

Progress Report of ECF Funded Research Projects

Purpose

This paper updates Members on the progress of the on-going and recently completed research projects funded by the Environment and Conservation Fund (ECF).

Progress

2. As at 31 December 2007, there are 15 on-going research projects funded by ECF. A summary of these projects in respect of its approved project schedule, approved grant and outstanding commitment is given in **Table 1**. Detailed progress of each project is given in the **Appendices 1 to 15** for Members' reference.

3. During the period 1 July to 31 December 2007, four research projects funded by ECF were completed. A summary of these projects in respect of its project schedule and total actual expenditure is given in **Table 2**. Detailed progress of each project is given in the **Appendices 16 to 19** for Members' reference.

Next Report

4. The Secretary will submit the next progress report in six months' time.

Secretariat, Research Projects Vetting Subcommittee
February 2008

Appendix 1

Project Number	4/2002 (Terminated)
Project Title	Diversity and Conservation of Bats in Hong Kong
Principal Investigator (PI)	Mr. William SUEN Kai-yuen of the Wildlife Conservation Foundation Limited
Project summary	To monitor various species of bats and the utilization rate of the bat boxes and study the effects of using bat houses for conservation of bats in Hong Kong. Educational programmes regarding the Hong Kong bat ecology for school teachers and students and the public will be organized.
Latest Progress	The Secretariat met the PI on 25.10.2007 and 20.12.2007. The PI finally provided an audited statement of account for the project.
Assessment/Remark	As the PI had provided all outstanding reports, the case was closed.

Appendix 2

Project Number	16/2003
Project Title	The use of biomarkers for ecotoxicological assessment of persistent organic pollutants (POPs) and heavy metals on birds at Mai Po Nature Reserve and other wetlands
Principal Investigator (PI)	Prof M H WONG of the Hong Kong Baptist University
Project summary	The major aim of the proposal is to investigate the potential use of feather and eggshells, instead of eggs, to setup and evaluate biomarkers in birds for risk assessment of POPs and heavy metals at Mai Po Marshes. If significant correlations can be established between the two (eggshells and feather, with eggs), future biomarkers can be performed on eggshells and/or feather, instead of eggs, which will be more convenient and less invasive.
Latest Progress	The PI submitted responses to AFCD and EPD in respect of their comments on the fifth progress report of the project. Pending any further comment from AFCD, the PI would submit the final report in due course.
Assessment/Remark	-

Appendix 3

Project Number	23/2004
Project Title	Towards developing an engineering strategy to reduce tire-pavement noise
Principal Investigator (PI)	Dr HUNG Wing-tat of the Hong Kong Polytechnic University
Project summary	<p>The objectives of this proposed research are as follows:</p> <ul style="list-style-type: none"> (a) to design and fabricate a trailer-based device employing the Close Proximity Method to measure the tire-pavement noise; (b) to conduct on-road tire-pavement noise surveys employing the trailer over selected low-noise pavement segments; (c) to conduct roadside traffic noise measurements over selected points along the road segments surveyed in (b) above; (d) to assess noise-reduction performance of various types of road pavements; (e) to evaluate the effects of different tire constructions and conditions on tire-pavement noise; and (f) to provide recommendations that facilitate the development of an engineering strategy to reduce tire-pavement noise.
Latest Progress	Comments on the final report by the independent evaluator had been forwarded to the PI. The PI subsequently revised the certification report accordingly. Final payment on the project would be processed in due course.
Assessment/Remark	-

Appendix 4

Project Number	25/2004
Project Title	Atmospheric Deposition of Mercury in Hong Kong
Principal Investigator (PI)	Dr. N. S. Duzgoren-Aydin of the University of Hong Kong
Project summary	<p>The primary objective of this project is to quantify atmospheric deposition of Mercury (Hg) in various parts of Hong Kong. Based on the collected information, the study will give insight to:</p> <ul style="list-style-type: none"> (a) rate of atmospheric Hg loading in the environment of Hong Kong; (b) spatial and seasonal variation(s) in atmospheric Hg deposition; (c) possible influences of cross-boundary transport of Hg; and (d) evaluate potential long-term ecological and human health impacts of atmospheric Hg in Hong Kong.
Latest Progress	The PI left the recipient organization without advance notice. A letter was sent to the Head of Department asking for his advice if the co-investigator would follow up the research. The Finance Office of the University of Hong Kong was also invited to provide finalized statement of account for the project.
Assessment/Remark	-

Appendix 5

Project Number	03/2005
Project Title	Species Identification, Ecology and Biological Control of Apple Snails in Hong Kong
Principal Investigator (PI)	Dr. Jian-wen QIU of the Hong Kong Baptist University
Project summary	<p>This project aims to:</p> <ul style="list-style-type: none"> (a) conduct an up-to-date and comprehensive survey of apple snails to determine the number of species present in Hong Kong, their distribution and environmental characteristics; (b) study the population dynamics of apple snails in different types of habitats; (c) determine their preference for local vegetables and natural hydrophytes, and the association between food preference and feeding rate, growth and reproduction; (d) assess the effects of apple snails on other freshwater gastropods; and (e) explore the use of a biological method in apple snail control.
Latest Progress	The third progress report for the period ending 30.10.2007 has been submitted. AFCD considered the progress satisfactory.
Assessment/Remark	It was noted in the financial report that there was over-expenditure on the budget item “general and miscellaneous”. The PI requested for virement of funds from the subhead “manpower” to cover the over-expenditure. Details are provided in ECF Paper 42/2007-2008 for Members’ consideration.

Appendix 6

Project Number	07/2005
Project Title	Study upon the Vegetation Effects and Potential Economic Habitat Management Benefits of Introducing Asian Water Buffalo <i>Bubalus bubalis</i> into the Freshwater Ponds at Mai Po Nature Reserve
Principal Investigator (PI)	Mr. Bena SMITH of World Wide Fund for Nature Hong Kong
Project summary	<p>The objectives of the project are:</p> <ul style="list-style-type: none"> (a) to investigate the impact of buffalo grazing upon the composition and structure of freshwater pond bankside and internal vegetation; (b) to investigate the impact of buffalo grazing upon avifauna; and (c) to undertake a comparison of the cost effectiveness of habitat management between buffalo and human methods.
Latest Progress	The third progress report for the period ending 8 July 2007 has been completed satisfactorily. Completion report to be prepared accordingly.
Assessment/Remark	-

Appendix 7

Project Number	09/2005
Project Title	Development of a novel and low-cost membrane bioreactor (MBR) for treating Hong Kong village sewage
Principal Investigator (PI)	Dr. Guang-hao CHEN of the Hong Kong University of Science & Technology
Project summary	The aim of the project is to develop a novel and low-cost MBR system for treating village sewage by using recycled non-woven materials as the membrane. The use of cheap membrane built from recycled non-woven materials with normal aeration strength enables development of an inexpensive, easy-to-operate, low-cost and small-scale MBR system suitable for use in village developments in Hong Kong.
Latest Progress	The first progress report was completed. The PI applied for an extension of the project to July 2008. Members commented on the variation of the project details including a shift of the pilot plant from a village house to the campus of HKUST.
Assessment/Remark	In response to Members' comments, the PI said that the composition of the sewage from the student halls reflects similar composition of the village housing sewage because the hall provides kitchens, showers, toilets and laundries that are the main facilities in village houses. The impact of varying flow rates on the plant performance will be examined during Phase III of the study.

Appendix 8

Project Number	06/2006
Project Title	To establish a three dimensional real-time marine environment monitoring system in Hoi Ha Wan Marine Park with connection to the internet
Principal Investigator (PI)	Dr. Robin BRADBEER of the City University of Hong Kong
Project summary	The objective of the project is to extend the existing 2-dimensional marine area monitoring system of the City University to a 3-dimensional monitoring system by adding two more data buoy units in the Hoi Ha Wan Marine Park. The work involves the setting up of a small DataBuoy I network to monitor 3 areas in the Hoi Ha Wan Marine Park. The data will be collected approximately once every minute and displayed at the Hoi Ha Visitor centre (on a Mimic Panel) and on the website of the City University.
Latest Progress	Pending on submission of progress report ending 30.11.2007.
Assessment/Remark	-

Appendix 9

Project Number	07/2006
Project Title	Mechanism of the elevated algal proliferation in intertidal shrimp ponds (gei wais) of the Mai Po Nature Reserve
Principal Investigator (PI)	Dr. Ji-dong GU of the University of Hong Kong
Project Summary	<p>The purposes of this project are:</p> <p>(a) to conduct an intensive on-site investigation to identify the environmental condition(s) responsible for the active algal proliferation and elevation of organic contents in gei wais as compared with open marine and fresh waters;</p> <p>(b) to investigate the potential effect of suspended solids on algal growth in gei wais with matrix experiments; and</p> <p>(c) to substantiate the role of sediments as a sink-and-source of pollutants in association with the water quality of gei wais with simulation experiments.</p>
Latest Progress	The project commenced in March 2007. Progress report for the period ending August 2007 would be submitted in due course.
Assessment	-

Appendix 10

Project Number	08/2006
Project Title	A Study of the Impact of Apple Snails on Macrophytes, Nutrients and Chlorophyll in Local Wetlands
Principal Investigator (PI)	Dr. Jian-wen QIU of the Hong Kong Baptist University
Project Summary	The objectives of the study are: (a) to quantify the feeding of apple snails on local wild macrophytes; (b) to examine the plant traits that determine the food preference in apple snails; and (c) to assess the consequences of such destruction in wetland plant diversity, nutrient level and algal biomass.
Latest Progress	The project commenced on 1.8.2007. Progress report would be submitted in due course.
Assessment/Remarks	-

Appendix 11

Project Number	10/2006
Project Title	Association of other waterbird species with wintering Black-faced Spoonbills <i>Platalea minor</i> in Hong Kong
Principal Investigator (PI)	Dr. CHEUNG Ho-fai of the Hong Kong Bird Watching Society Ltd.
Project summary	The goal of the project is to identify the relationships and the kind of relations between wintering Black-faced Spoonbills and other waterbirds in Hong Kong. Field observations will be conducted in winter months, when the wintering Black-faced Spoonbills arrive at Mai Po, i.e. from November, and finished when the spoonbills start the northward migration, i.e. end of February. Study area would include Mai Po Inner Deep Bay Ramsar site and the peripheral area where the spoonbills would occur.
Latest Progress	The project commenced on 1.11.2007.
Assessment/Remark	-

Appendix 12

Project Number	13/2006
Project Title	Sustainable Energy: survey on electricity consumption habits and energy saving perception of Hong Kong residential users
Principal Investigator (PI)	Mr. CHU Hon-keung of the Friends of the Earth (HK) Charity Ltd.
Project summary	The project aims to investigate the awareness and behaviour pattern of Hong Kong residential users towards energy consumption by means of telephone interview; and to promote and examine possible ways of energy saving which in turn reduce greenhouse gas emissions and improve air quality.
Latest Progress	The project commenced on 1.10.2007.
Assessment/Remark	The PI applied for deferral of project completion date from 12 February to 12 March 2008 without additional funds. Details are given in ECF Paper 42/2007-2008 for Members' consideration.

Appendix 13

Project Number	1/2007
Project Title	A Survey of Light Pollution in Hong Kong
Principal Investigator (PI)	Dr. Chun-shing Jason PUN of the University of Hong Kong
Project summary	<p>This project consists of three components:</p> <ul style="list-style-type: none"> (a) night sky brightness data will be taken across Hong Kong over a one-year period using a simple and portable device called the Sky Quality Meter (SQM), around 30 groups of contributors pledged to participate in the data collection campaign; (b) a public webpage will be set up to serves both as a data input and reporting interface, and an educational resource for the general public about the issue of light pollution; and (c) the data reported by all observers will be analyzed to generate a map of the night sky brightness level in Hong Kong. The results will be released to the public through the webpage.
Latest Progress	The project commenced on 1.11.2007.
Assessment/Remark	-

Appendix 14

Project Number	4/2007
Project Title	Stock and Ecological Status of Sea Urchins in Hong Kong: Evaluation of the Effectiveness of Marine Protected Areas Using Sea Urchins as Model Organisms
Principal Investigator (PI)	Dr. Tak-cheung WAI of the University of Hong Kong
Project summary	<p>The objectives of the study are</p> <ul style="list-style-type: none"> (a) to conduct a comprehensive literature review of the diversity, abundance, distribution and habitat preference of echinoderm species in the Hong Kong marine environment; (b) to conduct underwater surveys to investigate the diversity, abundance, distribution and habitat preference of commercially exploited species (<i>Anthocidaris crassispina</i>), and other urchin species in rocky, coral and sandy habitats; and (c) to conduct an ecological study to test the hypothesis that the number of size classes (i.e. size range) and abundance of urchin populations within MPAs are higher than those unprotected outside MPAs.
Latest Progress	The ECF Committee approved the project at the meeting held on 8.11.2007. The PI agreed to commence the project on 1.4.2008. Initial payment to be settled nearer the time.
Assessment/Remark	-

Appendix 15

Project Number	6/2007
Project Title	Investigation on the feasibility and enhancement methods of wind power utilization in high-rise buildings of Hong Kong
Principal Investigator (PI)	Dr. Lu Lin, Vivien of the Hong Kong Polytechnic University
Project summary	<p>The objectives of the study are</p> <ul style="list-style-type: none"> (a) to investigate the wind aerodynamics and wind flows over the buildings in the urban areas; and to evaluate local wind power; (b) to address the strategies how to develop wind power in local urban areas more effectively; (c) to investigate and propose the optimal roof shape in favor of wind power application; (d) to study the buildings as a concentrator of the wind for the Building Augmented Wind Turbines (BAWT); and to propose the utilization of the concentration effect of buildings; and (e) to provide informative data for concerned parties.
Latest Progress	The ECF Research Projects Vetting Subcommittee approved the project at the meeting held on 7.12.2007. The PI agreed to commence the project on 1.3.2008.
Assessment/Remark	-

Appendix 16

Project Number	12/2003 (Completed)
Project Title	Conservation of Horseshoe Crabs in Hong Kong
Principal Investigator (PI)	Dr. CHEUNG Siu-gin & Dr Paul SHIN of the City University of Hong Kong
Scope of study	The project is divided into 2 stages. Stage 1 involves the update of status of horseshoe crab population in Hong Kong, assessment of human exploitation of horseshoe crabs locally, and trial on artificial insemination and breeding of local horseshoe crabs. If the trial is successful and juveniles can be reared in the laboratory, the PI will seek approval for implementing a full-scale restocking programme at stage 2.
Summary of findings	From a territory-wide survey of 17 shores, juvenile <i>Tachypleus tridentatus</i> were present on 11 shores on the west/northwest whereas <i>Carcinoscorpius rotundicauda</i> were found at 3 shores on the west/northwest and 1 shore on the northeast of Hong Kong. As compared to a similar study in 2002, a decline in juvenile <i>T. tridentatus</i> populations was apparent. Morphologically, <i>T. tridentatus</i> and <i>C. rotundicauda</i> were significantly different in various ratios of body parts. However, for phylogenetic comparison, the inter-specific variations of 18S and 28S rDNA sequence were very small. Both juvenile <i>T. tridentatus</i> groups with 1 and 3 immovable spines on the dorsal surface of the opisthosoma were also genetic closer to <i>C. rotundicauda</i> but morphologically closer to adult <i>T. tridentatus</i> . Other genetic sequences are thus needed to ascertain their identity. For human exploitation, the sale of horseshoe crabs was low compared to other commercial marine species. There was, however, a seasonal trend in demand. Education to discouraging the public to keep/consume horseshoe crabs will be necessary to protect the existing populations in local waters. It was also successful in artificially breeding of juvenile horseshoe crabs with optimal hatching temperature and salinity, but high mortality of the juveniles remained a difficulty to overcome.

Appendix 17

Project Number	6/2004 (Completed)
Project Title	Ecological and Physiological Response of Hong Kong Coral Communities to Changing Temperature and Oxygen Level
Principal Investigator (PI)	Prof. David RANDALL and Dr Paul SHIN of the City University of Hong Kong
Scope of study	The aim of the project is to study the behavioural and physiological responses of local corals and their associated reef fish communities in Hoi Ha Wan Marine Park with respect to changing environmental factors, especially dissolved oxygen, salinity and temperature.
Summary of findings	<p>Conditions of corals were assessed by means of their colour change and polyp contraction/relaxation. The three coral species, namely <i>Platygyra spp.</i>, <i>Favia rotumana</i> and <i>Goniopora columnia</i>, showed similar colour change response to a decrease in temperature to ~ 17°C but reacted differently when temperature increased up to ~ 29°C.</p> <p>The present study also showed a seasonal variation of fish abundance on a subtropical reef with water temperature changes from 29°C in summer to 17°C in winter. Mean maximum number of species during daylight in warmer months was ~10-12 while that in colder months decreased to 2-3. September 2005 and April 2006 can be considered as ‘turning points’ between the summer and winter fish abundance. Neap tide has been shown to have a profound effect on fish abundance in winter whereas spring tide has a profound effect in summer fish abundance. Such tidal effect was greater than the seasonal effect in structuring the fish species number and density.</p> <p>The present coral bleaching study provided baseline data of monthly coral colour change of three common species for one year. This will help to identify the potential coral bleaching season which needs to be paid attention to. Human activities in marine parks during bleaching events may need to be reduced or suspended to relief the pressure on coral communities.</p>

	<p>The present study has provided partial information of the Essential Fishery Information. These are (1), spatial and temporal abundance of fish and (2), movement pattern of fish. Management measures for a sustainable fish assemblage in Hoi Ha Wan were recommended.</p>
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Appendix 18

Project Number	8/2004 (Completed)
Project Title	Development of pre-bloom fluorimetric assays for the monitoring of harmful algal blooms
Principal Investigator (PI)	Dr. Joseph Tin-yum WONG of the Hong Kong University of Science and Technology
Scope of study	The proposal aims to develop an array of combinatory micro-fluorimetric assays, that are based on the detection of agents that modulate membrane potential, intracellular calcium and sodium ions. As the vast majority of algal toxins involved in harmful algal blooms (HABs) belong to such modulation agents, and their assays require only a small amount of algal materials and a short sample preparation time, a combinatory micro-fluorimetric assay would generate timely information before the actual bloom is formed.
Summary of findings	Most known algal toxins act on ion channels either directly or indirectly, resulting in a change in intracellular ion concentrations when administered to targeted cells. The project developed the working conditions for the use of fluorescent dyes in monitoring changes in membrane potential, intracellular calcium, and intracellular sodium levels in mammalian cell lines. Using these conditions, specific changes in fluorescent signals in response to several purified toxins were demonstrated. Using a very simple extraction procedure, algal extracts from several local and non-local species were generated. These extracts, when administered to the developed fluorimetric assays, were able to elicit different pattern of changes in membrane potential, intracellular calcium, and intracellular sodium levels. Algal extracts from natural seawater samples were also assayed. During non-bloom conditions, only very minor responses were observed in the fluorimetric assays. However, a seasonal pattern was detected. In summary, the project established the basic working conditions for using fluorimetric assays to monitor mixed species in seawater samples. The differential pattern of responses induced by the different algal toxins in the three fluorimetric assays serve as a proof of concept for the use of fluorimetric assays in the monitoring of algal blooms.

Appendix 19

Project Number	04/2005 (Completed)
Project Title	Capacity building – identifying the missing links: developing the model for future community-operated renewable energy (BIPV) project
Principal Investigator (PI)	Dr. Josie CLOSE of the University of Hong Kong
Scope of study	<p>The project has the following purposes:</p> <p>(a) to identify the learning curve and areas of necessary capacity building to ensure the successful take-up (operation) by the community of renewable energy applications beyond research or demonstration projects in order to create the Model for future projects; and</p> <p>(b) to design and specify an appropriate low-cost BIPV monitoring system for general applications.</p>
Summary of findings	<p>This project has overlapped with international attention on climate-change, the need for reduced CO2 emissions and opportunities for clean, renewable energy (RE) technologies to ameliorate climate-change effects. The Questionnaire responses were revealing. ETWB (Works) Circular 16/2005 promotes RE applications as capital and retro-fit projects but is unknown in the private sector and demonstration projects' achievements in overcoming some critical barriers are also unknown. Utilities are regarded as unsupportive and government as lacking leadership. There was very wide appreciation that education and training was needed to increase all sectors' knowledge and the expectation was widely expressed that government should take the lead ie programmes, funding, incentives, accredited training, published information. The General Stakeholder Workshop was particularly rewarding with the business initiatives identified in the Partnering Model developed during discussions. The potential business partnering arising from RE applications was appreciated as job creation/economy boosting resulting goods and services at reduced costs. Missing</p>

	links were identified as the rise of distributed energy generation (combining RE application with CHP/tri-generation), a dedicated independent organization to focus activities and the impetus derived from a high-profile local champion. All those would be additional benefits but the Partnership (business) Model and the Bottom-up (community focus) Model were identified as presently operable.
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