



WPI



CALENDARS

Co-production of Seasonal Representations
for Adaptive Institutions

Investigating Seasonal Changes in Hong Kong Beekeeping





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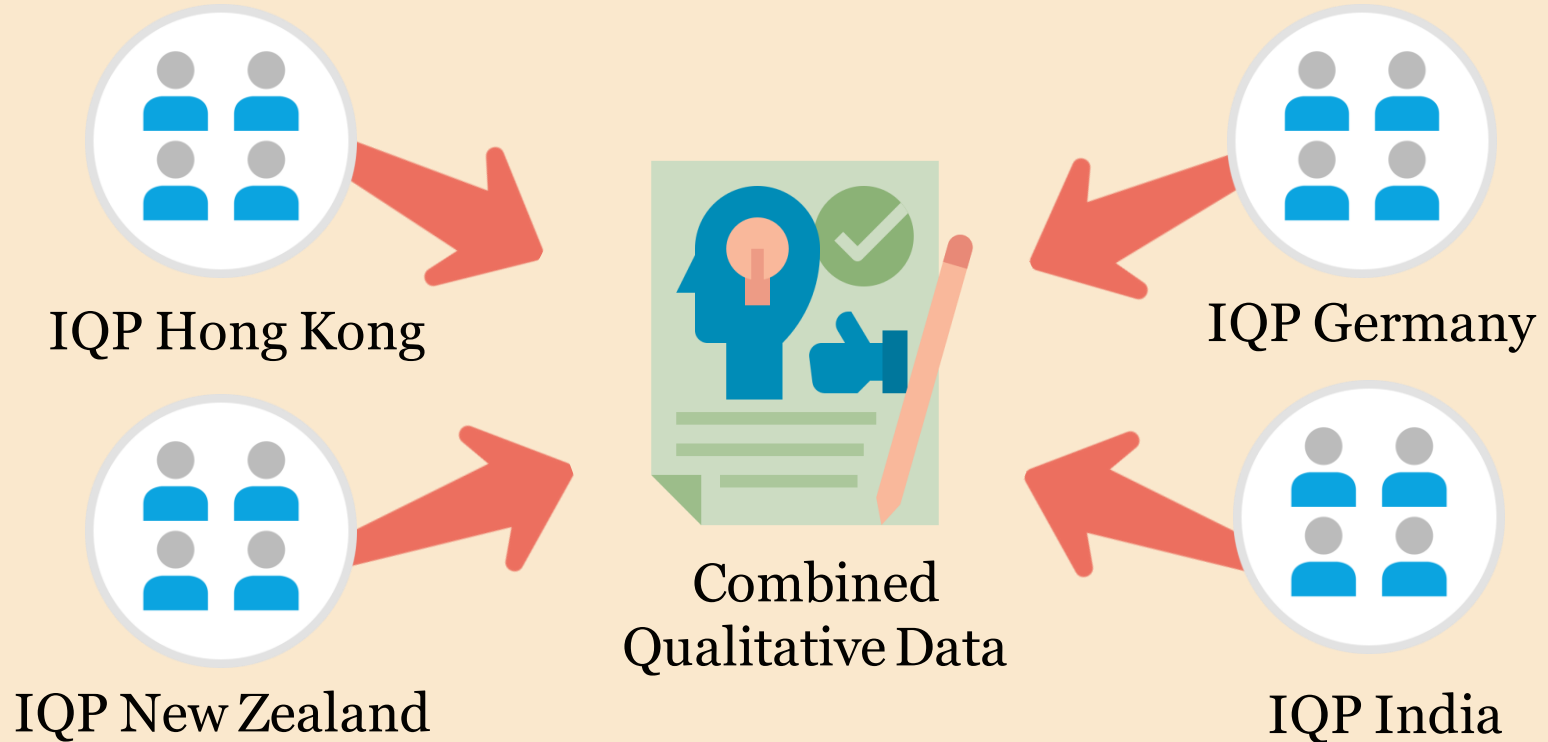


CALENDARS

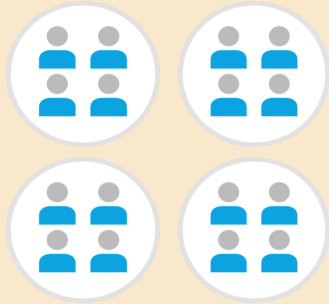
Co-production of Seasonal Representations
for Adaptive Institutions



CAL IQP Research Collaborative



CAL IQP Research Collaborative



WPI IQP
Groups



Combined
Qualitative
Data

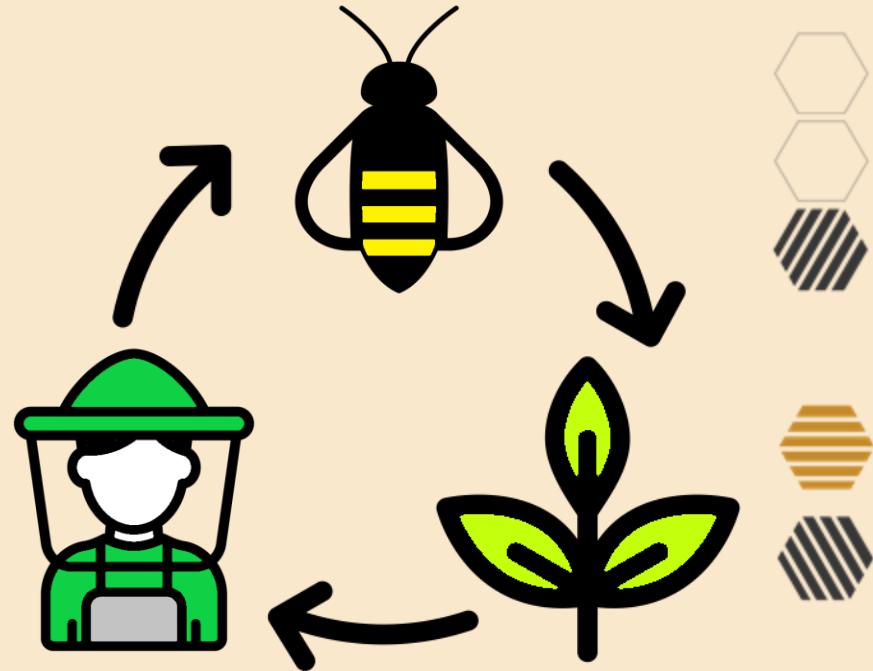


Further
Research Beyond
IQP Project

Importance of Bees



**~1/3rd of
the entire
world's food
supply
depends on
pollinators**





Our Project

1. What is a seasonal year for beekeepers? What are the typical activities, practices, and technologies important for successful beekeeping?
2. What challenges are beekeepers facing and how do they adapt?
3. What will the future of beekeeping look like in Hong Kong?

Objectives



Characterise apiculturist perceptions of seasons in Hong Kong



Enhance 2022 IQP CALENDAR tool



Create an ArcGIS StoryMap as an educational reference

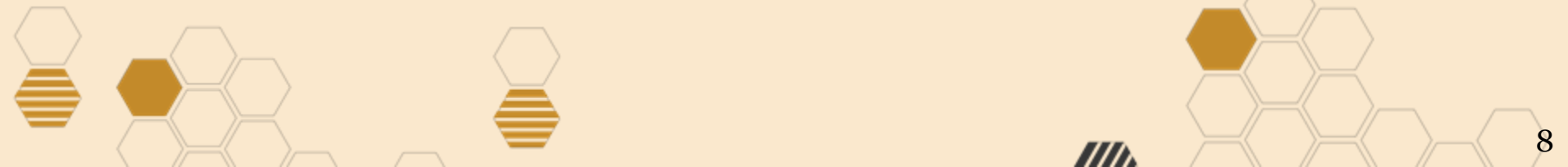
1

Characterise Apiculturist Perceptions of Seasons in Hong Kong

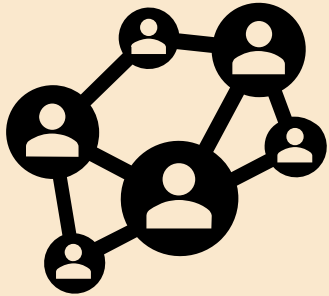
Seasonal changes in organisms' lifecycle activities

Limited published information

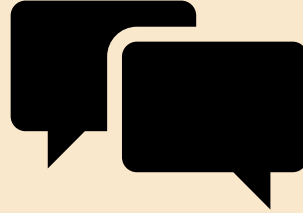
Underrepresented perspectives & valuable observational knowledge



Methods



Networking



Interviews



Thematic Analysis



Challenges

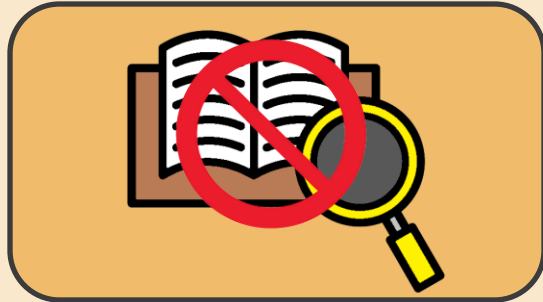
No Established Reputation



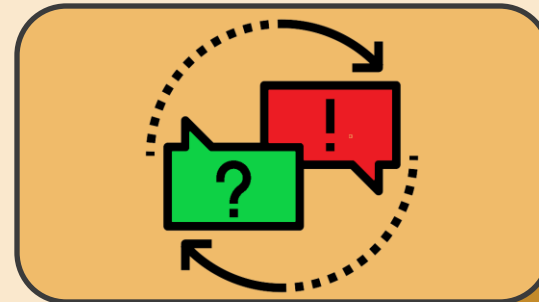
Interview Bias



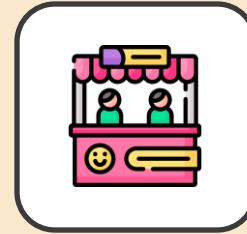
Not Well-Researched Topic



Language & Translations



Networking



Pop-up Shops



Online Forums



Social Media

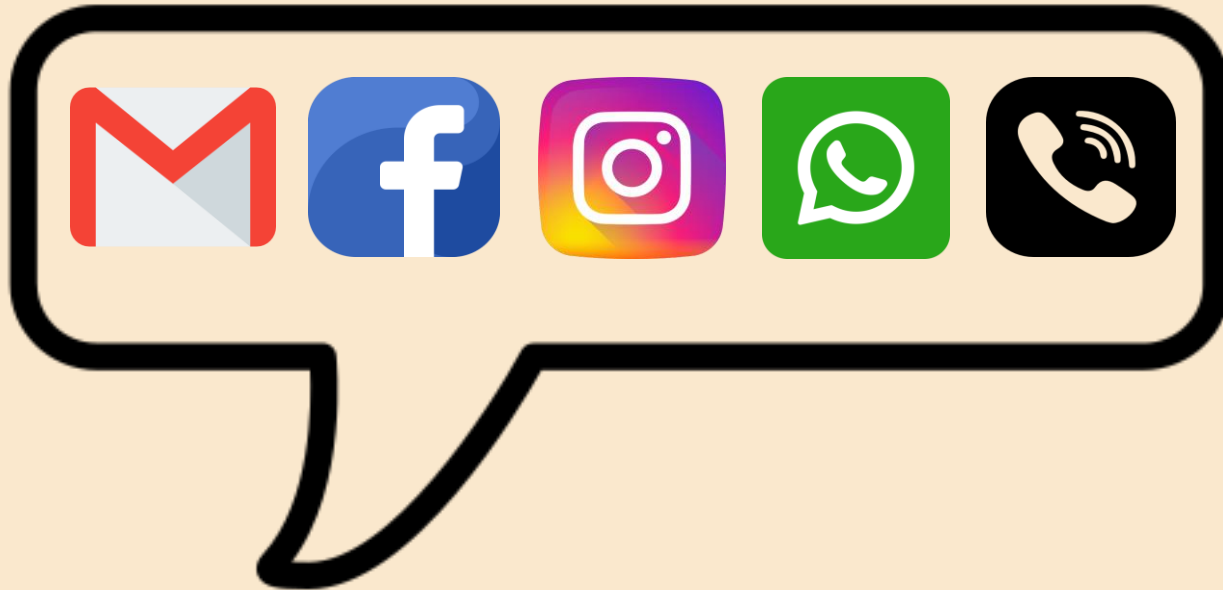
Easily Found Online



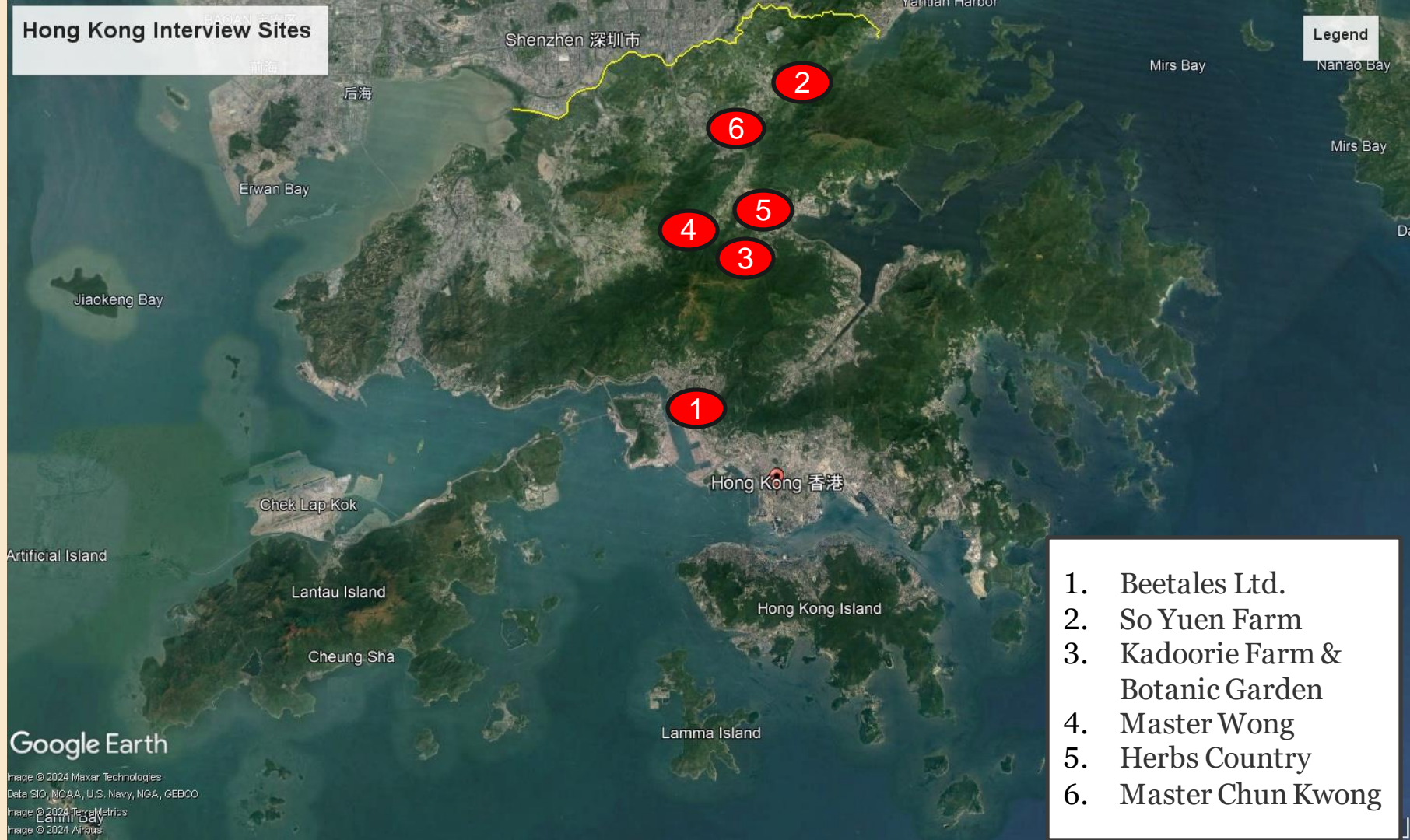
Diving Deeper



Forms of Communication



Hong Kong Interview Sites



Legend

1. Beetales Ltd.
2. So Yuen Farm
3. Kadoorie Farm & Botanic Garden
4. Master Wong
5. Herbs Country
6. Master Chun Kwong

Google Earth

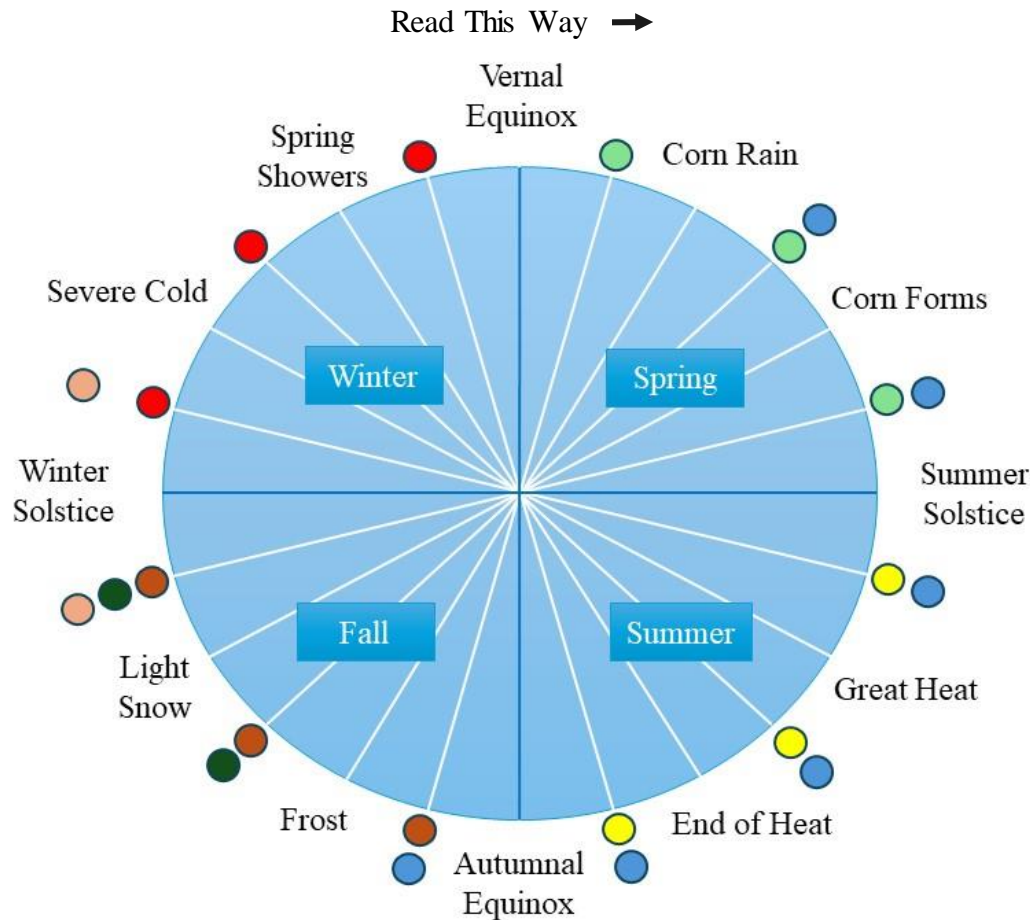
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Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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Sample Interview Questions

1. Where do you source knowledge and training as a beekeeper?
2. What is a year of beekeeping like for you? Identify seasons/activities within practice



Combined Perceptions of Beekeeping Seasons



- Fall
- Additional Food Supply
- Bees may show signs of illness
- Ivy Tree Honey Production
- Lychee Tree Honey Production
- Rainy Season
- Summer

Key Observations

- Beekeeping seasons & practices in a year are dependent on the behaviour and activity of bees
- Beekeepers rarely create formal forecast
- Beekeepers' schedules are a reaction to conditions of their environment (regular hive inspections)



Practices Are Dependent Upon the Direct Environment



3

Kadoorie Farm and Botanical Garden



5

Herbs Country Farm



Understanding Practices of Beekeeping

Geographic
Location

Climate

Sources of
Knowledge

Environmental
Resources



The slide features a light beige background with decorative hexagonal patterns in the corners. In the top-left, there is a solid orange hexagon above two outlined hexagons. In the top-right, there is a cluster of outlined hexagons and a small group of three hexagons, one of which is filled with horizontal orange stripes. In the bottom-left, there is a large cluster of outlined hexagons, one of which is filled with diagonal black stripes, and a small solid orange hexagon at the very bottom. In the bottom-right, there is a small group of three outlined hexagons, one of which is filled with horizontal orange stripes.

Challenges



Pesticides

- Contaminate water sources (especially urban)
- Make bees susceptible to illness



Viruses & Bacteria



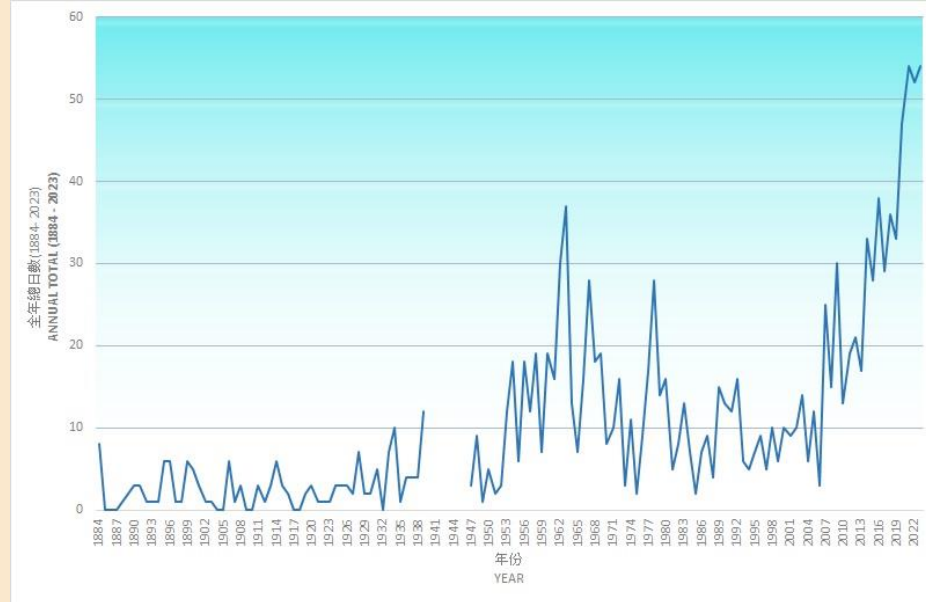
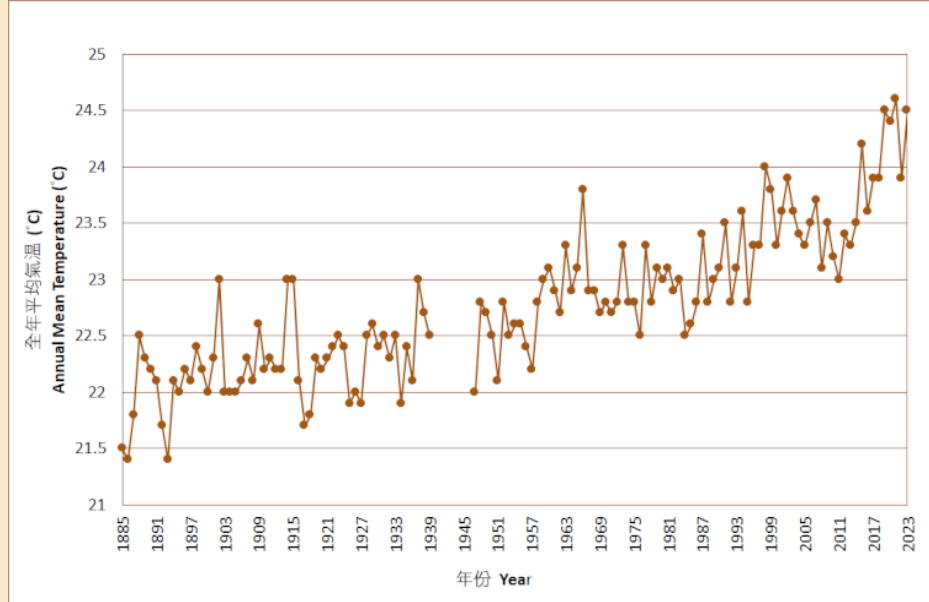
Symptoms of Climate Change



- Increased extreme weather frequency
 - Typhoons, rainfall, flooding, winds,...
- Changes in temperature across seasons
 - Shifts in blooming seasons
 - Can lengthen presence of predators
 - Conditions make bees more susceptible to viruses



Observations Align With Quantitative Data



*The years 1940-1946 are excluded due to suspension of Observatory services during WWII

Adaptations To:

Extreme Temperature Fluctuation



Adaptation To:

Inconsistent Food &
Water Supply



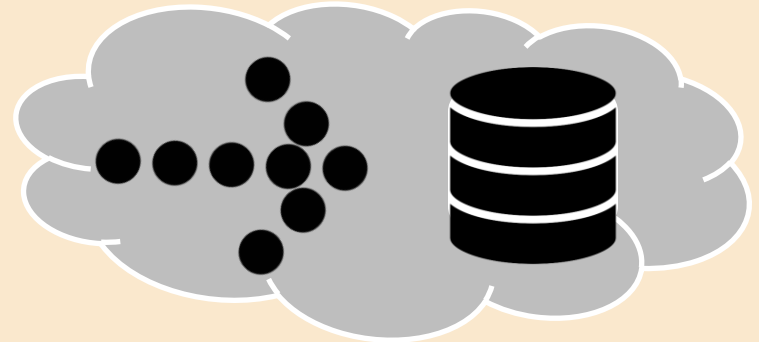
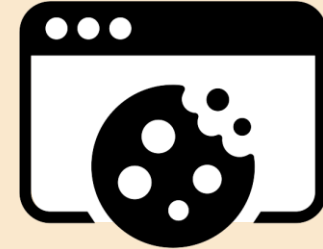
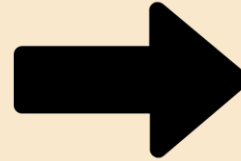


Other Adaptations:



2

Enhance 2022 IQP CALENDAR Tool





Create an ArcGIS StoryMap as an Educational Reference



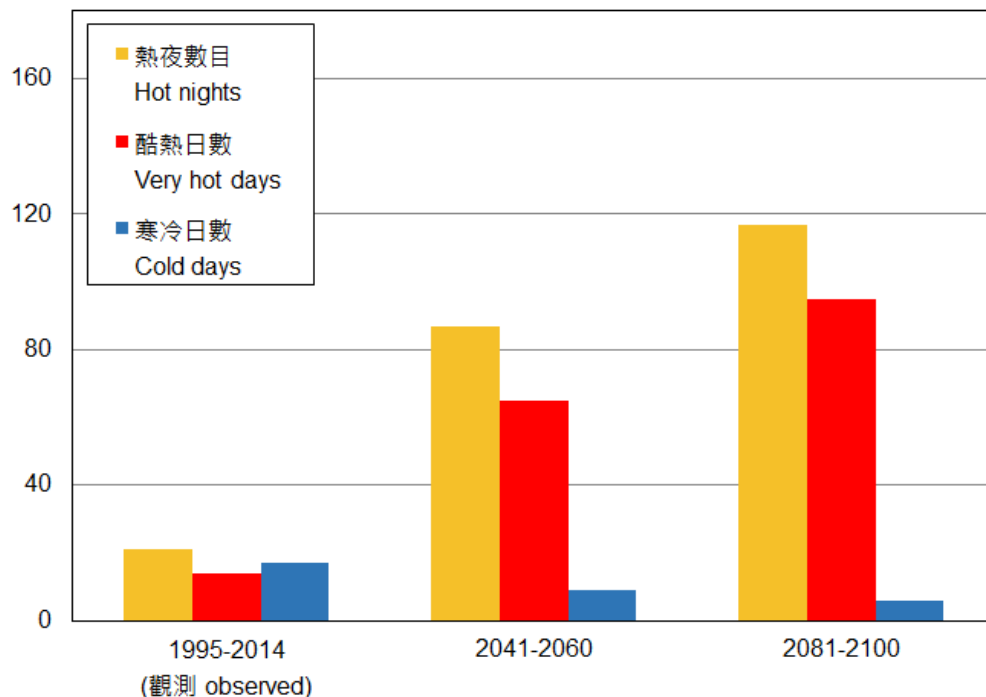
Bee Bold: Strategies for Hong Kong Beekeeping

Bee Bold: Strategies for Hong Kong Beekeeping

Samantha Arroyas, Sophia Bogartz, Nathan Dynko, Jack O'Connell
Draft



The Future of Beekeeping



在中溫室氣體排放情景 (SSP2-4.5) 下，香港每年熱夜數目、酷熱日數和寒冷日數的未來推算
Projected annual number of hot nights, very hot days and cold days in Hong Kong
under the intermediate greenhouse gas emissions scenario (SSP2-4.5)



Acknowledgements

We would like to credit and dedicate this project to the beekeepers who made it possible:

Beetales Ltd.
So Yuen Farm
Kadoorie Farm &
Botanic Garden

Master Wong
Herbs Country
Master Chun Kwong

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Additional thanks to Professor Sarah Strauss as sponsor
CALENDARS Research Group Liaison



The slide features a light beige background with decorative hexagonal patterns in the corners. The top-left and bottom-right corners have clusters of light grey outlined hexagons. The top-right and bottom-left corners have clusters of light grey outlined hexagons with some hexagons filled with solid colors: a striped orange hexagon, a solid orange hexagon, and a striped black hexagon.

Thank You!

Questions?