

Annual Project Report

[Alternatives to DDT usage for Anti-fouling Paint production in China]

[January 22, 2014]

Basic Project Information

Project Title: Alternatives to DDT usage for Anti-fouling Paint production in China	
UNDP Award ID	00045358
UNDP Project ID	00053562
Project Duration	November, 2007-December, 2013
Reporting Period	January to December 2013
Total Approved Project Budget	\$10,365,000
Participating UN agencies	N/A
Implementing Partners/ National collaborating agencies	Foreign Economic Cooperation Office, Ministry of Environmental Protection, China
International collaborating agencies	N/A
Cost-sharing third parties	
UNDP Contact officer	Mr. Wu Peng
Project website	http://afp.china-pops.org

Executive Summary

The project implementation has achieved remarkable progress and results in 2013. First, the capacity building for the competent authorities has enabled the incorporation and enforcement of risk assessment requirements in the antifouling paint sector. Second, a new round of alternatives selection has been launched based on efficacy and risk principles so that the technological advancement can be caught up. Third, implementation of the second and third stages of incentive programs for promotion of production and consumption of alternatives has significantly increased the market share of alternatives. Fourth, cleaner production of ship hull surface processing and painting has been successfully demonstrated manifesting win-win situation of economic earnings and environmental protection, which is expected to motivate more private enterprises' involvement, and local government in for the pilot also formulated policy and guidelines to further promote alternatives usage. Fifth, demonstration of environmentally sound removal of paint residues in ship recycling has been launched to tackle the infamous pollution of the sector. Sixth, reduced concentrations of DDT and metabolites in sea

water and sediments is observed and supported by real environmental monitoring and analysis. Seventh, an effective public and private partnership mechanism including government, research institute, associations and private sector is in place to promote new alternatives.

With the project approaching the end, the focus of the project implementation shall be put on the finalization of all project activities and distillation and dissemination of project lessons and experience. In addition, socio-economic survey shall be carried out to support the terminal evaluation of the project.

1. Background

Development Context

China has 300,000 fishing ships widely distributed along its 18,000 km coastline, which consume 10,000 MT antifouling paints annually. Approximately half is DDT based paint and half organotin-based paint. About 250 MT DDT is 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. China began to limit DDT usage in all related sectors after China acceded to Stockholm Convention in 2002. From 2002 to 2005, DDT used for antifouling paint production has seen a decrease, but still totalled a cumulative 1,000 MT.

Rapid industrial and agricultural development in the coastal areas of China in the recent past has resulted in contaminant discharge into the sea in excess of regulatory limits. This has resulted in significant deterioration in the quality of coastal marine environment as well as reduction in species of economic fish and output and has had adverse effects on income and livelihood of the local fishing community. Results from monitoring study indicates that the quantity of some toxicants found in economic fish, including DDT, in the body of main economic fish species is increasing, even beyond related international regulatory limits. The sources of some of the toxicants have been corroborated to be from their usage in coating of boats and ships. With the entry of China into WTO, her marine product exports have had some constraints in international market because of their failure to meet the relevant Quality Safety Standards.

Coastal environmental quality monitoring from year 2000 to 2005 found 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 exceeded Class I or II of marine environment quality standards limit. Cu in sediments was also found to exceed Marine Environment Quality Standards. Sediment is habitat to the benthics, e.g. *Meretrix meretrix* L., *Mactra quadrangularis* Deshayes, *Mytilus edulis*, and Oyster, whose quality will be directly influenced by the sediment quality. For instance, in 2004, monitoring results showed that DDT residue in seashell in coastal waters exceeded standard's limit. DDT and Cu are also detected to exceed standard in bred organisms in the coastal aquatic farms.

The excess DDT and Cu concentrations in sediment are directly related to their extensive usage in DDT and copper based antifouling paint. Use of DDT as a pesticide in agriculture was banned 20 years ago. DDT residues on land, soil, and food have fallen down to trace levels. Therefore, release of DDT from antifouling paint on fishing boats and ships can be considered a new and the 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 on 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. 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. As one of the actions in implementation of the Convention, China has listed DDT based antifouling paint into the recently issued list of products to be phased-out, annexed to The Guiding Directory for Industrial Restructure – 2005.

In cooperation with the United Nations Development Program (UNDP), a project titled Alternatives to DDT Usage in the Production of Antifouling Paint has been developed and got GEF Council approval on August, 2006, and GEF CEO Endorsement on July, 2007. The State Environmental Protection Administration of China (SEPA), through its Convention Implementation Office (CIO/SEPA), and the UNDP will be respectively the national executing agency and the international implementing agency of this project from November 2007.

Project Objectives and Strategy

The project goal is to substitute DDT based antifouling paint by technically feasible, economically viable, and environmentally friendly alternatives. The binding objective of this project is to eliminate 250 MT DDT per year 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 Anti-fouling Systems on Ships (the IMO Convention) based on the technologies, experience and instruments obtained from phase out of DDT antifouling paint.

The implementation timeframe is planned to be 5 years. In the first two years, technically and economically feasible technologies/alternatives will be selected through open bidding and ranking process for on-ship coating experiment as well as for selection of manufacturing enterprises that possess strong technical capacity, competent management experience, and sound business development plans. Manufacturing sites will be prepared and equipment installed. Capacity will be built and policies providing enabling environment will be established. In the third and fourth years, production and promotion of the substitutes/alternatives in the market will be initiated and upscale. In

the fifth year, results and experience will be summarized and compiled into reports, while at the same time the production and sales of the alternatives will be further consolidated.

Project Outcomes

The major outcomes of 2013 include: (1) capacity building for the competent authorities to incorporate and enforce risk assessment requirements in the antifouling paint sector, (2) a new round of alternatives selection based on efficacy and risk principles, (3) implementation of the second and third stages of incentive programs for promotion of production and consumption of alternatives, (4) cleaner production demonstration of ship hull surface processing and painting at shipyards aimed at experience distillation and dissemination, (5) demonstration of environmentally sound removal of paint residues in ship recycling, and (6) reduced concentrations of DDT and metabolites in sea water and sediments supported by real environmental monitoring and analysis.

Activities and Outputs

Activity 1.1 Establish project management institutions and coordination mechanisms

The national project management team has maintained a regular communication and reporting mechanism with UNDP through meetings and reports on AWP, QORs, PIR, and APR. Intensive travels have been carried out in order to inspect the progress of the subcontracts with or without companion of project experts, UNDP, and the local PMOs depending on actual needs.

The local PMOs have fully played their local advantages in organizing, coordinating, and supervising the implementation of major programs including contaminated site investigation, incentive program promotion, and awareness raising within their jurisdictions together with the national project management team, project consultants, and subcontractors. The local PMOs have been involved in trainings on the incentive program and awareness raising campaigns. The specific outputs of these programs will be introduced under the specific activities in the following parts.

Activity 1.2 Establish a national expert team to provide technical and consulting supports to the project implementation

The contracts with CTA, NTA and the risk assessment specialist have been renewed according to annual work plan.

Activity 1.3 Conduct trainings to improve managerial and technical capabilities for project management

Completed and reported in previous APRs.

Activity 1.4 Conduct study tour abroad to learn advanced experience and technologies

During November 20-27, 2013, with the support of UNDP, FECO organized a delegation consisting of an official in charge of chemicals management at Ministry of Environmental

Protection, the project director at FECO, the project officer, 2 project officers from the local project management offices, and 2 industrial specialists to visit US and Canada for their advanced experience in antifouling biocide management in specific and chemicals management in general. The delegation has been well received by the US EPA, Canadian Paint and Coatings Association, AkzoNobel, and Sherwin Williams Chemical Group Co., Ltd., and has been able to learn experience in biocide registration, risk assessment, and environment care for the industry.

Activity 2.1 Establish an MIS and website for the project

The development of MIS and website are completed and reported in previous APRs, the operation and maintenance is still ongoing.

Activity 2.2 Establish a mechanism for data collection, processing and analysis of data, transmission and information sharing

FECO commissioned SGS to carry out the sampling and analysis of DDT, TBT, and copper concentrations in sea water, sediment, organisms, and air. The sampling spots are identical with the ones for baseline monitoring so that the results can be compared to reflect the project performance and impacts. The analytical data of most of the sampling points shows that there is significant drop of concentrations of DDT and metabolites over the project implementation period, and the existing concentrations are well within the limits stipulated by the quality standards for sea water, sediment, and organisms.

FECO has contracted China Green Enterprise Limited to carry out the socio-economic assessment of the project. A work plan has been prepared, the survey has been initiated, and the final assessment report will be completed after closure of major project activities.

Activity 3.1 Establish or revise related regulations, standards, and rules

The study on standard draft Technical Requirement for Environmental Labeling Products has been conducted. The relevant risk assessment principles and procedures developed by this project are included in the standard to determine the level of risks of the active substances added to antifouling paints.

The environmental labeling standards are supposed to be met by top 30% products in the industry which will lead the rest 70% to catch up with the higher standard. In this logic, the environmental standards will be updated on a dynamic basis. The standard developer has collected representative samples from antifouling paint manufacturers to verify this criterion. The contents of various regulated substances have been tested in certified labs. The final values for the limits have been readjusted based on the results from the laboratory tests.

Activity 3.3 Establish and promote a voluntary certification and labeling program in the antifouling paint sector

The Environmental Labeling standard coded HJ 2515-2012 has been promulgated and came into effect by the Ministry of Environmental Protection in June 2012. To encourage antifouling paint manufacturers to upgrade their technologies and products to meet the

standard, 50,000 RMB will be reimbursed upon successful certification of each product as an incentive. The deadline for the promotion program is April 15, 2014.

Activity 3.5 Strengthen the capacity of related departments to effectively enforce the regulations, standards and action plan

Rounds of dialogues have been held with China Fishing Vessel Register under the Ministry of Agriculture and China Classification Society, two ship product certification authorities in China, to push them to incorporate the risk assessment into the certification system for antifouling paint products. The ultimate purpose of such incorporation is to ensure the sustainable adoption and application of risk assessment criteria after the project completion, and establish a long-term mechanism for preventing harmful high-risk antifouling paint products from entering the market and causing harms to human health and the environment.

Specifically, they are required to add risk assessment into their technical requirements for antifouling paint product certification, to designate qualified laboratories for eco-toxicological tests and risk characterization, and to review all certificates already issued and certificate new products against risk assessment criteria.

China Fishing Vessel Register revised its certification rules for antifouling paints to ban the use of DDT and TBT. On September 26, 2013, a training workshop was organized to impart the new requirements to fish product inspectors, antifouling paint manufacturers, and shipyards from 11 coastal provinces. More than 100 people participated in the workshop. Three laboratories have been accredited and contracted for detection of DDT and TBT contents in antifouling paints after the inspection and validation of their equipment, staffing, and QA/QC system. Samples of 17 products have been collected, prepared, and analyzed in terms of the DDT and TBT concentrations, and found none of them have the DDT and TBT concentrations exceeding the limits stipulated by the national product standard GB/T 6822-2007 for antifouling paints.

China Classification Society has developed a special guideline for certification of antifouling paint containing biocides. The guideline has incorporated the risk assessment methodology. Meanwhile, the resources requirements for laboratories to carry out risk assessment have been put forward. A comparative study has identified a positive list of active substances to which there is adequate toxicological and eco-toxicological data available from the public domain. Paint manufactures are exempted to carry out risk assessment on these substances, but the risk assessment of antifouling paint products containing these substances is still needed. Should any paint manufacturer use active substance not listed, risk assessment on the substance and the product shall be carried out. In October 2013, a training workshop to impart the requirements and methodology for risk assessment was organized to target about 80 marine surveyors and manufacture representatives.

Through the implementation of the above capacity building activities, experience and instruments achieved can also shed lights to the implementation of relevant international conventions such as *International Convention on the Control of Harmful Anti-Fouling*

Systems on Ships, Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, and International Convention for the Control and Management of Ship's Ballast Water and Sediments.

Activity 4.1 Test, select and acquire alternative technologies.

To encourage more qualified alternatives entering into the market, the project has organized a new round of alternative selection, recognizing the advancement of technologies since the inception of the project. This round of selection has adopted the same methodology with the first round, except that efficacy should be supported by test report made by authorized test institutions. In total, 24 products from 11 manufacturers have passed the selection.

Activity 4.2 Select demonstration enterprises and business plan improvement

FECO and UNDP supported by technical and financial consultants have discussed and finalized the methodologies for the monitoring and verification of the alternatives production and consumption. Technically, the formulations and physicochemical properties of the alternatives should be verified at the points of production, distribution, and application in the middle and end of the second stage of the incentive program. Financially, all sorts of transactional invoices and evidences should be verified to reach a final number of alternatives produced and distributed. One of the striking differences of Stage II and Stage III incentive program is the design of promotional activities that intend to drive demands of alternatives and benefit end consumers (shipyards and ship owners). Enterprises are encouraged to use a combination of promotional activities such as discount, free gifts, and coupons.

The whole texts of the incentive program were published through the websites of FECO, China Coating Industrial Association, and China Environment Daily. Nine antifouling paint manufacturers submitted their expressions of interests with a package of supporting materials showing qualifications and eligibility. On December 28, 2012, an information session was held targeting the 8 manufactures to impart the incentive program and the verification requirements before they prepare their business plans for Stage II. A similar information session was held for Stage III on June 20, 2013. Through these enabling activities, the project team has received proposals of satisfactory quality, and signed agreements with the manufacturers.

Activity 4.3 Produce, distribute and promote alternatives

FECO commissioned China Coating Industrial Association for technical verification of alternatives production and consumption, and Ruihua Certified Public Accountants (an accounting firm) for financial verification for the second and third stages of incentive program. The two institutions have conducted middle and final verifications following the methodologies determined and published at the information sessions. The two tables below give the verified results. Based on the results, FECO have disbursed the incentive funds accordingly.

Table 4.3.1 Production and distribution of alternatives in Stage II (February to July)

Manufacturer	Planned production (ton)	Verified promotional distribution (ton)	Verified non-promotional distribution (ton)	Total	Distribution as gift (ton)	Unverified (ton)
Rongcheng Hongyuan Chemical Ltd.	137.51	137.51		137.51		
Qingdao Jiaweite Chemical Ltd.	102.04	71.55	30.41	101.96	6.50	0.08
Qingdao Oceanic Chemical Research Institute Ltd.	11.40		11.40	11.40		
Zhejiang Yutop New Materials Co., Ltd.	215.79	185.12		185.12		30.67
Ningbo Feilun Coating Ltd.	81.97		11.59	11.59		70.38
Zhejiang Feijing Coating Ltd.	359.18	321.25	37.93	359.18		
Changzhou Tian'an Special Coating Ltd.	57.32	54.56	2.76	57.32		
Total	965.21	769.99	94.09	864.08	6.50	101.13

Table 4.3.2 Production and distribution of alternatives in Stage III (July to November)

Manufacturer	Planned production (ton)	Verified promotional distribution (ton)	Verified non-promotional distribution (ton)	Total	Distribution as gift (ton)	Unverified (ton)
Rongcheng Hongyuan Chemical Ltd.	75.87	75.87		75.87		
Qingdao Jiaweite Chemical Ltd.	65.07		65.07	65.07		
Qingdao Oceanic Chemical Research Institute Ltd.	9.52		9.52	9.52		
Zhejiang Yutop New Materials Co.	160.65	160.43		160.43		0.22

Ltd.					
Ningbo Fellun Coating Ltd.	127.21	59.387	62.628	122.015	5.195
Zhejiang Feijing Coating Ltd.	345.051	345.051		345.051	
Shanghai Kailin Coating Manufacturing Plant	425.729	422.551	1.978	424.529	1.20
Shanghai Kaiyue Coating Ltd.	224.252	1.920	218.172	220.092	4.16
Total	1433.352	1065.209	357.368	1422.577	10.775

Upon the completion of the incentive program, the incentive program consultant has made a summary of lessons and experience which can be of reference value for the implementation of similar projects in the future.

Activity 4.4 Conduct environmental sound management of DDT at contaminated sites

The risk assessment on typical contaminated sites of DDT antifouling paint using shipyards and DDT antifouling paint manufacturing factories was completed with practical recommendations made for improving the environmental management of these sites. Following the risk assessment on contaminated sites of shipyards, the PMOs in the South Sea Area and the Huang-Bo Sea Area have prepared proposals for demonstrating and promoting cleaner production in shipyards.

Four shipyards have been selected to pilot the cleaner production initiative in Guangdong and Shandong Provinces, where there is concentrated distribution of shipyards. The cleaner production has focused on the ship hull surface processing and painting, meanwhile also looking at areas for energy and resources efficiency and pollution abatement. Audit reports show that the cleaner production options piloted have generated significant economic and environmental benefits, worthy of widespread dissemination. Guidelines have been prepared by distilling experience from the pilot, and are being circulated for comments before promulgation at the provincial level. In the 2014, training workshops will be organized to impart the experience to other shipyards.

Recognizing ship recycling can be a significant source of release into the environment of antifouling paint residue containing harmful biocides such as DDT and TBT, the project has supported an initiative for environmentally sound removal and management of antifouling paint residues from ship hull. Zhoushan Changhong International Ship Recycling Co., Ltd. has been selected to implement the initiative in association with Zhejiang University. The consortium has first detected the types and contents of harmful antifoulants in the residue. The surface covered with paint residue will then be

transferred to a closed negative-pressured space for mechanical removal of the paint residue. The dust and VOCs from this process will be collected into a baghouse for filtration and purification before emission into the air. All residues will be collected and contained in special containers with labels pasted indicating the components and hazards of the materials, and finally transferred for disposal at a licensed facility. Experience from the initiative implementation will be summarized for the formulation of a guideline, which will then be disseminated in the industry.

Since this initiative is the last substantial activity to be launched, its implementation will extend into March of 2014. At present, the key equipment has been procured. It is expected that the installation will be completed by end of January 2014 and operation will be started in February.

Activity 5.1 Prepare publicity materials

The 3 local PMOs in North Sea Area, East Sea Area, and South Sea Area have developed publicity materials in diverse forms for raising awareness of the public and key stakeholders.

In North Sea Area, the local radio station has opened a special program of which phasing out and substitution of harmful antifouling paints was a topic. A training workshop has been held at an important sea fishing harbour in Weihai city to impart regulations and knowledge about antifouling paints. Alternatives promotion campaigns have been organized among shipyard owners and ship owners. Officials from competent authorities of all coastal cities in Shandong Province have been convened to receive trainings on inspection and enforcement of updated regulations.

In South Sea Area, public service advertisements have been taken to publicize the phase-out and substitution of DDT and other harmful antifouling systems. A series of trainings and information exchange sessions have been held to target different stakeholders for improving their awareness. A knowledge contest has been organized to instigate the concern and participation of the public into the care of marine environment free of pollution from antifouling paints. Traditional media such as newspaper and posters as well as Internet have been used to widely disseminate the information and experience from the project.

Activity 5.2 Mobilize NGOs to conduct community based environmental education and awareness rising

The local PMOs have effectively mobilized volunteers from universities and civic NGOs to go into fishing villages, fishing harbours, shipyards, and markets for distribution and dissemination of information and experience from the project.

Activity 6.1 Conduct meetings for project inception, review progress and project results

On January 10, 2014, FECO organized the annual review meeting with UNDP, three local PMOs and major subcontractors to review the annual implementation progress and

identify remained activities undone before the project completion. The work plan before the project completion has been put forward. The work plan for 2014 focuses on the completion of all project activities and distillation and dissemination of lessons and experience. In addition, socio-economic survey will be carried out to support the terminal evaluation of the project.

Activity 6.2 Launch field investigations and inspections to monitor and evaluate progress of project implementation

The project team supported by the CTA, NTA or risk assessment specialist has carried out a series of inspection missions to guide the implementation of major project activities:

- Visit to Shanghai Academy of Public Measurement and Guangdong Detection Center of Microbiology on August 26-30, 2013
- Visit to Zhoushan Changhong International Ship Recycling Facility on September 25, 2013
- Visit to Shanghai Academy of Public Measurement on November 4-8, 2013
- Visit to the pilot shipyard demonstrating cleaner production in South Sea Area on January 6, 2014
- Visit to Guangdong Detection Center of Microbiology on January 7, 2014
- Visit to the 2 pilot shipyards demonstrating cleaner production in North Sea Area on January 8, 2014

Activity 6.3 Prepare progress reports to monitor project progress and performance

The project team has prepared and submitted to UNDP the annual project review (2013), the project implementation review (2013), and the annual work plan (2013), 4 quarterly operational reports, and 3 quarterly project reports according to the M&E requirements of UNDP and GEF during this reporting period.

Activity 6.4 Conduct annual project audit

The national audit team has taken routine audit over the project.

Sustainability

The sustainability of the project has been achieved through the following measures:

- The project has strengthened the policy and regulatory framework to enable and sustain the elimination of use of DDT and other harmful substances in the antifouling paint production, including product standards, testing method, risk assessment method, environmental labelling standard, ban, and other forms of administrative orders. These legislative pieces will continue to be effective for the sector after the completion of the project.
- The capacity of the competent authorities to enforce these legislative pieces has been built. Risk assessment requirements have been incorporated into the process of antifouling paint product certification. Intensive trainings have been organized by the competent authorities among the ship inspectors and the antifouling paint manufacturers. Meanwhile, two laboratories have been supported to build their capacity for hazard and exposure assessment and risk characterization of antifouling paints.

- The industrialized production and distribution of alternatives by enterprises have taken a significant and increasing share of the market. Normally, enterprises have the motivation to continue the supply of such products to the market while keeping the price going down.
- There is strengthened awareness among the end users and the general public about the harms and benefits in choosing antifouling solutions. Consequently, this will force the suppliers to phase out polluting products and turn to the production of environmentally friendly ones.

The sustainability of the project impact will be continuously strengthened and consolidated by the widespread experience dissemination at the end of the project implementation.

Partnership Effectiveness

At the national level, the project has worked closely with the competent authorities, namely China Classification Society and fishing vessel register for phasing out harmful antifouling systems and establishing risk management regime for antifouling biocides. China Coating Industrial Association has been involved in the mobilization of enterprises in the participation of the incentive program and alternatives selection campaign. The local EPB have been trusted to organize the pilot initiatives for cleaner production of ship hull surface processing and painting at shipyards for they have the mandate to control pollution within their jurisdiction.

Cross-cutting Issues

Economic loss of aquatic product export will be incurred by the excessive DDT contents. The increase rate of aquatic product export in 2005 was reduced by 14% as compared with that in 2004, mainly due to the over residual of pesticides. While it is hard to quantitatively determine the impacts of DDT usage in antifouling paint to the aquatic product quality, it should be a significant factor due to direct release of DDT into coastal waters and accumulation in aquatic products.

The ultimate substitution of DDT usage in the production of antifouling paint depends on the private sector, including the suppliers and demanders of the antifouling products. From the very start, the project spends great efforts to mobilize the international manufacturers and domestic manufacturers to research, develop, and demonstrate their alternatives to DDT under the support of this project. International companies showed reluctance due to the low profit margin by manufacturing and selling short-life antifouling paints to fishing ships. However, the project has successfully attracted the domestic enterprises and research institutions. They are also committed to produce and sell the tested qualified alternatives under the incentive program. Awareness raising activities have been and will continuously be launched among the end users including the shipyards and individual ship owners to pull the demand of alternatives.

3. Project Management and Oversight

Implementation status

Basically, most major components of the project have been completed with measureable outcomes. The project will be operationally closed by June 2014, and the work remained mainly includes: (1) supervision and guidance over the still ongoing activities, and (2) the distillation and dissemination of project lessons and experience. UNDP and FECO shall keep closer communication for ensuring the project activities as planned can be done efficiently and effectively.

Human Resource Management

The successful project implementation depends on the availability of a wide range of expertise from R&D of antifouling technologies, antifouling paint production and marketing, chemicals regulations and enforcement, and public relations. UNDP and FECO's platforms and networks of expert human resources have provided the project with sufficient choices of qualified experts in developing and delivering the knowledge and know-how to the industries, regulators, and the public.

Monitoring and Evaluation

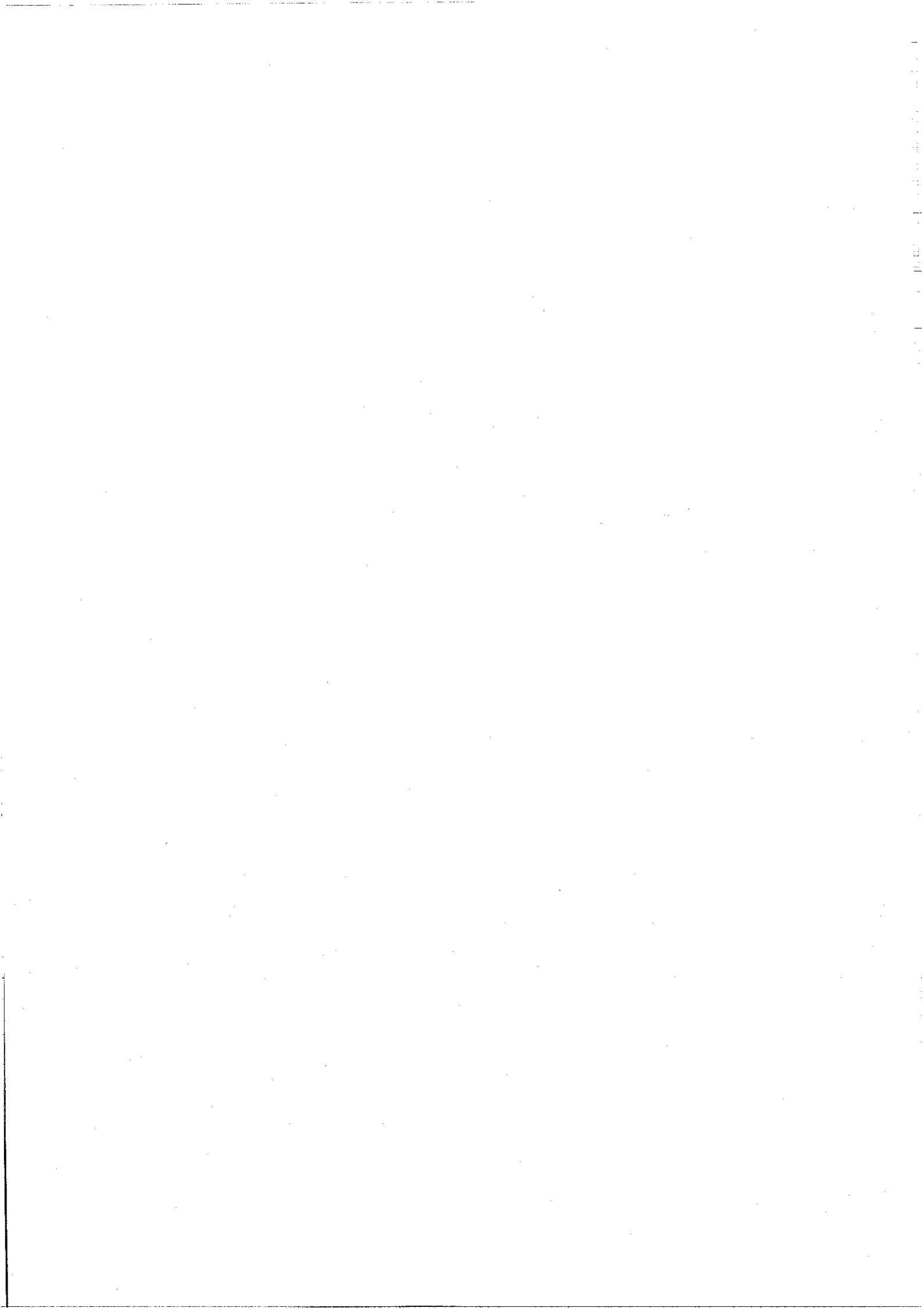
Mid-term evaluation conducted from June to Sept 2010. And the annual review meeting for 2013 was held on Jan 10th 2014 in Beijing. In addition, the project management team has conducted regular inspection missions to major project sites as reported above in the part of Activities and Outputs.

Risk management

The major risks of the project lied in the failure in successfully selecting out a good number of alternatives for promotion. These risks have been overcome by the effective mobilization and involvement of the industry into the test platforms provided by the project.

Communication and advocacy

The project has implemented a holistic strategy for the communication and advocacy. In the first half cycle of the project, the emphasis has been put on the dissemination of information regarding the harms of DDT and methods in researching and developing alternatives. In the second stage, the emphasis has been shifted to the choices of alternatives and benefits from using alternatives. The national project management team has adopted Internet, newspaper, and information sessions for the dissemination of information regarding the incentive program so that the enterprises, distributors, and the general public can be highly mobilized in the participation in the incentive program.



4. Financial Management

Expenditure Vs. Approved project budget by source of funding	Source of Fund	Budget (Year)	Expenditure
UNDP		6,316,739.42	4,733,146.14
Government Cost Sharing			
Third Party Cost-sharing			
Other (please specify)		6,316,739.42	4,733,146.14
Total			

Output	Activities	Source of Funding	Budget Description	Annual Budget (USD)	Annual Expenditure (USD)	Note
Output 1 Establish Project Management Institutions and Build Operational Capacity	1.2 Establishment and operation of a national expert team	71300	NTA's technical support to the project management	22,500	30,900	
	1.4 Study tour abroad to learn advanced experience and technologies	71200	CTA's technical support to the project management	35,000	0	
	2.1 Establish an MIS for the project	71600	Organize a training workshop and study tour for learning advanced experience	12,500	0	
	2.2 Socio-economic baseline establishment surveys and environmental monitoring	71600	MIS update	80,000	56,707.99	
Output 2 Establish MIS and Website	2.1 Establish an MIS for the project	72100	MIS update	28,000	28,000	
	2.2 Socio-economic baseline establishment surveys and environmental monitoring	72100	2.2.1 Updated environmental monitoring of contents of DDT, TBT, and Cu in the environmental media and sea organisms at typical sites	103,500.00	78,270.05	
		72100	2.2.2 Carry out project impact	96,000	86,400	

				and performance assessment		
	2.3 Disseminate project information to the public	72100	Maintain and update the website	15,000	13,500	
		71300	3.4.1 Design the plan for institutional capacity building	5,400	5,400	
		72100	3.4.2 Institutional capacity building of China Classification Society for phasing out harmful antifouling systems including DDT and TBT	270,000	270,000	
		72100	3.4.3 Institutional capacity building of fishing vessel register for phasing out harmful antifouling systems including DDT and TBT	117,000	117,000	
		71300	3.4.4 Institutional capacity building for environmental protection sectors for establishing risk management of antifouling biocides	18,000	18,000	
		72100	3.4.4 Institutional capacity building for environmental protection sectors for establishing risk management of antifouling biocides	810,000	720,000	
		75700	3.4.4 Institutional capacity building for environmental protection sectors for establishing risk management of antifouling biocides	25,000	6397.37	
		72100	Collect and analyze antifouling paint samples from 3 sea areas for detection of DDT and TBT contents	40,000	40555.83	
Output 3 Establish or Revise Regulations, Standards, and Action Plan	3.4 Sustain DDT phase out by reducing the potential risk of TBT use in antifouling paint					
	3.5 Strengthen the capacity of related departments to effectively enforce the regulations, standards and action					

Output 4 Select alternatives and promote conversion	4.1 Test, select and acquire alternative technologies	72100	Launch a new round of alternatives selection	185,300	117,000
	4.2 Technology transfer promotion	71200	International risk assessment specialist recruited	44,000	26,400
Output 5 Promote Awareness	4.3 Produce, distribute and promote alternatives	72100	Promote technology transfer from the research community to the industry	63,000	20,910
		71300	Activity 4.3.1 Recruit consultants for provision of technical guidance for the cost-effective implementation of the incentive program	32,800	24,400
	72100	Activity 4.3.2 Implement the second and third stage of the incentive program	2,164,800	1,595,069.27	
	75700	4.3.3 Trainings and workshops	15,000	11,088.52	
	72100	4.4 Identify levels of contamination and environmental risk assessment in DDT based antifouling paint production	1,442,359.42	1,230,734.18	
Output 5 Promote Awareness	5.1 Prepare publicity materials	75700	Demonstration and replication of cleaner production at shipyards	20,000	14,575.11
		71300	Prepare publicity materials of different forms	30,000	16,000
		72100	Support the 3 local PMOs for coordination and communication of selected project activities	91200	0
		72100		120,880	49,046.31

Output 6 Monitoring and evaluation	5.2 Mobilize NGOs to conduct community based environmental education and awareness	72100	Outreach and communication of project impacts	25,000	0
		71300		30,000	19,373.93
		72200		80,000	75,100.32
		72400		29,000	479.90
		72500		72,000	2,938.02
	6.2 Launch field investigations and inspections to monitor and evaluate progress of project	73100	Daily project management, operation and monitoring site visit	0	7,073.16
		74200		16,000	217.31
		71600		45,000	21,523.93
		74500		19,000	10,393.45
		75700		27,000	15,028.98
		72100		40,000	0
		71200		10,000	0
	6.3 Prepare progress reports to monitor project progress and performance	71300	Carry out independent terminal evaluation	2,000	0
		71600		18,500	0
6.4 Annual NEX audit (CNAO)	72100	Annual project audit	16,000	4,663.71	
		Total	6,316,739.42	4,733,146.14	75%

Remarks: The project activities have been intensively implemented in 2013, and most activities are completed with measurable outcomes. Since the completion deadline for some of the outcomes is December 31st, therefore the contract payment cannot be made in 2013, and this is the reason for underspending compared to the year budget.

5. Management recommendations

With the project approaching the end, the focus of the project implementation shall be put on the finalization of all project activities and distillation and dissemination of project lessons and experience. In addition, socio-economic survey shall be carried out to support the terminal evaluation of the project. Communication and advocacy should also be strengthened to better summarize the project results and better share with other key stakeholders.

6. Annex/es

N/A.