Resp: Bank/Client	Stage: Prep/Imp	Due Date :	Status: Ongoing
2. Implementing Agency Risks (including fiduciary)				
3.1. Capacity	Rating: Moderate			
Description : <ul style="list-style-type: none"> • County PMUs under Component 1 have no prior experience on Bank projects and have minimal understanding on Bank FM, procurement and safeguards procedures and policies. • Existing extension service centers at the county and township levels may not have sufficient technical capacity and human resources to provide technical support. 	Risk Management: <ul style="list-style-type: none"> • Training on Bank project management was provided to county PMUs during project preparation and will be provided during project implementation on a regular basis; • PMO and the Bank team provides necessary guidance to county PMUs on project management issues. • Capacity building activities will be carried out under Component 3 to strengthen technical capacity of extension service centers. • Additional agricultural experts and technicians will be recruited to guide general and specific technical issues. 			
	Resp: Bank/Client	Stage: Prep/Imp	Due Date :	Status: Ongoing
3.2. Governance	Rating: Moderate			
Description : <ul style="list-style-type: none"> • Project implementation involves distribution of a large amount of grant subsidies to a large number of project beneficiaries. Such subsidies may be misused for unintended purposes. 	Risk Management : <ul style="list-style-type: none"> • Loan proceeds and provincial counterpart funding will be managed directly by DOF, and distributed to project beneficiaries through the IC card system or various project implementation agreements. • Use of project funds will be audited as required by domestic and provincial policies and by the project. • The Bank team will closely monitor the use of project funds during implementation. 			
	Resp: Bank/Client	Stage: Prep/Impl	Due Date :	Status: Ongoing
4. Project Risks				

4.1. Design	Rating:	Substantial		
Description : <ul style="list-style-type: none"> Project proposed subsidy levels and modalities fail to attract participation of potential project beneficiaries or to change project beneficiaries' production behaviors. Complex and innovative types of payment schemes under Component 1 may delay fund disbursement and thus discourage project participation. 	Risk Management :			
	<ul style="list-style-type: none"> SA findings on willingness and demands of potential project beneficiaries are used to design project subsidy levels and modalities. These subsidies will be further reviewed and updated during project implementation based on actual results. Clearly defined subsidy levels and verification/disbursement procedures are included in the PIM. Such procedures will be further refined based on actual implementation results. 			
	Resp: Bank/Client	Stage: Prep/Impl	Due Date :	Status: Ongoing
4.2. Social & Environmental	Rating:	Low		
Description : <ul style="list-style-type: none"> Inexperienced county level PMUs may fail to properly monitor social safeguard issues and implement agreed mitigation measures. Project financed pig farms fail to achieve agreed environmental compliance during project implementation. 	Risk Management :			
	<ul style="list-style-type: none"> DOA has assigned a dedicated staff to coordinate safeguard related activities; manage training program on safeguard issues to strengthen capacity of county PMU, and engage safeguard consultants to provide assistance as needed. Guangdong and project financed pig farms are required to commit to agreed safeguards measures prior to be selected for project financing. Project supported independent M&E activities will ensure proper monitoring of safeguards compliance. The Bank's safeguards specialists will supervise the compliance and provide guidance during project implementation. 			
	Resp: Bank/Client	Stage: Implementation	Due Date :	Status: Ongoing
4.3. Delivery Monitoring & Sustainability	Rating:	Medium		
Description : <ul style="list-style-type: none"> Environmental impacts of project activities on pollution reduction may not be properly monitored and evaluated during and beyond project implementation. 	Risk Management :			
	<ul style="list-style-type: none"> A well-designed M&E system was developed during project preparation to properly monitor pollution reduction impacts of key investment activities. The M&E system is closely linked with the province's existing pollution reduction monitoring and verification system. 			
	Resp: Bank/Client	Stage: Prep/Impl	Due Date :	Status: Ongoing
5. Overall Implementation Risk: Substantial				
Comments: Project implementation risk is rated substantial due to above-noted risks on project financing arrangements. In addition to above noted mitigation measures, the Bank will perform intensive implementation support through periodic and <i>ad hoc</i> missions to support Guangdong to properly manage these risks during project implementation.				

Annex 5: Implementation Support Plan
China: Guangdong Agricultural Pollution Control (P127775)

Strategy and Approach for Implementation Support

1. In preparing the implementation support plan (ISP), the task team took into account the technical and innovative aspects of the project including its risk profile. The project's risk categories were rated low or moderate resulting in an overall implementation risk rating of moderate.
2. Implementation support will focus on:
 - a. Technical – Experts on livestock waste management and conservation agriculture will be part of the Bank implementation support team and will participate in the supervision missions. The introduction of new and innovative technologies will require close follow up and monitoring by the LWM and CA experts. They will be available to provide advice to the beneficiaries, and at the same time assess and evaluate progress and respond/resolve any technical issues impeding implementation.
 - b. Safeguards. Aside from the standard monitoring and evaluation of the project's progress, an M&E system will also be put in place to monitor the implementation of the safeguards instruments. Several safeguards policies are triggered under the project and instruments have been prepared to address and mitigate the risks. The environmental and social safeguards team specialists will be an integral part of the implementation support to ensure compliance with the Bank's safeguards requirements.
 - c. Financial/Procurement. The implementing agencies have limited experience in working with Bank projects and are unfamiliar with the Bank's guidelines as they relate to financial management and procurement. Training will be provided to staff, and qualified staff will be hired to undertake these responsibilities under the project. The Bank's FM and Procurement specialist will be available for consultation, advice and guidance and will conduct periodic reviews to ensure compliance with the Bank's fiduciary requirements.

Implementation Support Plan

3. The first two years of project implementation will be critical to the project's success so more intensive supervision will be required during that time. During the first two years of implementation, the project will be initiating CA pilots. Critical support and guidance will be

required to ensure that the pilots are implemented as planned to ensure success and scale-up in subsequent years.

4. A number of key staff in the project team are based in the Beijing office and will be able to provide timely and efficient implementation support to the client. In addition, the Bank team will conduct semi-annual supervision missions, including field visits, to review progress and to address and resolve any issues which may arise. The supervision team will be comprised of a combination of technical, environment, safeguards and fiduciary experts in order to be able to arrive at a holistic view of project progress.

Project Implementation Support Input Requirements

<i>Time</i>	<i>Focus</i>	<i>Skills Needed</i>	<i>Resource Estimate</i>
<i>First twelve months</i>	Team and task leadership	Task team leaders	4 SW and 3 trips /staff
	CA pilots	CA experts	4 SW and 2 trips /expert
	LWM investments	LWM expert	4 SW and 2 trips
	FM & Procurement	FM & Procurement Specialists	4 SW and 2 trips /staff
	Safeguards	Safeguards Specialists	4 SW and 2 trips /staff
<i>12-48 months</i>	Team and task leadership	Task Team Leaders	3 SW and 2 trips /staff/year
	CA pilots	CA experts	3 SW and 2 trips /expert/year
	LWM investments	LWM expert	4 SW and 2 trips /year
	FM & Procurement	FM & Procurement Specialists	2 SW and 1 trips /staff/year
	Safeguards	Safeguards Specialists	2 SW and 1 trips /staff/year

Skills Mix Required

<i>Skills Needed</i>	<i>Number of Staff Weeks</i>	<i>Number of Trips</i>	<i>Comments</i>
Task Team Leader	3 SWs during the first year and 3 SWs annually in the following years	2 / year	International staff (Washington based)
Co-Task Team Leader	5 SWs during the first year and 3 SWs annually in the following years	6 for the first year and 4 for the following years	National Staff (Beijing based)
CA expert	4 SWs during the first year and 2 SWs annually in the following years	2 /year	International expert (Rome based)
LWM expert	4 SWs	2 /year	International expert (DC based)
Environmental safeguards specialist	4 SWs during the first year and 2 SWs annually in the following years	Field trips as required	Country office based
Social safeguards specialist	4 SWs during the first year and 2 SWs annually in the following years	Field trips as required	Country office based
FM specialist	4 SWs during the first year and 2 SWs annually in the following years	Field trips as required	Country office based
Procurement specialist	4 SWs during the first year and 2 SWs annually in the following years	Field trips as required	Country office based