RGC Ref. No.:
UGC/FDS12/M01/15
(please insert ref. above)

**RESEARCH GRANTS COUNCIL**
**COMPETITIVE RESEARCH FUNDING SCHEMES FOR**
**THE LOCAL SELF-FINANCING DEGREE SECTOR**

**FACULTY DEVELOPMENT SCHEME (FDS)**

**Completion Report**
*(for completed projects only)*

***Submission Deadlines:***
1. *Auditor's report with unspent balance, if any: within **six** months of the approved project completion date.*
2. *Completion report: within **12** months of the approved project completion date.*

## Part A: The Project and Investigator(s)

### 1. Project Title

A comparative study of the bird communities in urban parks of Hong Kong in 1996 and 2016

### 2. Investigator(s) and Academic Department(s) / Unit(s) Involved

| Research Team | Name / Post | Unit / Department / Institution |
|---|---|---|
| Principal Investigator | LOCK Nga Yi / Assistant Professor (until March 2019) | Science and Mathematics Domain / Centennial College |
| Co-Investigator(s) | | |
| Others | | |

### 3. Project Duration

| | Original | Revised | Date of RGC / Institution Approval *(must be quoted)* |
|---|---|---|---|
| Project Start Date | 01-01-2016 | | |
| Project Completion Date | 30-04-2018 | 31-10-2018 | 16-04-2018 |
| Duration *(in month)* | 28 | 34 | |
| Deadline for Submission of Completion Report | 30-4-2019 | 31-10-2019 | |

## Part B: The Final Report

## 5. Project Objectives

5.1 Objectives as per original application

1. To describe the bird communities of six major urban parks in Hong Kong in 2016;

2. To identify breeding bird species and to estimate breeding density of individual species in six major urban parks in Hong Kong in 2016;

3. To identify the major patterns of changes in bird communities of these six urban parks by comparing the data obtained in 1996 and 2016;

4. To correlate the changes in bird communities with environmental factors, including the coverage of different vegetation types and tree species, park management and other factors observed; and

5. To provide recommendation for the design and management of urban parks in Hong Kong to enhance their wild bird diversity.

5.2 Revised objectives

Date of approval from the RGC: N.A.

Reasons for the change: N.A.

5.3 Realisation of the objectives
*(Maximum 1 page; please state how and to what extent the project objectives have been achieved; give reasons for under-achievements and outline attempts to overcome problems, if any)*

The research objectives as per the original application have been achieved fully. In order to address objectives 1, 2 and 3, the following bird surveys were conducted in 2016. (1) Bird communities of the six study sites have been studied twice a month by transect counts from January to December 2016. A total of 144 bird surveys (6 sites x 24 visits) were done. (2) Territory mapping method has been used to study the breeding bird communities from March through July in 2016, and therefore, a total of 60 breeding bird surveys (6 sites x 10 visits) were conducted.

In order to address objectives 3 and 4, plant surveys (tree and shrub) were conducted and plant data were also collected from various sources. Data of bird surveys, tree surveys and shrub surveys have been inputted for analysis. In order to address objective 5, the data collected have been analyzed. The results of the data analysis generated recommendations for the design and management of urban parks. In order to fully address objectives 1 to 5, a manuscript for publishing at a peer-reviewed journal is under preparation.

5.4 Summary of objectives addressed to date

| **Objectives** *(as per 5.1/5.2 above)* | **Addressed** *(please tick)* | **Percentage Achieved** *(please estimate)* |
|---|---|---|
| 1. To describe the bird communities of six major urban parks in Hong Kong in 2016 | √ | 100% |
| 2. To identify breeding bird species and to estimate breeding density of individual species in six major urban parks in Hong Kong in 2016 | √ | 100% |

| | | |
|---|---|---|
| 3. To identify the major patterns of changes in bird communities of these six urban parks by comparing the data obtained in 1996 and 2016 | √ | 100% |
| 4. To correlate the changes in bird communities with environmental factors, including the coverage of different vegetation types and tree species, park management and other factors observed | √ | 100% |
| 5. To provide recommendation for the design and management of urban parks in Hong Kong to enhance their wild bird diversity | √ | 100% |

## 6. Research Outcome

6.1 Major findings and research outcome
*(Maximum 1 page; please make reference to Part C where necessary)*

**To describe the bird communities of six major urban parks in Hong Kong in 2016**
The bird communities were studied by transect counts twice a month from January through December 2016. A fixed transect route was selected in each of the six urban parks, including Hong Kong Park, Kowloon Park, Sha Tin Park, Penfold Park, Tuen Mun Park and Yuen Long Park. Each transect was started at 6:30 a.m. and completed in about two hours, except for Penfold Park. A total of 74 species were recorded in the six parks in 2016. Resident species dominated the species list, followed by winter visitors and passage migrants; while summer visitor accounted for a small proportion of species.

**To identify breeding bird species and to estimate breeding density of individual species in six major urban parks in Hong Kong in 2016**
Territory mapping method was applied to study the breeding bird communities from March through July 2016 in these six parks, and altogether 60 breeding bird surveys (6 sites x 10 visits) were conducted. Fourteen species were recorded as proven breeders (i.e. for which a nest being used by breeding birds were located, or a bird was seen carrying food). A total of five species were probable breeders (juvenile birds were seen accompanied by a parent, or a bird was seen carrying nest materials).

**To identify the major patterns of changes in bird communities of these six urban parks by comparing the data obtained in 1996 and 2016**
The bird data collected in 2016 was compared to the 1996 data and the bird communities had undergone perceptible changes. There is an increase in the abundance of several local forest bird species, such as Great Tit and Yellow-browed Warbler, which may be attributed to the growth of trees and development of woodland habitat in urban parks with time.

**To correlate the changes in bird communities with environmental factors, including the coverage of different vegetation types and tree species, park management and other factors observed**
The PI's 1996 study found that the three parks with preserved old trees have higher bird diversity then young parks. The bird species richness of the three "young parks", i.e. Penfold Park, Sha Tin Park and Tuen Mun Park, has increased after 20 years but not in the other 3 parks. It may be attributed to the growth of trees, which provided more resources for birds. On the other hand, the Eurasian Tree Sparrow, which is the dominant granivorous species and feed mostly on supplementary food from park visitors, decreased in abundance in the urban parks, which may be attributed to bird feeding has been prohibited since the outbreak of avian influenza and the severe acute respiratory syndrome (SARS) in Hong Kong in 2003.

**To provide recommendation for the design and management of urban parks in Hong Kong to enhance their wild bird diversity**
A number of recommendations generated after date analysis conducted. For instance, the bird species richness on islands in water bodies in the parks have increased after 20 years. It is recommended an island should be provided if the water body is large enough. The data collected in this study serves as a historical record for future research on the impact of humans on environment. The results of the study generated recommendations for the design and management of urban parks.

*6.2* Potential for further development of the research and the proposed course of action *(Maximum half a page)*

The data of plant community and vegetation structure could be analyzed further to explore the correlation of bird community and landscape species in parks and provide recommendation for eco-friendly design of urban parks.

For comparative purpose, findings of this project can be compared with urban bird communities between Asian countries.

## 7. Layman's Summary

*(Describe in layman's language the nature, significance and value of the research project, in no more than 200 words)*

This is the first study in Hong Kong to investigate the temporal changes in urban bird communities. To allow for a fair comparison of bird communities, the study areas, survey methods and survey efforts adopted were the same as an earlier study conducted 20 years ago. The bird data collected in 2016 have been compared to the 1996 data and it was shown that their bird communities had undergone perceptible changes, such as increase in the abundance of several local forest bird species in the urban parks, which may be attributed to the growth of trees and development of woodland habitat in urban parks with time. Also, the dominant granivorous species, which fed mostly on supplementary food from park visitors, decreased in the abundance in the urban parks, where bird feeding has been prohibited since the outbreak of avian influenza and the severe acute respiratory syndrome (SARS) in Hong Kong in 2003. The data collected in this study is not only useful to understand the current situation of urban bird communities, but also serves as a historical record for future research focusing on the impact of humans on their environment. The results of the study generated recommendations for the design and management of urban parks.

## Part C: Research Output

**8. Peer-Reviewed Journal Publication(s) Arising Directly From This Research Project**
*(Please attach a copy of the publication and/or the letter of acceptance if not yet submitted in the previous progress report(s). All listed publications must acknowledge RGC's funding support by quoting the specific grant reference.)*

| **The Latest Status of Publications** | | | | **Author(s)** *(denote the corresponding author with an asterisk*)* | **Title and Journal / Book** *(with the volume, pages and other necessary publishing details specified)* | **Submitted to RGC** *(indicate the year ending of the relevant progress report)* | **Attached to this Report** *(Yes or No)* | **Acknowledged the Support of RGC** *(Yes or No)* | **Accessible from the Institutional Repository** *(Yes or No)* |
|---|---|---|---|---|---|---|---|---|---|
| **Year of Publication** | **Year of Acceptance** *(For paper accepted but not yet published)* | **Under Review** | **Under Preparation** *(optional)* | | | | | | |
| | | | | | | | | | |

**9. Recognized International Conference(s) In Which Paper(s) Related To This Research Project Was / Were Delivered**
*(Please attach a copy of each conference abstract)*

| **Month / Year / Place** | **Title** | **Conference Name** | **Submitted to RGC** *(indicate the year ending of the relevant progress report)* | **Attached to this Report** *(Yes or No)* | **Acknowledged the Support of RGC** *(Yes or No)* | **Accessible from the Institutional Repository** *(Yes or No)* |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |

*Reason for not attending an international conference:*
In the second half of the project duration period the PI was stressed out by a family member's terminal illness, which had impacted adversely on the PI's stamina in conducting the research. As the PI needed to take care the family member in the final stage of his life, she had difficulties to leave Hong Kong to attend any international conference. The PI's family member passed away closed to the end of her project duration period.

**10. Whether Research Experience And New Knowledge Has Been Transferred / Has Contributed To Teaching And Learning**

Since the PI has taught subjects on global ecosystem, natural resources and conservation, the research findings have been contributed to the teaching and learning. These local latest findings have been provided to students as local examples.

**11. Student(s) Trained**
*(Please attach a copy of the title page of the thesis)*

| Name | Degree Registered for | Date of Registration | Date of Thesis Submission / Graduation |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

**12. Other Impact**
*(e.g. award of patents or prizes, collaboration with other research institutions, technology transfer, teaching enhancement, etc.)*

**13. Statistics on Research Outputs**

| | Peer-reviewed Journal Publications | Conference Papers | Scholarly Books, Monographs and Chapters | Patents Awarded | Other Research Outputs (please specify) | |
|---|---|---|---|---|---|---|
| **No. of outputs arising directly from this research project** | | | | | Type | No. |
| | | | | | | |

## 14. Public Access Of Completion Report

*(Please specify the information, if any, that cannot be provided for public access and give the reasons.)*

| Information that Cannot Be Provided for Public Access | Reasons |
|---|---|
| N.A. | N.A. |

**RESEARCH GRANTS COUNCIL**
**COMPETITIVE RESEARCH FUNDING SCHEMES FOR THE LOCAL SELF-FINANCING DEGREE SECTOR**

**FACULTY DEVELOPMENT SCHEME (FDS)**

**Completion Report - Attachment**
*(for completed projects only)*

| | |
|---|---|
| **RGC Ref. No.:** | UGC/FDS12/M01/15 |
| **Principal Investigator:** | LOCK Nga Yi |
| **Project Title:** | A comparative study of the bird communities in urban parks of Hong Kong in 1996 and 2016 |

**Statistics on Research Outputs**

| | Peer-reviewed Journal Publications | Conference Papers | Scholarly Books, Monographs and Chapters | Patents Awarded | Other Research Outputs (Please specify) |
|---|---|---|---|---|---|
| No. of outputs arising directly from this research project [or conference] | 0 | 0 | 0 | 0 | 0 |