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ANNEX A: INCREMENTAL COST ANALYSIS

A. PROJECT BACKGROUND

DDT is still being used as booster biocide in antifouling paint in China. DDT based antifouling paint is mainly used by medium and small sized fishing ships for its immediate and strong antifouling effect and low price. PDF-B survey shows that China has 300,000 fishing ships widely distributed along its coast extending 18,000km, which will consume 10,000 MT antifouling paints every year, half of which is DDT based paint and the other half is organotin based antifouling paint. About 250 MT DDT will be used for production of DDT based antifouling paint per annum. As of 2002, the accumulative total of DDT used for this purpose since 1950s has reached 10,000 MT. During intergovernmental negotiations of the Stockholm Convention and after China signed the Convention, China has launched large scale campaigns to raise awareness of the public and the related industries on the harms of POPs, including DDT, and the Government's intention to phase out these POPs. Producer, dealers and some better-off end users of DDT based antifouling paint have actively switched to other alternatives, including TBT-based anifouling paint. As a result, From 2002 to 2005, DDT used for antifouling paint production has seen a decrease but still reached cumulative 1,000 MT as the bulk of end users, mainly fishermen, have to stick to the use of DDT based antifouling paint due to their limited affordability of other alternatives.

Coastal environmental quality monitoring from year 2000 to 2005 detected residues of DDT and its degradation derivatives DDD and DDE which are also persistent and toxic in sea water and sediments. The concentration of DDT in the sediments in some areas in the sea exceeded Class I or II standards of marine environment quality. The excess DDT concentrations in sediment and sea organisms is directly related to their extensive usage in DDT based antifouling paint. The use of DDT as pesticide in agriculture was banned 20 years ago. DDT residues on land, soil, and food have fallen to trace levels. Therefore, release of DDT from antifouling paint on fishing boats and ships can be considered a new and a main source of DDT found in marine environment.

DDT is listed in Annex B of Stockholm Convention. According to Article 3, Provision 1 of the Convention, the Parties shall limit the production and use of the chemicals listed in Annex B. The Acceptable purpose or specific exemption for the production and use of DDT are limited to disease vector control and intermediate for production of Dicofol. DDT as an additive in production of antifouling paint is not considered a permitted use. Meanwhile, according to Article 10 and 11 of the Convention, the parties shall encourage and develop activities to research, develop and monitor POPs and their alternatives as well as other potential POPs.

Orgnotine (mainly TBT) based antifouling paints are also widely used by fishing ships and commercial ships navigating within China's sea territory. TBT is a high efficiency and low price antifoulant. TBT is stable in environment and can also be biologically accumulated and enriched. Its harms to environment include acute death, chronic toxication, deformation, and imposex that can cause reproductive problems and population decline or extinction. TBT can also disrupt the endocrine system. It is regarded as one of the most toxic substances that are introduced into the sea, and much research indicates that TBT has caused significant harm to the marine environment and sea organisms.

Though TBT is not a pollutant to be addressed by POPs Convention, it is the subject of International Convention on the Control of Harmful Antifouling Systems on Ships (the IMO Convention). IMO adopted the Convention on October 5, 2001. The IMO Convention is aimed at reducing or eliminating the negative impacts to the marine environment and human health caused by harmful antifouling systems on ships. It also establishes a mechanism to prevent one harmful antifouling system from being replaced by another harmful antifouling system. Due to the lack of feasible alternatives, TBT is still widely used in China.

GEF Instrument states that GEF can provide support to other environmental treaties for which GEF is not the financial mechanism. TBT as a persistent toxic pollutant can be addressed by GEF projects according to the Operation Program 10 – Contaminant Based Operational Program in the focal area of International Waters. Based on the technologies, experience, and instruments obtained from DDT based antifouling paint phase out can be replicated to phase out TBT so as to support China to accede to the IMO Convention as a long-term mechanism to protect marine environment and international waters from pollution caused by harmful antifouling systems on ships.

Antifouling paints are developing towards non-toxic and environmental friendly direction. Biocide free antifouling technologies such as electrical macromolecule film, fluorine carbon resin coating, organic silicon resin, and bionic antifouling paint are being actively developed and tested. There is a good prospect of application of these technologies, but they need a long time to become commercialized in marketplace.

After PDF-B survey and analysis, 3 antifouling paint formations are selected for consideration to replace DDT/TBT antifouling paints.

a) Use other organic booster biocides that are accredited by international authorities to replace DDT/TBT.

b) Capsaicine or capsainoids is used as repellant to replace DDT.

c) Alkali silicate antifouling paint.

The first year of the project will be used to support the above technologies to overcome barriers to commercialization so that they can meet the requirements to replace DDT in a technically feasible, economically viable, and environmentally friendly way.

As a signatory party to Stockholm Convention, China is planning to use 10 years to phase out and eliminate DDT before 2014 according to Strategy for Phase out of POPs Pesticides in China. This project to phase out DDT usage in antifouling paint production will act as the first step to phase out and eliminate DDT production and use in China. Established legal and institutional framework, effective economic and policy instruments, improved technical capacity, and strengthened environmental awareness will continue to support the ensuing phase out and elimination actions after the completion of the project.

B. INCREMENTAL COST ASSESSMENT

Baseline

DDT based antifouling paint has been in use for more than 30 years in China. Though it is presently used to a much lesser extent than in the past, its consumption remains relatively stable among the target group – owners of fishing ships of medium to small sizes. This group is characterized by a relatively low level of education, environmental awareness and income. The fishermen tend to be resistant to change, especially where higher cost is involved. Under the prevailing situation, it is not foreseeable that their income will grow in the near future. All alternatives available in market, mostly copper based, are of higher price and their prices will keep rising with the market prices of copper in the near future. There is also debate on the environmental performance of these alternatives, and many scholars call for a cautious approach in selection of alternatives.

Without the support of this GEF project, the fishermen will continue using DDT based antifouling paint, unless alternatives having better antifouling effects, sound environmental performance, and lower cost are made available in the marketplace. Due to lack of specific legal prohibition on use of DDT for production

of antifouling paint, manufacturers will continue exploit the market as long as demand exist. Even if such laws and regulations were formulated and promulgated, its implementation would face challenges or even be impeded by the very broad and sparse market against under-staffed enforcement forces. As a result, DDT will continue being released into marine environment, accumulated, transported and transformed in various environmental media, and will continue to cause damage to global environment and human health.

5,000 MT DDT based antifouling paint will cost 10 million USD per year if the unit price remains at around 2 USD per kilogram. 4 years' implementation will give rise to 40 million USD, which constitutes the direct baseline cost. The indirect baseline cost may be caused by the medical treatment of people exposed and the environmental treatment of contaminated sites. The indirect baseline cost is estimated to far exceed the direct baseline cost.

China still uses about 20,000 MT TBT based antifouling paints. Without this project, the lack of feasible alternatives and the barriers to commercialize alternatives will remain. The environmental problems caused by TBT antifouling paints will become more significant than today.

Global Environmental Objective

The binding objective of this project is to reduce production of 250 MT DDT per annum used for production of DDT based antifouling paints by converting to technically feasible, economically viable, and environmentally friendly alternatives.

The prospective objective of this project is to establish a long-term mechanism to protect the marine environment from pollution of harmful antifouling systems by supporting China to sign International Convention on the Control of Harmful Antifouling Systems on Ships (the IMO Convention) based on the technologies, experience and instruments obtained from phase out of DDT antifouling paint.

Alternative

The GEF alternative very likely provides the only possibility that very promising and already available alternative technologies to DDT/TBT based antifouling paints can be sustainably deployed. With the GEF project, already available technologies will be catalyzed to provide environmentally friendly alternatives that will be promoted for rapid commercialization. Demonstrational enterprises will be selected to produce these alternatives toward phase out of DDT based antifouling paint.

Cost of production of alternatives constitutes the majority of the co-finance of the project, and GEF financial support will be mainly used to overcome the barriers to rapid commercialization of these alternatives. The Executive Agency of the project, FECO/SEPA has successfully leveraged 8.5 million USD in-kind co-financing from the private sector. The central government will provide 3.75 million USD as co-financing in cash to establish a safeguarding policy environment and improve the institutional capacity. Some bilateral sources such as foreign governments and enterprises have expressed strong interests in providing co-financing.

The experience of phase out of DDT based antifouling paint under this project will create favorable conditions to accelerate the phase out of TBT based antifouling paint, and to support China to accede to the IMO Convention and implement the obligations. The promoted competitive alternatives will continue to take over the TBT antifouling paint market. The marine environment and international waters will be thus better protected.

Summary of Costs

Incremental Cost Matrix

Cost/Benefit	Baseline (B)	Alternative (A)	Increment (A-B)
Domestic Benefits	Fishermen will continue to use high efficiency and low price DDT based antifouling paint, causing DDT pollution to local coastal waters and sea organisms and economic loss. Health loss or threats will also impact the producers and users due to occupational exposure to DDT and DDT based antifouling paints.	High efficiency and environmentally friendly alternatives will be used on medium and small sized fishing boats to reduce DDT release into the sea and improve quality of marine environment. Occupational exposure of DDT will be reduced to safeguard occupational health.	Barriers to commercialization of these sustainable alternatives will be removed.
Global Benefits	Harms of DDT will be spread to the whole globe and impact the health of the whole human beings through long-distance transportation, transformation, and accumulation.	Harms of DDT that will be spread to the whole globe and impact the health of the whole human beings through long-distance transportation, transformation, and accumulation will be reduced.	
Outcome 1: Institutions and mechanism for project management and coordination	Only the CIO will pay part of its attention to DDT usage in production of antifouling paint under the framework of Strategy for Phase out of POPs Pesticides in China. No special institutional settings will be established for the challenging phase out of DDT usage. The baseline cost for this outcome will be 560,000 USD.	*Activity 1 Establish project management institutions and build their operational capacity.* *Act. 1.1* Establish project management institutions and coordination mechanisms based on the existing institutional settings. *Act. 1.2* Establish a national expert team to provide technical and consulting supports to project implementation. *Act. 1.3* Conduct trainings to improve managerial and technical capabilities for project management. *Act. 1.4* Conduct study tour abroad to learn advanced experience and technologies.	Most activities in the alternative scenario will be incremental, and will need an incremental cost of 1,090,000 USD.
Outcome 2: Management information system (MIS) and information management	General and sparse information was collected and stored during development of Strategy for Phase out of POPs Pesticides in China into the Sino-Italian MIS. Data and information on TBT will be collected. The baseline cost will be 200,000 USD.	*Activity 2 Establish an MIS and website* *Act. 2.1* Establish an MIS for the project. *Act. 2.2* Establish a mechanism for data collection and processing, information transmission and sharing. *Act. 2.3* Establish a website to disseminate project information to the public.	All activities in the alternative scenario will be incremental, and need a cost of 700,000 USD.

Cost/Benefit	Baseline (B)	Alternative (A)	Increment (A-B)
Outcome 3: Enabling policy environment	No special regulations and standards regarding the limit on DDT use will be established or revised. Some general standards and methods may be modified to address TBT in response to the IMO Convention, and this will involve a baseline cost of 790,000 USD.	*Activity 3 Establish or revise regulations, standards, and action plan supported by capacity building to create an enabling policy environment for phase out of DDT based antifouling paint and promotion of sustainable alternatives.* *Act. 3.1* Establish or revise related regulations, standards, and rules. *Act. 3.2* Revise compulsory rules of inspection of ship products. *Act. 3.3* Establish and promote a voluntary certification and labeling program in antifouling paint sector. *Act. 3.4* Sustain DDT phase out by reducing potential risk of TBT use in antifouling paint. *Act. 3.5* Strengthen the capacity of related departments to effectively implement and enforce regulations, standards and action plan.	Most activities will not occur or only occur to a minimal extent if without this project. The incremental cost will involve 700,000 USD.
Outcome 4: Conversion from DDT/TBT based antifouling paints to alternatives	The conversion from DDT/TBT based antifouling paints will not be possible to take place in the short and medium term in the baseline scenario, and already technically available alternatives cannot be commercialized spontaneously. But costs associated with the production, use and disposal of DDT antifouling paints should constitute the baseline cost at 10.5 million USD.	*Activity 4 Adopt multiple means of technological support, policy induction, market regulation, and awareness raising and education to promote the conversion from DDT/TBT based antifouling paints to alternatives.* *Act. 4.1* Test, select and acquire alternative technologies. *Act. 4.2* Select demonstration enterprises. *Act. 4.3* Produce, distribute and promote alternatives. *Act. 4.4* Conduct environmental sound management of DDT at contaminated sites and on the equipment.	The incremental cost will be the expense spent to remove the barriers to commercialization of the sustainable alternatives by adopting the multiple means in the alternative scenario, which is estimated to be about 6.8 million USD.

Cost/Benefit	Baseline (B)	Alternative (A)	Increment (A-B)
Outcome 5: Environmental education and awareness raising	Producers, dealers, users and disposal staff will only have very limited awareness of the harm of DDT based antifouling paint on the environment and their own health. The local authorities will not pay due attention to the problem. The CIO may allocate a small amount of resources to raise awareness for this DDT use from other DDT or POPs phase out projects. The baseline cost is estimated to be 200,000 USD.	*Activity 5 Conduct education to promote environmental awareness of the key stakeholders and the general public, improve their understanding of the harm of DDT/TBT based antifouling paints and the benefits of alternatives.* *Act. 5.1* Prepare publicity materials to conduct environmental education and awareness raising purpose targeting government officials, personnel in the industrial field and the general public through multiple media of TV, radio, newspaper, magazine, journal, Internet, CD-ROM, and printing materials. *Act. 5.2* Mobilize NGOs to conduct community based environmental education and awareness raising.	Most of the activities in the alternative scenario will be incremental and need a cost of 1.8 million USD.
Outcome 6: Monitoring and evaluation	No monitoring and evaluation will be involved if without this project. Thus, the baseline cost is zero.	*Activity 6 Effective monitoring and evaluation activities on project implementation and achievement of results.* *Act. 6.1* Conduct meetings for project inception, review progress and project results. *Act. 6.2* Launch field investigations and inspections to monitor and evaluate progress of project implementation. *Act. 6.3* Prepare various progress reports to monitor project progress and performance. *Act. 6.4* Conduct annual project audit.	All the cost occurred for this Outcome will be incremental cost, at a cost of 520,000 USD.
Total Cost	**USD 12,250,000**	**USD 23,860,000**	**USD 11,610,000**

ANNEX B: PROJECT LOGICAL FRAMEWORK

Project Strategy	Objectively verifiable indicators		
Goal	DDT based antifouling paint is to be substituted by technically feasible, economically viable, and environmentally friendly alternatives so as to help China fulfill the obligations under Stockholm Convention to control the use of DDT and protect the environment and human health.		
	Objectively Verifiable Indicators	**Sources of Verification**	**Assumptions and Risks**
Objective *Binding objective:* Use of 250 MT DDT per year in the production of DDT based antifouling paints will be stopped. *Prospective objective:* A long-term mechanism is to be established to protect the marine environment from pollution of harmful antifouling systems by supporting China to sign International Convention on the Control of Harmful Antifouling Systems on Ships (the IMO Convention), based on the technologies, experience and instruments gained from the phase out of DDT based antifouling paint.	➢ Annual production of 250 MT DDT used as additives will be reduced at Tianjin Chemical Plant. ➢ Zero DDT should be detected in antifouling paint. ➢ Residual or enrichment of DDT in the marine environmental media and sea organisms will be found to decrease. ➢ Alternatives which are technically feasible, economically competitive, and environmentally friendly will be developed, produced and distributed. ➢ Barriers to commercialize the alternatives will be removed. ➢ Laws, regulations and standards will be revised or established. ➢ Experience in phasing out DDT antifouling paint will be replicated to phase out organotin based antifouling paints. ➢ Concentration of organotin in the marine media will be reduced.	➢ Tender documents to request for proposals of procurement of technical service and capital equipment. ➢ TORs for recruiting consulting services. ➢ Work plans. ➢ Revised or newly promulgated laws, regulations and standards. ➢ Thematic study reports. ➢ M & E reports.	➢ Phase out and substitution actions will be supported by the nation, society and sector. ➢ Barriers can be effectively removed with necessary support of the project. ➢ Alternatives production can become financially sustainable after the completion of the project. ➢ Implementation and enforcement of policy and management mechanisms can continue to work effectively after the completion of the project.

Outcome 1 Institutions and mechanism for project management and coordination ***Activity 1 Establish project management institutions and build operational capacity.*** *Act. 1.1* Establish project management institutions and coordination mechanisms. *Act. 1.2* Establish a national expert team to provide technical and consulting supports to project implementation. *Act. 1.3* Conduct trainings to improve managerial and technical capabilities for project implementation. *Act. 1.4* Conduct study tour abroad.	➢ A cross sectoral Steering Committee will be established at the national and local levels. ➢ A cross sectoral project team will be established at the national level for daily project management and coordination. ➢ 3 local Project Management Offices (PMOs) will be established drawing upon resources from related departments. ➢ CTA, NTA and other consultants recruited. ➢ Government research agencies or private consulting firms will be selected to provide technical and consulting services. ➢ Materials for technical and management training will be compiled. ➢ Plan for study tour abroad will be developed and mission report will be drafted and share to build capacity.	➢ Name list of Steering Committee. ➢ Agendas and minutes of Steering Committee meetings. ➢ Name list of the national project team, responsibility defined and work reports. ➢ Name list of the local PMOs, responsibility defined, work plan finalized and work reports. ➢ TORs for CTA, NTA and other consultants. ➢ Training materials for technical and management training. ➢ Work plan for study tour abroad.	➢ Smooth coordination and sound cooperation can be achieved among sectors and between central and local levels. ➢ Various stakeholders can reach consensus and recognition of the project objectives and activities. ➢ Qualified CTA, NTA and other consultants can be recruited and fielded in time. ➢ Trainees can be well organized and mobilized. ➢ Countries with advanced technologies and experience are cooperative to host the study tour and share information.
Outcome 2 Management information system (MIS) and information management ***Activity 2 Establish an MIS and website for the project*** *Act. 2.1* Establish an MIS. *Act. 2.2* Establish a mechanism for effective information transmission and sharing. *Act. 2.3* Establish a website to disseminate project information to the public.	➢ A comprehensive evaluation will be conducted on the management information systems of the departments of fishing boat inspection, commercial ship inspection, and hazardous chemicals management, and marine environment management. ➢ Needs of data and information, software and hardware to implement this project will be assessed. ➢ Data exchange protocol will be developed to support information collection, processing	➢ An on-line operational project MIS. ➢ An on-line operational project website. ➢ Documentation series for MIS development.	➢ The needed data can be made available. ➢ The hardware and software configuration of the MIS for Sino-Italian Cooperation Project on Pesticidal POPs can be extended to accommodate the MIS for this project.

	and transmission among sectors and between central and local PMOs. ➢ Database and base model will be developed to collect and process technical, socio-economic, and environmental data in MIS. ➢ A project website will be developed, maintained and promoted.		
Outcome 3 Enabling policy environment ***Activity 3 Establish or revise regulations, standards, and action plan supported by capacity building to create an enabling policy environment for phase out of DDT based antifouling paint and promotion of sustainable alternatives.*** *Act. 3.1* Establish or revise related regulations, standards, and rules. *Act. 3.2* Revise compulsory rules of inspection of ship products *Act. 3.3* Establish and promote a voluntary certification and labeling program in the antifouling paint sector. *Act. 3.4* Sustain DDT phase out by reducing the potential risk of TBT use in antifouling paint. *Act. 3.5* Strengthen capacity of related departments to effectively implement and enforce regulations and standards.	➢ General Specification for Antifouling Paint on Ship Bottom will be revised taking into account environmental indicators. ➢ Method to Detect DDT Content in Antifouling Paint and Paint Film will be developed. ➢ Regulation to Ban DDT Usage for Antifouling Production Paint and Prohibit Ships to Use DDT Based Antifouling Paint will be drafted and made into effect. ➢ Rule for Inspection of Ship Products and Rule for Inspection of Fishing Boat Products will be revised. ➢ Rule for Voluntary Certification and Labeling of Antifouling Paints will be developed. ➢ Dossier for China to accede to the IMO Convention will be prepared. ➢ Action Plan for China to Implement the IMO Convention will be developed. ➢ Capacity of various departments will be strengthened.	➢ Revised General Specification for Antifouling Paint on Ship Bottom. ➢ Method to Detect DDT Content in Antifouling Paint and Paint Film. ➢ Regulation to Ban DDT Usage for Antifouling Production Paint and Prohibit Ships to Use DDT Based Antifouling Paint. ➢ Rule for Inspection of Ship Products and Rule for Inspection of Fishing Boat Products. ➢ A Voluntary Certification and Labeling Program for Antifouling Paints. ➢ Dossier for China to accede to the IMO Convention. ➢ Action Plan for China to Implement the IMO Convention.	➢ Regulations, standards, and policies can be approved and made into effects by related administrative departments. ➢ Voluntary certification and labeling program can exert complementary functions with compulsory inspection rules to promote the alternatives. ➢ Active cooperation and smooth coordination can be achieved among different departments.

Outcome 4 Conversion from DDT based antifouling paints to alternatives. ***Activity 4 Adopt multiple means of technological support, policy induction, market regulation, and awareness raising and education to promote the conversion from DDT/TBT based antifouling paints to alternatives.*** *Act. 4.1* Test, select and acquire alternative technologies. *Act. 4.2* Select demonstration enterprises. *Act. 4.3* Produce, distribute and promote alternatives. *Act. 4.4* Conduct environmental sound management of DDT at contaminated sites and on equipment.	➢ R & D institutes able to synthesize alternative biocides, active chilly ingredients, or other environmentally friendly antifoulants that will be selected. ➢ Applied researches will be conducted to promote the maturity of the alternative technologies for use by the project. ➢ On-ship coating experiment and scale-up production experiment will be conducted. ➢ Alternatives will prove to be technically feasible, environmentally friendly and can be produced at scale of economy. ➢ Antifouling paint manufacturers having strong technical and managerial competence and sound business plan will be selected. ➢ Feasibility study and EIA will be conducted according to related construction project approval procedures in China. ➢ Full scale production of alternatives will be started. ➢ Handbook to apply alternatives will be compiled and distributed. ➢ Incentives will be provided to mass production and purchase. ➢ Part of DDT production equipment will be closed and disposed at Tianjin Chemical Plant.	➢ Dossier of request for proposal and bidding proposals. ➢ Technologies for synthesizing alternative biocides, active chilly ingredients, or other environmentally friendly antifoulants. ➢ Technologies for full scale production of alternative antifouling paints. ➢ Feasibility study reports and EIA reports. ➢ Approval documents from Government ➢ Certificates and labels granted to enterprises. ➢ Enterprise records of production and sale. ➢ Handbooks to apply alternatives. ➢ Feasibility study reports on disposal of DDT based antifouling paint equipment and part of DDT production equipment.	➢ Results from applied research can be completed on time to be used by the project. ➢ Issues of intellectual property rights can be effectively addressed in time for existing alternative technologies or products that can be promoted by this project. ➢ Application and EIA reports for alternative production projects can be approved by authorities. ➢ Active cooperation among enterprises, dealers and users can be achieved. ➢ Alternative production industry can be commercialized after the completion of the project. ➢ Medium and small sized enterprises can be well supported and guided to produce alternatives and provide distribution and after-sale services.
Outcome 5 Environmental education and awareness raising	➢ A qualified director will be invited to direct a film.	➢ Film of DDT/TBT based antifouling paints and marine environmental	➢ Good quality publicity materials of various forms

Activity 5 Conduct environmental education to promote the environmental awareness of the key stakeholders and the public, improve their understanding of the harm of DDT/TBT based antifouling paints and the benefits of alternatives. *Act. 5.1* Prepare publicity materials for environmental education and awareness raising purpose targeting government officials, personnel in the industrial field and the public through multiple media of TV, radio, newspaper, magazine, journal, Internet, CD-ROM, and printing materials. *Act. 5.2* Mobilize NGOs to conduct community based environmental education and awareness raising.	➢ A TV special for marine environmental protection and antifouling systems will be made. ➢ Special programs will be made on local radio stations. ➢ A special column will be arranged in a professional journal. ➢ Contents introducing marine antifouling system will be added to the textbook for environmental education in local middle and primary schools. ➢ The project website will be regularly updated. ➢ 2 press conferences will be held for milestone events. ➢ Nation wide traveling exhibition will be launched to disseminate the project results. ➢ A fund raising activity will be organized for deformed children suffering from toxic antifouling paints. ➢ Joint exhibitions will be held with local marine exhibition halls. ➢ NGOs, universities and civil society will be mobilized to popularize knowledge about antifouling paints and raise their environmental awareness in community level. ➢ Focal points in communities and fishermen organizations will be established for long-term alternative promotion and environmental awareness raising.	protection. ➢ News reported on media. ➢ Materials for training of administrative staff of local government agencies. ➢ Materials for training of NGOs in universities and civil society. ➢ Focal points of the communities. ➢ Contents in middle and primary school textbooks introducing antifouling paints and marine environmental protection. ➢ Articles in special column of professional journal. ➢ Plan for joint exhibition with local marine exhibition halls. ➢ Work plan for nation wide exhibition.	and targeting various audiences can be produced in time. ➢ Active public participation.

	➢ Environmental education will be conducted systematically in local middle and primary schools. ➢ Training materials will be compiled and training workshops held for the local administrative staff from departments of economic trade, fishery, navigation, and environmental protection.		
Outcome 6 Monitoring and evaluation ***Activity 6 Effective monitoring and evaluation on project implementation and achieved results*** *Act. 6.1* Conduct regular meetings to review progress and project result review. *Act. 6.2* Launch field investigations and inspections to monitor and evaluate progress of project implementation. *Act. 6.3* Prepare progress reports for measurement of Means of Verification to monitor project purpose indicators, project progress and performance. *Act. 6.4* Conduct annual project audit.	➢ Inception meeting, annual steering committee meetings, annual project review meetings and tripartite project review meetings will be held. ➢ Special inspections on enforcement of regulations, rules, and standards will be launched. ➢ Independent mid-term and final project evaluations will be held. ➢ Memorandum or minutes of meeting for each field mission, annual progress and experience review reports, and the final project result and experience review reports will be prepared.	➢ Meeting minutes or memorandum. ➢ Annual project reviews. ➢ Final project review. ➢ Reports of independent project evaluation.	➢ Materials for monitoring and evaluation can be provided sufficiently in advance of the actual inspections, investigations, and various review meetings. ➢ The related staff at national and local levels for implementing the project can be available for making presentations assisting field investigations. ➢ There is open, transparent, and effective communication between the M & E staff and the project implementation staff.

ANNEX C: DETAILED PROJECT BUDGET

Project Title: Alternatives to DDT Usage in the Production of Antifouling Paint							
GEF Outcome / Atlas Activity*	**Activities**	**Source of Funds**	**Amount (USD) 2006**	**Amount (USD) 2008**	**Amount (USD) 2008**	**Amount (USD) 2009**	**Total (USD) All Years**
Outcome 1: Establish Project Management Institutions and Build Operational Capacity	Activity 1.1 Establish project management institutions and coordination mechanisms	GOC	150,000	150,000	100,000	50,000	450,000
		GEF	250,000	200,000	150,000	150,000	750,000
		Private Industry					
	Activity 1.2 Establish a national expert team	GOC	20,000	20,000	20,000	20,000	80,000
		GEF	80,000	60,000	40,000	40,000	220,000
		Private Industry					
	Activity 1.3 Conduct trainings	GOC	10,000	20,000			30,000
		GEF	20,000	20,000			40,000
		Private Industry					
	Activity 1.4 Conduct study tour abroad	GOC					
		GEF		80,000			80,000
		Private Industry					
	Sub-total		530,000	550,000	310,000	260,000	1,650,000
Outcome 2: Establish MIS and Website	Activity 2.1 Establish MIS and strengthen information support	GOC					
		GEF	10,000	30,000	20,000	10,000	70,000
		Private Industry					
	Activity 2.2 Data collection, analysis, transmission and sharing.	GOC	50,000	50,000	50,000	50,000	200,000
		GEF	100,000	200,000	200,000	100,000	600,000
		Private Industry					
	Activity 2.3 Establish a website	GOC					
		GEF	10,000	10,000	5,000	5,000	30,000
		Private Industry					
	Sub-total		170,000	290,000	275,000	165,000	900,000
Outcome 3:	Activity 3.1 Establish or revise related regulations, standards, and rules.	GOC	100,000	100,000			200,000
		GEF	100,000	100,000			200,000
		Private Industry					

Project Title: Alternatives to DDT Usage in the Production of Antifouling Paint							
GEF Outcome / Atlas Activity*	**Activities**	**Source of Funds**	**Amount (USD) 2006**	**Amount (USD) 2008**	**Amount (USD) 2008**	**Amount (USD) 2009**	**Total (USD) All Years**
Establish or Revise Regulations, Standards, and Action Plan	Activity 3.2 Revise compulsory rules of inspection of ship products.	GOC		20,000			20,000
		GEF		30,000			30,000
		Private Industry					
	Activity 3.3 Establish and promote a voluntary certification and labeling program	GOC		20,000			20,000
		GEF		20,000			20,000
		Private Industry					
	Activity 3.4 Sustain the results of DDT phase out	GOC	75,000	100,000	75,000	50,000	300,000
		GEF					
		Private Industry					
	Activity 3.5 Strengthen capacity and enforcement	GOC	50,000	75,000	75,000	50,000	250,000
		GEF	75,000	150,000	150,000	75,000	450,000
		Private Industry					
	Sub-total		400,000	615,000	300,000	175,000	1,490,000
Outcome 4; Adopt Multiple means of Technological Support, Policy Induction, Market Regulation, and Awareness Raising and Education to Promote Conversion	Activity 4.1 Test, select and acquire alternative technologies.	GOC	750,000	750,000			1,500,000
		GEF	1,750,000	1,250,000			3,000,000
		Private Industry					
	Activity 4.2 Select demonstration enterprises and business plan improvement	GOC					
		GEF	50,000	50,000			100,000
		Private Industry					
	Activity 4.3 Production and distribution of alternatives.	GOC					
		GEF		1,500,000	1,000,000	500,000	3,000,000
		Private Industry		3,200,000	3,200,000	2,100,000	8,500,000
	Activity 4.4 Conduct environmental sound management of DDT contaminated sites and equipment.	GOC		200,000	200,000	100,000	500,000
		GEF		400,000	200,000	100,000	700,000
		Private Industry					
	Sub-total		2,550,000	7,350,000	4,600,000	2,800,000	17,300,000
	Activity 5.1 Prepare	GOC	50,000	50,000	50,000	50,000	200,000

Project Title: Alternatives to DDT Usage in the Production of Antifouling Paint							
GEF Outcome / Atlas Activity*	**Activities**	**Source of Funds**	**Amount (USD) 2006**	**Amount (USD) 2008**	**Amount (USD) 2008**	**Amount (USD) 2009**	**Total (USD) All Years**
Outcome 5: Conduct Environmental Education to Promote Awareness	publicity materials to promote environmental education and awareness raising	GEF	300,000	300,000	200,000	200,000	1,000,000
		Private Industry					
	Activity 5.2 Mobilize NGOs to promote environmental education and awareness	GOC					
		GEF	200,000	200,000	200,000	200,000	800,000
		Private Industry					
	Sub-total		550,000	550,000	450,000	450,000	2,000,000
Outcome 6: Monitoring and Evaluation	Activity 6.1 Conduct meetings to review and monitor progress of project activities	GOC					
		GEF	50,000	80,000	60,000	50,000	240,000
		Private Industry					
	Activity 6.2 Launch field investigations and inspections to facilitate M&E	GOC					
		GEF	50,000	50,000	40,000	40,000	180,000
		Private Industry					
	Activity 6.3 Prepare progress and monitoring reports	GOC					
		GEF	20,000	20,000	20,000	20,000	80,000
		Private Industry					
	Activity 6.4 Conduct annual project audit	GOC					
		GEF		10,000		10,000	20,000
		Private Industry					
	Sub-total		120,000	160,000	120,000	120,000	520,000
Total Government of China Contribution			**1,255,000**	**1,555,000**	**570,000**	**370,000**	**3,750,000**
Total GEF Allocation			**3,065,000**	**4,760,000**	**2,285,000**	**1,500,000**	**11,610,000**
Total Private Industry Contribution			**0**	**3,200,000**	**3,200,000**	**2,100,000**	**8,500,000**
Total Budget excluding PDF-B approval			**4,320,000**	**9,515,000**	**6,055,000**	**3,970,000**	**23,860,000**
PDF-B GEF Resources							**295,000**
PDF-B Co-financing							**70,000**
Total Project budget including PDF-B approval							**24,225,000**

GOC = Government of China

ANNEX D: RESPONSE TO PROJECT REVIEWS

a) CONVENTION SECRETARIAT COMMENTS AND IA/EXA RESPONSE

None

b) STAP EXPERT REVIEW AND IA/EXA RESPONSE

Professor Paul K.S. Lam, Professor (Chair) of Biology
Department of Biology and Chemistry
City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong SAR
28 March 2006

1. General Overview
This project addresses an important area related to the ecological and human health risks associated with the environmental release and occurrence of DDT, particular in regards to its use as an additive in antifoulants. Not withstanding some apparently negative comments, there are many positive aspects in the proposal to which the reviewer offers his full support. The review opted to concentrate on areas that need attention, and, perhaps, improvement. Comments are intended to improve the proposal so that it will have an even greater impact. Overall, the reviewer supports his initiative.
Comment: no response necessary

2. Specific comments, observations and questions	
STAP Comments	**Responses to STAP Comments and Corresponding Changes in the Document**
Alternative technologies	
Comment 1) The proponents have done a throughout literature review on the available technologies for developing alternatives to DDT-based antifouling paints. It is proposed that three technologies are relevant in this context. However, it appears that the range of alternative technologies is limited and that there is still a lot of room for further development in this area. More research is clearly needed although it may not be part of the present proposal. A more detailed risk-benefit analysis on the various technologies (with relevant key references given) would be instructive, and should be included in the proposal to establish the feasibility and credibility of the proposed project	Besides literature review, extensive field surveys to R&D institutions were conducted during PDF-B phase to learn state-of-the-art technologies and development trend. Survey of available alternatives in the market was also carried out to investigate commercialization status. A special workshop of experts was organized to brainstorm on suitable alternatives for this project. An international survey by phone, e-mails, and teleconferences was also conducted to learn international experience in developing sustainable alternatives. Based on the results of these works, a thematic report on alternatives and analysis of their applicability was extensively reviewed and concluded with the selection in principle of three candidate alternative technologies. In the revised project document under Part V, Section IV (including Table nos. 6, and 7) and on Page 3 and 4, under Outcome 4 of the Executive Summary, only the important findings and conclusions are extracted to highlight the selection of these suitable and sustainable alternatives.
Comment 2) Linkage between DDT- and TBT-based antifouling paints is not clear in the proposal…. It should be noted that one possible outcome may be that fisherman will turn to TBT-based paint when DDT-based formulations are under stricter control or "eliminated" This scenario should be explored and covered in the proposal.	As China ratified the Stockholm Convention, it is legally binding for China to phase out DDT. Since China has not yet acceded to the IMO Convention, TBT antifouling system is not subject to control at the moment. It is anticipated that the experience and capacity built on eliminating DDT as additive in antifouling paint in this project will contribute to China's subsequent effort in phasing out TBT-based antifouling paint and other

	harmful antifouling systems. This need to strengthen the linkage of the phase out of DDT and the need to eliminating the risk in switching to TBT after strict control of DDT is further elaborated throughout the revised project document and Executive Summary.
Global environmental benefits	
Comment: Concern with the major challenge of implementation of the new technologies/products on a large enough scale to effect an appreciable change in existing and future environmental levels of DDT. This proposal considers the best-case scenario only. It is necessary also to consider contingency plans in the event that the alternative technologies turned out to be not useful or the proportion of fishermen taking up the offer is too small – the worst-case scenario	There is some probability for the worst-case scenario to take place and the probability will be more likely to be triggered by other factors than high-level technologies. Full mobilization and buy-in of the end users, especially the fishermen, of the new products will be crucial to guarantee the success of the project. Significant efforts have been included under activities 4.3 and 5.2 in the revised project document, and Outcomes 3, 4 and 5 in pages 3 and 4 of the Executive Summary to fully mobilize end users, influence their consumption behaviours, forge partnership and promote alternatives including incentive schemes, to assure the sustained acceptance of the alternatives.
Replicability	
Comment: It has to be emphasized that China is a country with a huge population and many unique socio-economic characteristics not shared by many nations. a direct transplantation of the current proposed work to another country will unlikely be productive or useful	Replicability of this project exists in 2 aspects: i) Experience in phasing out DDT to be replicated to phase out of TBT and other harmful antifouling systems in China and other similar regions and countries; ii) Experience in phasing out 5% of DDT used as additive to be replicated to the phase out of the remaining DDT in China and other similar regions and countries. While direct transplantation may not be realized as China is the only country still using DDT as additive in the production of antifouling paint, alternatives tested and produced locally at a more reasonable cost, will definite benefit other countries in the region. See Sustainability and Replicability under Part II of the project document and Replicability in Section 3 of the Executive Summary.
Sustainability	
Comment 1): On a number of occasions, proponents stated that support of GEF is essential in implementation this project. This does call into question the sustainability of the project after the funding from GEF has expired. The proponents need to spell out clearly (a) what part of the long-term work requires GEF support; and (b) how China will be able to sustain the efforts upon expiry of funding from this project. In the proposal, it was stated that the project "will select, through open bidding process those manufacturers that are technically and economically competitive and with sound business plans to produce and promote alternatives in the target market". It is important to realize that the success of this project will depend crucially on the participation and cooperation of small and medium sized enterprises, as well as "backyard" factories. Some clear strategies need to be developed to ensure an active involvement of all parties concerned	The GEF support is essential to the project mainly due to the incremental nature that generates global environmental benefits based on the needs of domestic sustainable development. The global environmental benefits after the completion of the project will be sustained by i) established policy to ban DDT based antifouling paint and to protect marine environment and human health from pollution of harmful antifouling systems based on the technologies, experience and instruments obtained from phase out of DDT based antifouling paint, ii) strengthened capacity to implement the established policy, and iii) commercialized alternatives to play a dominant role in the market place. These same factors, together with China's subsequent phase out actions on TBT based antifouling system, will also ensure sustainability of the phase out of DDT based antifouling paint, leading to the establishment of an environmentally sustainable antifouling system to ensure the sustainability of domestic benefits

Comment 2): The suggestion that "Favorable policies have been implemented by the state to encourage the development of ocean-going fishing and fishing in open seas, and reduce the number of small-sized fishing ships in coastal waters by encouraging fishermen adopt alternative sources of livelihood" is unrealistic in a vast developing country like China. The only way forward is to get them on board.	As reflected in the revised project document, besides compulsory phase out of DDT based antifouling paint, the project will create a bigger market for the alternatives by subsequently targeting at phase out of TBT based antifouling system. The small and medium sized enterprises can grasp this opportunity based on their local advantages on direct distribution to and interactions with the end users. They will be supported by this project to convert to production and distribution alternatives through technical trainings on available technologies. They will also be encouraged to form consortium to bid on participation and financial support to produce alternatives. Outreach efforts will demonstrate and promote to fishermen the benefits of using alternatives, including through community based activities and dealers, and incentive scheme.
Involvement of Stakeholders	
Comment: The current proposal does mention the involvement of various stakeholders. the most important group that will require special attention is the fishermen (the end-users). Given that China is a big country, and most of the end-users belong to a group which is "characterized by a relatively low level of education, environmental awareness and income", the proponents need to have a detailed plan to work with the fishermen and convince them to adopt the new technologies and used the new products. , this is vital to the success of this project. Indeed, this project requires the support of feasible and affordable technologies, timely and appropriate legislation and a strong commitment to law enforcement. Environmental improvement in this case can only be driven by the above factors, without which the project has a very low chance of success.	This project pays particular attentions to those characteristics with this group of end users. Firstly, the price of the alternatives will be carefully considered and efforts will be deployed to decrease the cost through technological improvements and other means through the support of the project to a level acceptable to the end users. Secondly, innovative cultural and community based programs/strategy of demonstration, education, incentives and partnership will be developed to promote and convince the end users to accept the alternatives. PART II of the project document describes more details on these actions.
Capacity Building	
Comment: There are plans for capacity building in the proposal. The plan is relatively clear for scientists, government officials, but is less clear for the "men on the ground". These are the people that will ultimately determine the success or failure of the project. Not enough information is there to convince this reviewer that something really different will be introduced in this project. Setting up of local offices and organizing workshops will certainly help, but will not be sufficient to mobilize many millions of fishermen and fishing boat owners to make that change. Illegal use will be a challenge unless a real substitute for DDT-based antifouling paint is found which is technically feasible, economically viable, and environmentally friendly. There are always some risks in developing technologies of this nature, and help may be needed from the wider scientific community in this regard.	Capacity will be strengthened with community based NGOs, local government departments and institutions, local partnerships that will interact activities and interact with the end-users, especially the fishermen. Substantial efforts will be deployed to targeting the end-users in promoting and demonstrating the benefits of alternatives, to change their consumption behaviours with affordable price structure and incentives, as elaborated in the revised project document. The plan will be further fine tuned during project implementation to address the vast and diverse socio-economic background the project will cover.
Interaction with end-users	
Comment: Costs involved setting up committees/offices, organize workshops/conference should be kept to a minimum so that more resources	As reflected in the revised project document, the major components of the budget are allocated to achieving regulatory measures to ensure success and sustainability

can be diverted to implementing the project at the ground level – interacting with fishermen and fishing boat owners. Rather than overseas study tour, it may be more profitable, if necessary, to invite relevant people to come to China to share experiences so that more local people can benefit	of the phase out of DDT based antifouling paint, through the promotion and production of suitable and environmentally sustainable alternatives, including China's subsequent actions to achieve phase out of TBT based antifouling system, and through extensive environmental awareness education targeting the end-users. The largest budget goes to the selection, acquisition and technological improvements of alternative technologies and the reduction of production costs so that the fishermen can accept the alternatives without extra economic burden. Substantial amount will also be devoted to addressing and interacting with the fishermen to promote the alternatives and address their consumption behaviour on alternatives.

c) GEF SECRETARIAT AND OTHER AGENCIES' COMMENTS AND IA/EXA RESPONSE

i) GEF Secretariat Concept Agreement Review on PDF-B Phase
November 1, 2005

Comments	Responses
Sustainability	
Comment: Sustainability outlined in a very conceptual way	The regulatory mechanism established and the technical and managerial capacity strengthened will lay a strong foundation and provide experience and lessons for eliminating other applications of DDT. Sustainability of this project will be guaranteed from the following aspects: i) intensive mobilization of all related stakeholders throughout the process; (ii) demonstration of the effectiveness of environment-friendly alternative technologies/ products; (iii) support capacity building at both national and local levels; (iv) formulate laws, regulations and rules to control and manage DDT based antifouling paint and promote alternatives, and provide incentives for enforcement. The successful experience will also assist to accelerate the phase out of TBT antifouling paint, support China to accede to IMO, to establish a long-term mechanism to protect marine environment and human health.
Replicability	
Comment: There seems to be little scope for replication, as China is the only country having reported such a use of DDT	It is expected that the experience gained through this project can be applied to similar or related projects within China, including eventual elimination of other DDT-based operations such as Dicofol production (PDF-B already approved). The mechanisms for establishing the regulatory framework, as well as establishing a procedure for introduction and commercialization of alternative technology will be able to be applied not only in China, but in other countries with diverse populations and large geographic areas. The education, publicity and outreach campaign developed will be easily adaptable to other applications as well.

	This project will conduct strategic study at the latter stage of implementation to replicate the experience and lessons obtained from this project to phase out TBT-based antifouling paints, that can serve as an example to other countries in the region
Stakeholder Involvement	
Comment: Evident of stakeholder involvement in project preparation. Stakeholder involvement in project implementation	Major national and local government, scientific institutions, and private sectors concerned with elimination of DDT used as additive in antifouling paint production in China have already participated actively in developing the Strategy for Phase out of POPs Pesticides under the Sino-Italian POPs project, and have been extensively involved in the PDF-B project preparation phase. Implementation of the full-size project foresees involvement of all major stakeholder groups at all phases of the project.
Monitoring and Evaluation	
Comment: M&E not outlined	Indicative M&E workplan and corresponding budget has been included in the Monitoring and Evaluation section. The Logical Framework Matrix also provides performance and impact indicators for project implementation along with their corresponding means of verification. These will form the basis on which the project's Monitoring and Evaluation system will be built.
Financing Plan	
Comment: Estimated budget of US$25 million does not seem to be supported by the list of proposed activities. Incremental costs analysis should take into account of real domestic benefits	Total FSP budget of 23.86 million USD will support activities to establish institutional setting and mechanism, build capacity for effective project management. In addition, it will establish or revise regulations, standards and incentives necessary to support a sustainable phase-out of DDT-based paints through the production, distribution and use of sustainable alternatives. GEF resources of 11.61 million USD will be used to overcome the barriers to rapid commercialization of the alternatives, establish or revise policies, regulations and standards to create enabling policy environment to sustain the conversion to eliminate 250 MT per year of DDT usage. A total of 12.25 million USD co-financing by the Government of China and the private sector will cover cost of production of alternatives, to account for the domestic benefits.
Consultation, Coordination, Collaboration between IAs and IAs and EAs, if appropriate	
Comment: Consultation and coordination in particular with Agencies that might have relevant expertise, IMO and UNIDO (RENPAP)	During preparation of FSP, IAs and EAs such as UNEP, UNIDO, as well as international institutions in developed countries have been extensively consulted, especially on existing availability and experience of alternatives. Collaboration and coordination with IMO will be further strengthened especially taking into consideration that the successful experience will assist to

	accelerate the phase out of TBT antifouling paint , banned under IMO
Terms of Reference	
Comment 1: Relevant stakeholders outside of FECO/SEPA to be engaged in project preparation	Major national and local government, scientific institutions, and private sectors concerned with elimination of DDT used as additive in antifouling paint production in China have already participated actively in developing the Strategy for Phase out of POPs Pesticides under the Sino-Italian POPs project, and have been extensively involved in the PDF-B project preparation phase. Implementation of the full-size project foresees involvement of all major stakeholder groups at all phases of the project.
Comment 2: Insufficient level of co-financing	Under FSP, FECO/SEPA has successfully leveraged 68 million RMB, or equivalent of 8.5 million USD from private sector. The central government will provide 30 million RMB, or equivalent of 3.75 million USD as co-financing, therefore a total of 12.25 million USD co-financing has been secured against the total FSP budget of 23.86 million USD.

ii) UNEP comments on PDF-B
19 December 2005

Comments	Responses
DDT usage in antifouling paint production	
Comment: China is the only country reported this use of DDT, there should be a wealth of experience to tap into before doing research in developing alternative products	During PDF-B phase, experience of developed countries has been tapped into. Available alternative technologies and products have been researched and evaluated. Initial comparative assessment of candidate technologies and possible improvements has been conducted, and criteria for selection has been defined, to be employed during FSP phase
Involvement of existing production enterprises	
Comment: More focus should be given in the inception phase to involving existing production facilities and enterprises s they are key-players. Distributors should also be included	Major national and local government, scientific institutions, and private sectors concerned with elimination of DDT used as additive in antifouling paint production in China have already participated actively in developing the Strategy for Phase out of POPs Pesticides under the Sino-Italian POPs project, and have been extensively involved in the PDF-B project preparation phase. Implementation of the full-size project foresees involvement of all major stakeholder groups at all phases of the project.
Role of end-users	
Comment: Role of fishermen not obvious. Training on application technology of alternative products is doubtful	FSP has been redesigned to establish project management institutions and build operational capacity to ensure effective implementation. End-users will be targeted through promotion of reasonable costed alternatives and through policies and regulations on DDT based antifouling paint

Regulatory measures	
Comment: Regulatory controls should be developed as a matter of urgency under component 2 on capacity building and policy making, with target dates or deadlines for phase-out	One important outcome of FSP is an enabling policy environment through establishment or revision of regulations, standards and action plans, and supported by capacity building, to create an enabling policy environment for phase-out of DDT based antifouling paint and promotion of sustainable alternatives. The successful experience will also assist to accelerate the phase out of TBT antifouling paint
Environmental burden	
Comment: Environmental burden due to DDT in paint should be calculated and described more clearly	Survey data conducted during PDF-B phase has been extrapolated to DDT usage of 250 MT per year as additive in the production of approximately 5,000 DDT based antifouling paint
Incremental cost analysis	
Comment: 25 million USD in incremental costs seem to be on the high side for the replacement of a 5% component (total 180 MT/year)	Total FSP budget of 23.86 million USD will support activities to establish institutional setting and mechanism, build capacity for effective project management. In addition, it will establish or revise regulations, standards and incentives necessary to support a sustainable phase-out of DDT-based paints through the production, distribution and use of sustainable alternatives. GEF resources of 11.61 million USD will be used to overcome the barriers to rapid commercialization of the alternatives, establish or revise policies, regulations and standards to create enabling policy environment to sustain the conversion to eliminate 250 MT per year of DDT usage. A total of 12.25 million USD co-financing by the Government of China and the private sector will cover cost of production of alternatives, to account for the domestic benefits.

iii) GEF Secretariat Concept Agreement Review on Work Program Inclusion
April 10, 2006

Comments	Responses
Alternative technologies / products	
Comments: The discussion of available alternatives and their advantages/disadvantages and what to do about it is unclear in the Executive Summary, as well as in the Project Brief. The three proposed alternatives seem to have major disadvantages. Is the project to improve on these alternatives at the table in annex suggested? - The statement that GEF alternative will support "very promising and already available technologies" is not supported by the earlier description of the limitations of the alternatives.	More detailed description of the development status of the alternatives is made in f) Candidate Alternative Technologies, Part V, Section IV in the Project Brief, as well as in page 3 and 4 under Outcome 4 of the Executive Summary to verify their availability in a technical sense. It can now clearly see that the disadvantages associated with the alternatives are lack of testing and application to move from laboratory scale experiment to scale production in factory, as well as the currently high price of (imported) alternatives. This can be overcome with the support of this project within the first year of project implementation.

	"Very promising and already available technologies" has a two-fold meaning. First, "very promising" refers to the environmental soundness and the room for technological improvement and cost reduction. Second, "already available" refers to the mature status of research and development of these alternative technologies at least in laboratory experiments and trials. In fact, most of these alternatives technologies have achieved successful patch test results. (Page 3 and 4, Outcome 4 of the Executive Summary)
Amounts of DDT and non-DDT based antifouling paints	
Comments: The IC analysis notes that production of DDT based antifouling paint has decreased since 2002, in favor of what, TBT? - 10,000 and 20,000 of antifouling paint are quoted as being used per year.	During intergovernmental negotiations of Stockholm Convention and after China signed the Convention, China has launched large scale campaigns to raise awareness of the public and related industries on the harms of POPs, including DDT, and the Government's intention to phase out these POPs. Producer, dealers and some better-off end users of DDT based antifouling paint have actively switched to other alternatives (TBT based and other alternatives). As a result, from 2002 to 2005, DDT used for antifouling paint production has seen a decrease but still reached cumulative 1,000 MT as the bulk of end users (mainly fishermen) have to stick to the use of DDT based antifouling paint due to their limited affordability of those other alternatives. 10,000 and 20,000 MT antifouling paints are quoted as being used per year respectively following the justifications below: • The PDF-B survey shows that China has 300,000 fishing ships widely distributed along its 18,000 km coastline, which consumes 10,000 MT antifouling paints annually, half (5,000 MT) of which is DDT based, while the remaining 5,000 MT is TBT based antifouling paint • It is estimated by China Maritime Bureau that commercial ships navigating in domestic sea territory will consume about 20,000 MT TBT based antifouling paints annually with a working life of 3 years, this is in addition to TBT used in fishing ships, therefore total consumption of TBT based antifouling paint is 25,000 MT per year • In addition, there are 35,000 MT consumption of TBT/DDT free antifouling paint by ocean-going commercial ships, making the total antifouling consumption of 65,000 MT per year (Page 1, Executive Summary)
Cost-effectiveness	
Comments: Can the claim that the environmental and health damage from DDT in antifouling paint far exceed the baseline cost be substantiated? (Besides the substantive point which is of interest to me, it is a strange way to word this)	No systematic evaluation has been done regarding the socio-economic and environmental impacts of DDT uses since 1950s. Marine environmental quality degradation, aquatic product quality degradation and yield decrease, and human health damage are caused by interactive factors including marine eutrophication, over harvest,

The cost effectiveness section needs strengthening.	and many other complicated factors, of which DDT use in antifouling paint is only one of the most important factors. There is a lack of thematic data and research to this use. Therefore, it is not possible to precisely evaluate the cost of environmental quality degradation and human health damage by using such methods as shadow price, opportunity cost, preventive payment, or medical care cost. Also, the benefits from using alternatives will also be difficult to evaluate. However, some practical estimation are made based on the data gathered from the PDF-B phase and literature review, and the results show the implementation of this project will achieve a significant cost-effectiveness. Part V, Section IV in the Project Brief provides more details regarding the analysis of cost-effectiveness. During the project implementation, M & E activities will gather the needed data for a more precise and comprehensive evaluation of the project cost-effectiveness. See also Section 4 b) of the Executive Summary
Sustainability	
Comments: Please elaborate on sustainable production phase out (quota system for example)	Due to the urgency to stop this DDT usage in the production of antifouling paint, the project does not rely on a quota system, but adopts multiple means including policies, technological and market instruments to switch the production of DDT based antifouling paint to the production of alternatives swiftly in the beginning phase of project implementation, with the market instruments to play the decisive role in the latter stage and to sustain the production of alternatives after the completion of the project based on the established regulatory systems and improved capacities from the project, and the opportunity for profit by the manufacturers. (Outcomes 3 and 4, page 3 of Executive Summary)
Indicators and targets in Log Frame	
Comments: The Log Frame includes numerous indicators and targets. Probably too many to be useful as a tool to access whether, ultimately, the project is a success or not. It would be useful to pull out some sort of "results" table with a limited number of the most meaningful quantifiable indicators and targets, one/two per component. The table for M&E work plan looks comprehensive but includes too many "responsible parties" To be meaningful, that column should only list the main "Party" responsible for the particular M or E activity, not all the people involved.	Some most meaningful indicators are extracted from the Log Frame in the Executive Summary and added to Table 2 in the Project Brief as key impact indicators. Only the main "Party" responsible for the particular M&E activity is kept in Table 1 - for M&E work plan in the revised Project Brief.
Longer term monitoring and evaluation	
Comments: It is unlikely that levels in organisms will be seen to decrease over the life of the project (4 years) in a significant way as suggested, but the project	Activity 2.2 under Outcome 2 in the Project Brief has been revised to include the establishment of a mechanism to ensure long-term information flow to

should established a baseline against which longer term progress can be gauged. This implies that the Chinese authorities establish a monitoring protocol and commit to reported to the COP under Art. 16 on reductions in environmental levels of DDT in the coastal zone as a result of the phase out of DDT used as antifouling paint.	facilitate reporting requirements, after completion of the project. (Outcome 2, page 3 of Executive Summary)
Co-financing	
Comments: The contribution expected from the private sector needs to be better described to provide justification for the claim of US$8.5 million co-financing from the enterprises.	During the PDF-B phase the CIO has had extensive communication with antifouling paint manufacturers and achieved positive response from them in providing co-financing to the project. The CIO published a call for expression of interest in its official website (www.chinapops.org), and notified all the antifouling paint manufacturers in China by email, telephone and meeting. So far, 7 enterprises have submitted their commitment to providing co-financing. Their in-kind contributions in fixed assets have also been verified by independent asset evaluation entities. During project implementation, 3 to 5 enterprises will be selected to provide a total co-financing of 68 million RMB, or equivalent of 8.5 million USD, for production and promotion of alternatives in this project. In-kind co-finance from enterprises will cover land acquisition and plant construction, production equipment, analytical instruments, raw materials, employee salary, enterprise R & D and training, and advertisement expenses. Letters of commitment to providing co-finance are annexed to Annex E of the Executive Summary.
Education and awareness raising	
Comments: Nearly 2 Millions "incremental costs" for funding education and awareness raising" seems extremely high.	DDT based antifouling paint is sold to local paint stores, ship maintenance plants or individual fisherman and thus it would be risky if these key stakeholders are not fully involved in phasing out of DDT based antifouling paint. The risk may be increased with the 12 million stakeholder fishermen sparsely distributed along the coastal provinces. It would therefore be hard to realize the project's objectives without improving the awareness and promoting consumption choice of this group towards more environmentally friendly products. 2 million USD will cover the expense of activities to conduct extensive interactions with the stakeholders, especially the end users. A major part of the budget will be used by NGOs in civil society, local universities and non-profit entities to undertake environmental awareness raising activities and promotion of the alternatives.

国家环境保护总局对外合作中心

March 20, 2006

Alternatives to DDT Usage in Production of Antifouling Paint (FSP)

Indicative Letter on Co-financing

During the PDF-B stage of the project captioned above, Foreign Economic Cooperation Office, State Environment Protection Administration of China has achieved fruitful progress in leveraging co-financing from Chinese central Government and enterprises for.

i) 30 million RMB (equivalent to 3.75 million USD) in cash from Chinese Central Government mainly used for legal and institutional strengthening and capacity building; and

ii) 68 million RMB (equivalent to 8.5 million USD) in kind from enterprises for production and promotion of alternatives.

As a result, the total co-financing reaches a total of 98 million RMB (equivalent to 12.25 million USD).

Zhuang Guotai

Director General
Foreign Economic Cooperation Office
State Environment Protection Administration
China

Commitment Letter

Central Government Counterpart Fund

In order to promote the progress of implementation of Stockholm Convention in China, and to carry out the alternatives to DDT usage for anti-fouling paint production in China project, FECO pledges utilizing 30 million RMB fund in cash provided by the central financial on international environment convention implementation and international environment cooperation as counterpart fund during the four-year implementation period of the project (2006-2009). The fund will be the project's co-financing fund, and will be allocated yearly according to the project plan and progress.

Zhuang Guotai

Foreign Economic Cooperation Office

State Environment Protection Administration

March 16, 2006

中 华 人 民 共 和 国 财 政 部

Ministry of Finance, People's Republic of China

December 29, 2005

Khalid Malik
Resident Representative for China
United Nations Development Programme

China: Endorsement Letter for GEF Alternatives to DDT Usage for Anti-fouling Paint Production Project in China

This is to advise you that Ministry of Finance, as the GEF Focal Point of China, would like to endorse the captioned project proposal to be submitted by the United Nations Development Programme (UNDP) for GEF support.

The main objective of the project is to make nationwide strategy to eliminate the use of DDT as an additive in anti-fouling paint, and develop suitable alternative technology for shipping and fishing industries.

China has already ratified Stockholm Convention and this project is in accordance not only with China's development strategies but also with GEF's priority supporting areas. We believe China will contribute to global environmental benefits by implementing this project and disseminating successful experiences.

We are looking forward to fruitful cooperation with UNDP on this project.

Best regards

Sincerely yours

(吴晋康)

Wu Jinkang
GEF Operational Focal Point of China

San Li He St., Xichengqu, Beijing 100820, People's Republic of China
Tel: (86-10) 6855-1118 Fax: (86-10) 6855-1125