



PROJECT IDENTIFICATION FORM (PIF)¹

PROJECT TYPE: Full-sized Project
THE GEF TRUST FUND

Submission Date: October 31, 2007

Re-submission Date: 11/01/2007

PART I: PROJECT IDENTIFICATION

GEFSEC PROJECT ID²: 3223

GEF AGENCY PROJECT ID: P090376

COUNTRY(IES): China

PROJECT TITLE: Shanghai Agricultural and Non-point
Pollution Reduction (SANPR) project

GEF AGENCY(IES): World Bank

OTHER EXECUTING PARTNERS: N/A

GEF FOCAL AREAS: International Waters

GEF-4 STRATEGIC PROGRAM(S): IW-SP 2

NAME OF PARENT PROGRAM / UMBRELLA PROJECT: GEF/WB Strategic Partnership Investment Fund for
Pollution Reduction in the Large Marine Ecosystems of East Asia.

INDICATIVE CALENDAR	
Milestones	Expected Dates
Work Program (for FSP)	N/A; under IF
CEO Endorsement/Approval	June 2008
GEF Agency Approval	July 2008
Implementation Start	October 2008
Mid-term Review (if planned)	February 2010
Implementation Completion	December 2011

A. PROJECT FRAMEWORK (Expand table as necessary)

Project Objective: To demonstrate effective and innovative pollution reduction activities in Shanghai's rural areas in order to reduce the rural/agricultural pollution load (especially nutrients) to the East China Sea.								
Project Components	Indicate whether investment, TA, or STA**	Expected Outcomes	Expected Outputs	Indicative GEF Financing*		Indicative Co-financing*		Total (\$ m)
				(\$ m)	%	(\$ m)	%	
1. GREEN FIELD SITES - CHONGMING ISLAND Component 1: Domestic Animal Waste (DAW) Treatment in Chongming	Both investment and TA	(a) DAW converted to organic fertilizer (t) / pollution reduced*** (tons BOD, N and P); significant quantity of soil rehabilitated (ha); sustainable agriculture methods demonstrated (b) benefits of separation of livestock from human habitation demonstrated.	(a) organic fertilizer processing pilots established; (b) dedicated animal production zone established	0.50	8	5.60	92	6.10
Component 2: Eco-Agricultural Waste Use Demonstration, Qianwei Village	Both investment and TA	Increased public outreach, awareness, and education; rural waste beneficially utilized / pollution reduced (tons of BOD, N and P)	Improved, modernized, expanded eco-village	0.75	18	3.35	82	4.10

¹ PIF submission is limited to 4 pages only.

² Project ID number will be assigned initially by GEFSEC.

Component 3: Artificial Wetland Sewage Treatment in Chenjiazhen	Both investment and TA	New technology successfully demonstrated (tons of BOD, N and P pollution reduced); wetland successfully preserved and managed	(a) decentralized artificial wetland sewage treatment system in place; (b) management plan established and resources dedicated for natural wetland	0.85	24	2.75	76	3.60
2. BROWN FIELD SITES: UPPER HUANGPU AREA Component 4: Dairy Farm Waste Treatment	Both investment and TA	Decreased pollution from dairy farms (tons of BOD, N and P to aquatic environment); new technology demonstrated and adopted	(a) increased capacity for farm relocation; (b) pilot bio-fermentation waste treatment plant in place	0.85	11	7.00	89	7.85
Component 5: Replication of Environmentally Friendly Modern Agricultural Pollution Control Techniques	Both investment and TA	Innovative technologies and methods that contribute to pollution reduction adopted broadly; pollution reduced (tons of BOD, N and P to aquatic environment)	(a) innovative technologies implemented (b) environmentally friendly agricultural zone established; (c) garden type treatment system established	0.85	11	6.97	89	7.82
Component 6: Strengthening Rural Area Environmental Protection Dissemination and Training	TA	Results of project activities replicated and a District Financing Vehicle (DFV) type mechanism proved to be an effective institutional tool for agricultural pollution reduction.	(a) target groups possess newly acquired capacity to disseminate and replicate activities demonstrated in C1 – C5 (b) international conference successfully carried out	0.99	91	0.10	9	1.09
7. Project management				0	0	1.10	100	1.10
Total Project Costs				4.79	15	26.87	85	31.66

* List the \$ by project components. The percentage is the share of GEF and Co-financing respectively to the total amount for the component.

** TA = Technical Assistance; STA = Scientific & technical analysis.

*** pollution amounts to be determined during preparation

B. INDICATIVE FINANCING PLAN SUMMARY FOR THE PROJECT (\$ M)

	Project Preparation	Project	Agency Fee³	Total
GEF Grant	0.212	4.788		5.00
Co-financing	0.080	26.870		26.95
Total	0.292	31.658		31.95

³ Agency Fee received at the time Trance A of the Investment Fund for Pollution Reduction in the Large Marine Ecosystems of East Asia was approved by the Council.

* Please include the previously approved PDFs and planned request for new PPG, if any. Indicate the amount already approved as footnote here and if the GEF funding is from GEF-3.

Please note that both the PPG and Project amount (total US\$ 5 M) were approved by GEF Council in the June 2007 Meeting as part of the Strategic Partnership Investment Fund, Tranche 1b.

C. INDICATIVE CO-FINANCING FOR THE PROJECT (including project preparation amount) BY SOURCE AND BY NAME (IN PARENTHESES), IF AVAILABLE (\$ M)

Sources of Co-financing	Type of Co-financing	Amount
Project Government Contribution	Cash	26.87
Project Government Contribution	Kind	0.08
Total co-financing		26.95

PART II: PROJECT JUSTIFICATION

A. STATE THE ISSUE, HOW THE PROJECT SEEKS TO SOLVE IT, AND THE EXPECTED GLOBAL ENVIRONMENTAL BENEFITS TO BE DELIVERED:

Shanghai Municipality is one of four provincial-level cities in China, with more than 18 million residents. Of its total area of 6,300 sq km, only 10%, or 630 sq km, constitutes the core city; eight rural/suburban districts and one county (Chongming Island) cover the remaining 90%. The rural areas account for some 60-70% of the loads of nitrogen, phosphorus, and organic matter discharged to watercourses, largely from the agriculture/livestock sector. In the area adjacent to the Changjiang (Yangtze) River estuary and Hangzhou Bay, in the East China Sea, hypoxia is a serious problem, and polluted agricultural run-off, and untreated industrial and domestic wastewater discharges, are major sources of pollution.⁴ Since the 1980s, the use of chemical fertilizers has greatly increased and the run-off of these substances into the aquatic environment has caused eutrophication to be ubiquitous. The nutrient loading to the marine environment through freshwater inflow has resulted in an increased frequency of harmful algal blooms (HABs) in the East China Sea. In 2003, there were 86 HABs with a total area of up to 12,990 sq km. These blooms had a measurable impact on fish stocks and other ecosystem services. The water quality in the Huangpu River (discharging to the East China Sea), the main source of drinking water for the municipality, has become increasingly polluted over the past ten years, now rendering it marginally acceptable as a source of drinking water.⁵

Shanghai Municipal Government (SMG) recognizes the need to address the water pollution issues in order to achieve its objective of becoming a world-class economic and trade center. An ambitious overall program was launched in 2003, supported by the first IBRD adaptable program loan (APL) to China of US\$700 million, supporting a US\$1.5 billion investment program (Shanghai Urban Environment Project-APL), with the objective of improving environmental conditions in the Greater Shanghai Municipality by progressive development and implementation of integrated, metropolitan-wide environmental management measures. Under the ongoing APL2, Shanghai is pursuing innovative ways of extending such measures to its less affluent, growing districts outside the core city (home to about 50% of the population), in particular for sanitation (wastewater) and solid waste management. The government is also making significant strides in changing the role of government from a provider of services to more of an enabler and facilitator.

⁴ Information derived from UNEP / GEF / Kalmar Global International Waters Assessment (GIWA) the East China Sea.

⁵ Shanghai is with APL support constructing a new water intake system on Zhangtze river, potentially to function in a conjunctive mode with the existing Huangpu river intake.

While Shanghai has undertaken (and is undertaking) many critical environmental improvement projects, with and beyond IBRD support, these have mostly focused on urgent municipal and industrial wastewater needs. As a result, rural non-point pollution has now become the priority pollution problem for the Shanghai water environment.

The rural/suburban districts of Shanghai face much greater obstacles than the core city in raising stable, long-term financing for environmental infrastructure investment, and have less experience in environmental management. In order to use Shanghai's strength to help these outlying districts undertake key environmental investments, Shanghai established a demand-driven District Financing Vehicle (DFV) in 2005 to assist these districts with project management and finance mobilization. In the complex sub-national institutional environment in China, this mechanism is a major organizational breakthrough, which to date has proved successful. It is expected that this initiative will be replicated in other municipalities across China. Additional institutional and policy advances under the APL to date include revised regulations for agricultural wastewater pollution control, strengthened capacity of the Shanghai Water Authority for municipal-wide planning, and a Upper Huangpu Catchment Management Plan, all reflected in triggers for APL2 and APL3. The DFV is being implemented through the Shanghai Chengtou Environmental Asset Management Co. Ltd. (CEAM), initially with a US\$30 million IBRD contribution under APL2, and another US\$30 million IBRD support has been requested under the APL3, currently under preparation. The DFV-supported sub-projects under APL2 and APL3 have focused on improved sewerage systems, wastewater treatment, and solid waste management in towns in the suburban districts/county, largely because the technology for non-point solutions has not been demonstrated. With its metropolitan-wide coverage, however, it is anticipated that CEAM in future years could also support non-point pollution projects, based on requests from suburban districts.

The GEF project would build on the DFV experience to implement a number of environmental protection demonstration activities in Shanghai's outer districts, to address agricultural and non-point pollution problems, and provide quick results that could be used to influence future funding from IBRD and replication throughout coastal China. The dissemination and replication of these activities on a large scale in future phases of the APL, would contribute to improved water quality in the East China Sea, a shared water body and large marine ecosystem. IBRD financing of US\$120 million remain uncommitted within the Shanghai APL program (approved by the Bank in 2003), for an APL Phase 4, which because of this catalytic project would be considered for further agricultural/non-point pollution investments as a follow-up to this GEF project.

The project components include:

1. GREEN FIELD SITES - CHONGMING ISLAND

Component 1: Domestic Animal Waste (DAW) Treatment in Chongming

- (a) support pilot projects that convert DAW into organic fertilizer, promote organic fertilizers to replace chemical fertilizers to gradually rehabilitate the soil, and develop more ecologically friendly and sustainable agriculture.
- (b) demonstrate a dedicated animal production zone isolated from human habitation.

Component 2: Eco-Agricultural Waste Use Demonstration, Qianwei Village

Expand and modernize the existing eco-demonstration facility at Qianwei Village, which has vast potential for public outreach. Create a modern eco-agricultural site with organic food production, comprehensive use of rural waste, methane gas production, and domestic sewage eco-treatment.

Component 3: Artificial Wetland Sewage Treatment in Chenjiazhen

- (a) construct a decentralized artificial wetland sewage treatment system.
- (b) establish a plan and dedicate resources to enhance and protect a natural wetland, and use it for educational purposes.

2. BROWN FIELD SITES: UPPER HUANGPU AREA

Component 4: Dairy Farm Waste Treatment

- (a) develop appropriate technical, institutional and managerial capacity for relocating dairy farms
- (b) implement a pilot bio-fermentation waste treatment plant, which is standardized, has low energy consumption, low cost, and low labor requirements.

Component 5: Replication of Environmentally Friendly Modern Agricultural Pollution Control Techniques

- (a) demonstrate innovative techniques to reduce the utilization of chemical fertilizers and pesticides, and promote organic fertilizers, accurate fertilizer application, safe chemical use, bio-pesticides, and non-chemical technologies. Disseminate information and establish a plant disease and insect pest early warning network.
- (b) establish an environmentally friendly agricultural zone to demonstrate low chemical fertilizers and pesticide use.
- (c) set up garden-type artificial wetland sewage treatment plant (domestic sewage treatment, community greening, and landscaping) for new residential quarters for farmers.

Component 6: Strengthening Rural Area Environmental Protection Dissemination and Training

- (a) disseminate experience from Activities 1-5 and provide training for technical replication to the public, local Shanghai farmers, schoolchildren, professionals from universities, research institutes, and to government extension departments in China and beyond in cooperation with PEMSEA.
- (b) international Technical Exchange and Dissemination Conference between experts from management departments in Shanghai and other coastal areas of China, with the aim of replicating the results in China and beyond.

B. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH NATIONAL PRIORITIES/PLANS

The current project fits within the Bank Group and China's Country Partnership Strategy (CPS), which states that, "better resource management is essential to sustainable development." The CPS states that the Bank Group will help to mainstream environmental concerns into the development process. "Taking steps to minimize water pollution..." and piloting and scaling up "policies and mechanisms to address agriculture non-point pollution..." are areas where Bank engagement can be usefully expanded.

The project comes under the WB/GEF Investment Fund for Pollution Reduction in the Large Marine Ecosystems of East Asia (the Fund), which is managed in cooperation with the GEF/UNDP Partnerships for Environmental Management of the Seas of East Asia (PEMSEA). PEMSEA is part of the regional implementation plan of the UN Environment Program Global Programme of Action (GPA) for the Protection of the Marine Environment from Land-based Activities. The objective of the Fund is to scale up investment to reduce land-based water pollution in coastal areas and major river basins in East Asia.

C. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH GEF STRATEGIES AND FIT WITH STRATEGIC PROGRAMS:

The Fund and the SANPR are consistent with GEF's Contaminant-Based Operational Program 10 (OP10), which aims to demonstrate ways of overcoming barriers to the adoption of best practices that limit contamination of International Waters. They are also consistent with GEF's current Strategic

Objective 2, “to catalyze transboundary actions addressing water concerns,” specifically to reduce land-based coastal pollution, and with Strategic Program 2, “reducing nutrient over-enrichment and oxygen depletion from land-based pollution of coastal waters in LMEs consistent with the GPA.” As noted above regarding hypoxia and eutrophication, the aquatic environment adjacent to Shanghai’s coastline is one of the main pollution hotspots in the East China Sea. The amount of nutrients reduced would be closely monitored in the areas of intervention.

D. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES:

The SANPR is part of a larger strategy, PEMSEA’s Sustainable Development Strategy of the Seas of East Asia, and is the first project under the Fund to address agricultural, and non-point pollution. As such it brings great value to the Fund and PEMSEA. The SANPR is incremental to the Shanghai Urban Environment APL, which aims at improving the environmental management within the Greater Shanghai Municipality, specifically in water quality, solid waste, and sanitation. It is closely related to the existing DFV program under APL2 and APL3, which is also focusing on outlying areas of the municipality. The SANPR originated in conjunction with the preparation of the APL2, when studies carried out under the APL determined that the principal source of water pollution after municipal wastewater was agricultural, and non-point pollution. It is therefore integral to the strategy of the APL, which to date has focused on more traditional municipal environmental problems.

E. DISCUSS THE VALUE-ADDED OF GEF INVOLVEMENT IN THE PROJECT DEMONSTRATED THROUGH INCREMENTAL REASONING

The GEF project will demonstrate innovative techniques in order to catalyze further investment for rural, agricultural and non-point pollution reduction, which can be carried out by the districts/county with support of the DFV or otherwise, as required, in conjunction with APL3 and/or in possible subsequent phases of the APL (phase IV).

Because of the difficulties in treating agricultural pollution in rural areas, and in spite of Shanghai’s efforts to control non-point pollution sources, there are capital and technical barriers to the pollution reduction. So far, there are very limited non-point pollution reduction projects in Shanghai addressing rural areas and agriculture, i.e. low cost, energy-efficient solutions that use wastes as resources, suitable as references and for replication. Agricultural entities have scarce resources and are self-financing, which accounts for limited progress on this subject to date, and as a result technical advances have been lagging. The Shanghai Municipal and District/County Governments have to date emphasized municipal (urban) and industrial pollution control and related investments. This to some extent also reflects policy and institutional weaknesses in addressing agricultural and non-point pollution. The proposed project is expected to have a significant catalytic effect on the above.

Under the baseline scenario, agricultural and non-point pollution in Shanghai would not be addressed, or would be addressed in a piecemeal, limited, and uncoordinated way. A coordinated approach towards addressing livestock and other rural area waste would be absent, and pollution loads to the East China Sea would increase. Water and soil quality would continue to deteriorate. Existing efforts to address pollution would be implemented only partly, and over a longer period, and would have limited likelihood of replication.

The Shanghai Urban Environment APL, supported by IBRD, is to date providing wastewater facilities, but mainly to the Shanghai city center and other urban areas (towns), and will have limited overall impact in the Municipality’s rural areas in the outlying districts. The existence of the District Financing Vehicle (DFV) in Shanghai, established under the APL in 2005, whose purpose is to utilize Shanghai’s existing project management, financial and technical capacity, which is high, to support projects in the

outlying districts, is SMG’s approach to strengthen pollution mitigation in the districts. However, the DFV activities are for the foreseeable future mostly oriented towards the towns in the outer districts. Without a dedicated commitment and catalytic contribution from a GEF-financed project, it is unlikely to be asked by the districts/county to address non-point pollution in any rural areas.

Thus the value-added of GEF involvement to undertake a demonstration program to test the use of a DFV type mechanism for agricultural pollution reduction is through increased investment that can play a catalytic role in the APL for replication, improved institutional coordination, and clear demonstration of innovative technologies that would otherwise not happen, or happen in a very limited way.

F. INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS, THAT MIGHT PREVENT THE PROJECT OBJECTIVE(S) FROM BEING ACHIEVED, AND IF POSSIBLE INCLUDING RISK MEASURES THAT WILL BE TAKEN

The SANPR is the product of a lengthy analytical and operational process, and is framed within a large Bank engagement (together, APL I, II and III add up to about US\$ 1.5 billion of investments). The project has a strong project implementation organization, with solid technical, analytical, safeguards, and financial skills, making the overall risk Modest. Nevertheless, the project faces the following potential risks, shown below with relevant mitigation measures:

Risk	Mitigation	Risk rating
Low uptake by farmers of techniques demonstrated	High emphasis on benefits of techniques demonstrated including health and economic benefits	M
Resistance to change if appropriate economic incentives are lacking	Economic benefits of innovations to be demonstrated as part of project	M
High cost of scaling up demonstration activities	Project will target most cost-effective technologies	M
Climate change (CC) risks (e.g. reduced rainfall, flood, drought, sea level rise)	Within project lifetime, CC is likely to be negligible	N
Overall risk rating		M

H - High, S - Substantial, M - Modest, N - Negligible

G. DESCRIBE, IF POSSIBLE, THE EXPECTED COST-EFFECTIVENESS OF THE PROJECT:

While specific studies on cost-effectiveness have not been carried out, recent technical studies undertaken under the Shanghai APL show that, after Shanghai’s many large and IBRD supported interventions in recent years on municipal and industrial wastewater, currently rural non-point pollution is the main pollution source of the Shanghai water environment i.e. rural non-point pollution is the next target in order of priority and cost efficiency. The SANPR chooses interventions that combine visibility with innovation, cost effectiveness, low labor, reuse of waste, and that have high potential for replication. During preparation, quantitative estimates of pollution reduced per unit of investment will be made for each project component, because agriculture pollution reduction would be expected to be more cost effective than further municipal and industrial wastewater treatment. This will create a basis for Shanghai to consider further similar and larger pollution reduction investments in a future APL IV project (see above).

H. JUSTIFY THE COMPARATIVE ADVANTAGE OF THE GEF AGENCY:

The Bank’s comparative advantage in this project is through the mobilization of local funds (amounting to about five times the GEF grant), and through direct investments and integration with the ongoing APL program (ongoing APL1 and APL2, APL3 under preparation, and a possible future APL4 project).

Existing capacity under the APL will be utilized to implement SANPR, both on the part of the Client (APL PMO in Shanghai Municipality) and the Bank (task team). The World Bank has the comparative advantage to mobilize the \$27 million in cofinancing needed for the project to succeed.

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINTS AND GEF AGENCIES

A. GEF AGENCY COMPARATIVE ADVANTAGE (leave blank if GEF Agency is within the [comparative advantage](#) matrix) *N/A*

B. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the [endorsement letter\(s\)](#) with this template).

Mr Jinkang Wu GEF Operational Focal Point in China International Department Ministry of Finance People’s Republic of China	Date: August 16, 2007
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C. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for project identification and preparation.	
 Steve Gorman WB GEF Executive Coordinator, The World Bank Group	Mahesh Sharma Project Contact Person
Date: October 31, 2007	Tel / Email: 1-202-458-7339, msharma1@worldbank.org