BEC Project Supplement

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General Interview Questions

Interview Questions for Businesses

1. Introduction
    - 1.1. What does your organisation do/what is the overall goal?
    - 1.2. Please tell us a little bit about your role in your organisation.
    - 1.3. What sustainability projects have you worked on for the organisation/company?

2. Climate Change Impact and Nature Risks
    - 2.1. Have you or your business been impacted by climate change?
    - 2.2. What problem did you aim to address, and who was the target audience?

3. Definition and Role of NBS
    - 3.1. How would you define the term NBS?
    - 3.2. What roles do NBS play in your company?
    - 3.3. What currently interests you about the application of NBS?
    - 3.4. Where did you first hear about NBS? Was it from another business or an NGO?
    - 3.5. What is your primary source of information about NBS/climate resilience presently?

4. Project Questions (Objectives, Timeline, Impact, Challenges, Benefits (Expected & Unexpected)
    - 4.1. What societal problems that you've worked with does this project address?
        - 4.1.1. Are the issues this project addresses clear to the general public?
            - 4.1.1.1. Is this an issue many Hong Kong citizens are familiar with or regularly experience?
    - 4.2. Was this project developed with the interactions between society, economy, and surrounding ecosystems in mind?
        - 4.2.1. Did these interactions play a significant role in the planning and decision-making process?
        - 4.2.2. By balancing these interactions, would you believe it is easier for the project to be integrated with other nature-focused interventions in the area?
        - 4.2.3. Did you collaborate with any groups to maintain a balance across these different sectors?
        - 4.2.4. Did you identify any risk to the project site or surrounding area?
            - 4.2.4.1. What was done to mitigate risk to the local infrastructure, ecosystems, and biodiversity?

4.3. Does this project consider the current state of the surrounding ecosystem and aim to prevent degradation or loss?

4.3.1. In addition to this, did you implement any measurable assessments that would allow you to track the progress of biodiversity improvement or loss?

4.3.2. Are there any monitoring plans in place that will be able to track and help you minimise any adverse effects placed on the ecosystem?

4.3.3. Does this project give you any opportunities to not only protect biodiversity but also enhance what already exists?

4.4. What are some of the direct and indirect costs associated with this project? How do these costs compare to the overall benefit from this project?

4.4.1. Is the balance of this project's benefits and the cost it takes to run it relatively balanced?

4.4.2. Does the investment in this project consider the short and long-term investments needed to maintain it?

4.4.3. Would you consider this project the most cost-effective way to address the problem?

4.5. Is the project/implementation transparent about its processes and governance?

4.5.1. Is there an opportunity for feedback to be addressed?

4.5.2. Have the direct and indirect effects on stakeholders been identified and considered?

4.5.3. Are stakeholders and local communities informed and involved in decision-making as the project progresses?

4.6. Can this project balance its primary goals with supplying other benefits as the needs of communities and ecosystems change over time?

4.6.1. Does this project have the potential to be altered if a rapid change in climate, development, or environment occurs?

4.6.2. Were any changes made to the initial project to address trade-offs between completing the primary goal and maintaining the present benefits of ecosystems and communities?

4.7. Is this project monitored regularly and adapted to the changing needs of the environment and target audience?

4.7.1. How do you evaluate the need for intervention throughout the project's lifecycle?

4.7.2. Who does the responsibility of managing this project fall on?

4.7.3. Why was this individual/s chosen?

4.7.4. Are they responsible for managing other projects as well?

4.7.5. Do they have additional help or support from third parties?

4.8. Is this project designed to be supported and sustained both environmentally and socially?
    4.8.1. Does the design of this project lead to transformative change?
    4.8.2. Does the regulation and framework of this project support potential mainstream adoption?
    4.8.3. Does this project consider national goals for sustainability, human well-being, and climate mitigation?
4.9. Were there any specific standards or guidelines you used when designing the project?
    4.9.1. Did you coordinate with any consultants on this project? What kind of guidance did they offer? What other resources did you use in developing this project?
4.10. Did you encounter any challenges during this project's planning and implementation process? Were they difficult to navigate?
    4.10.1. What steps did you take to overcome difficulties?
    4.10.2. Why do you think you were able to avoid difficulties? Was it specific to this project, or are NBS relatively easy to implement?

5. Areas of Opportunity

5.1. Were there any incentives offered for the implementation of this solution?
5.2. What are the main benefits you noticed to your business after implementing the project?
    5.2.1. What about benefits other than financial ones?
        5.2.1.1. For example Reputation, ESG score
        5.2.1.2. For Property Developers: Well-being of consumers, increased consumer demand, regulation for residents
    5.2.2. Would any particular incentive be widely popular in the business sector? Something that would be popular among most businesses that would lead to the broader adoption of NBS?
        5.2.2.1. For example, financial incentives, subsidies, rewards, recognition, awards
        5.2.2.2. How prevalent are the tax deductions from charitable donations as an incentive to develop NBS?
        5.2.2.3. How significant, if at all, is the potential good reputation gained from supporting NBS as an incentive?
    5.2.3. What are your motivations for developing NBS? What other motivations do you know organisations have to develop NBS?
        5.2.3.1. Have your experiences with this project provided you with any strategies other businesses could use to implement their own NBS?
        5.2.3.2. Do you think that your experiences with this project could be used to encourage other businesses to explore NBS?

5.2.4. Has your company's efforts contributed to any broader change?

5.2.4.1. Changes seen in the local community as well as larger scopes

5.2.5. Finally, how do you think this NBS will contribute to initiatives promoting sustainability?

5.2.6. Has your company engaged in any top-down change on this topic, such as policy advocacy?

5.2.7. What opportunities are you and your business looking for to further engage in nature?

Interview Questions for NGOs

1. Introduction
    - 1.1. What does your organisation do/what is the overall goal?
    - 1.2. Please tell us a little bit about your role in your organisation.
    - 1.3. What sustainability projects have you worked on for the organisation/company?

2. Climate Change Impact and Nature Risks
    - 2.1. What aspects of nature and ecosystems do you work with?
    - 2.2. What risks to nature may be associated with the ecosystems you interact with?
    - 2.3. How has climate change impacted the work you do?
        - 2.3.1. Does it impact just the environment or how you go about your operation?
        - 2.3.2. Do you need to take extra steps to mitigate the impacts of climate and nature risks?

3. Definition and Role of NBS
    - 3.1. Based on your expertise, how would you define NBS?
    - 3.2. What are some specifics of NBS that you have researched or worked with?
    - 3.3. What differentiates NBS from other similar solutions (Green infrastructure, etc)?
        - 3.3.1. In your field, what goals can be achieved by using NBS?
    - 3.4. What existing international or local standardisation for NBS do you know of?

4. Project Questions (Objectives, Timeline, Impact, Challenges, Benefits (Expected & Unexpected)
    - 4.1. What societal problems within your organisation's scope does this project address?
        - 4.1.1. Are the issues this project addresses clear to the general public?
            - 4.1.1.1. Is this an issue many Hong Kong citizens are familiar with or regularly experience?
    - 4.2. Was this project developed with the interactions between society, economy, and surrounding ecosystems in mind?
        - 4.2.1. Did these interactions play a significant role in the planning and decision-making process?
        - 4.2.2. Did you collaborate with any groups to maintain a balance across these different sectors?
        - 4.2.3. By balancing these interactions, would you believe it is easier for the project to be integrated with other nature-focused interventions in the area?
        - 4.2.4. Did you identify any risk to the project site or surrounding area?

4.2.4.1. What was done to mitigate risk to the local infrastructure, ecosystems, and biodiversity?

4.3. Does this project consider the current state of the surrounding ecosystem and aim to prevent degradation or loss?

4.3.1. In addition to this, did you implement any measurable assessments that would allow you to track the progress of biodiversity improvement or loss?

4.3.2. The random risk is always associated with these projects concerning their ecological foundations. Are there any monitoring plans in place that will be able to track and help you minimise any adverse effects placed on the ecosystem?

4.3.3. Does this project give you any opportunities to not only protect biodiversity but also enhance what already exists?

4.4. What are some of the direct and indirect costs associated with this project? How do these costs compare to the overall benefit from this project? Is the balance of use from this project and the cost it takes to run it relatively balanced?

4.4.1. Would you consider this project the most cost-effective way to address the problem?

4.5. Is the project/implementation transparent about its processes and governance?

4.5.1. Is there an opportunity for feedback to be addressed?

4.5.2. Have the direct and indirect effects on stakeholders been identified and considered?

4.5.3. Are stakeholders and local communities informed and involved in decision-making as the project progresses?

4.6. Can this project balance its primary goals with supplying other benefits as the needs of communities and ecosystems change over time?

4.6.1. If yes, do you expect it will be able to adapt to rapidly changing climates, urban development, or drastic environmental changes?

4.6.2. If not, does this project have the potential to be altered if a rapid change in climate, development, or environment occurs?

4.6.3. Were any changes made to the initial project to address trade-offs between completing the primary goal and maintaining the present benefits of ecosystems and communities?

4.7. Is this project monitored regularly and adapted to the changing needs of the environment and target audience?

4.7.1. If yes or no, how do you evaluate the need for intervention throughout the project's lifecycle?

4.7.2. Who is responsible for the management of this project?

4.7.3. Why was this individual/s chosen?

4.7.4. Are they responsible for managing other projects as well?

4.7.5. Do they have additional help or support from third parties?

4.8. Is this project designed to be supported and sustained both environmentally and socially?

4.8.1. Does the design of this project lead to transformative change?

4.8.2. Does the regulation and framework of this project support potential mainstream adoption?

4.8.3. Does this project consider national goals for sustainability, human well-being, and climate mitigation?

4.9. Were there any specific standards or guidelines you used when designing the project?

4.9.1. Did you coordinate with any consultants on this project?

4.9.1.1. If yes, what kind of guidance did they offer?

4.9.1.1.1. Did you use any additional resources?

4.9.1.2. If not, what other resources did you use in developing this project?

4.10. Did you encounter any challenges during this project's planning and implementation process? Were they difficult to navigate?

4.10.1. What steps did you take to overcome difficulties?

4.10.2. Why do you think you were able to avoid difficulties? Do you believe that it was specific to this project, or are NBS relatively easy to implement in your opinion?

5. Areas of Opportunity

5.1. Were there any incentives offered to stakeholders during the implementation of this solution?

5.1.1. Would you consider any incentive in particular to be widely popular with investors? (For example, financial incentives, subsidies, rewards, recognition, and awards)

5.1.2. Do you seek out investors or funding? If so, how and from whom?

5.2. How do you see your present initiatives impacting the current and future use of NBS in Hong Kong?

5.2.1. Do you think that your experiences with this project could be used to encourage other businesses to explore NBS?

5.3. What types of NBS most interest you? How can they be used?

5.4. What types of locations make the best candidates for NBS?

5.4.1. Do the conditions of a location impact the success of NBS?

5.4.2. Do you think that your experiences with this project could be used to encourage other businesses to explore NBS?

5.5. Has your organisation engaged in any top-down change on this topic, such as policy advocacy?

World Wildlife Fund Hong Kong: Mai Po Nature Reserve

Background Research

Leadership:

- Board:
    - Chairman: Dan Bradshaw - member since 1980s, previous Finance Committee Chairman & Honorary Legal Advisor.
        - Member of the Board of Kadoorie Farm & Botanic Garden Corporation
    - Dr Timothy Bonebreak - Associate Professor in the School of Biological Sciences and Division of Ecology and Biodiversity at the University of Hong Kong
    - Professor David Dudgeon - Chair Professor of Ecology & Biodiversity and Director of the School of Biological Sciences in the University of Hong Kong Science Faculty.
    - William W. Flanz is a senior advisor of the investment centre of fund investment management.
      Comment: Getting a business-centric angle on our project could be helpful.

Projects:

- Mai Po Nature Preserve:
    - 40+ years old, massively successful regional wetland conservation
      Mai Po & Inner Deep Bay wetlands
    - Mai Po Nature Reserve Management Plan: 2019-2024
        - Mai Po Nature Reserve Management Plan: 2019-2024
        - Recognises the ecological significance and educational opportunity of the reserve and aims to support it through Wetland management training supported by all stakeholders
        - Goals:
            - Manage the Mai Po Nature Reserve as a climate-resilient wintering ground for migratory birds
                - Note: How are they going to make it climate-resilient?
            - Sustain the practice of gei wai as an example of traditional wetland use
            - A regional centre of knowledge and awareness on wetland conservation
                - Note: Ask how they spread awareness and how they speak the language of business owners and stakeholders
    - Includes: Gei Wai, freshwater ponds, inter-tidal mudflats, mangroves and reedbeds. A lot of wildlife.
    - More than 10 thousand waterbirds

- Conservation Policy
    - Biodiversity is linked to human well-being. Nature and wildlife contribute to the quality of the urban environment
    - More needs to be done at the government-policy level to tackle the environmental challenges that face our city
        - Note: Goals align with our own. Ask how they are planning to achieve these policy changes.
    - Suggested solutions: country parks, green zones, expanding marine protected areas, developing renewable energy use. Bold actions required
        - Ask about their Nature-based Solutions.
    - WWF Response to 2022-23 Policy Address
        - https://www.wwf.org.hk/en/?25383/WWF-Hong-Kong-response-to-2022-23-Policy-Address
        - Develop green and sustainable finance: green finance moves private and not-for-profit sectors to sustainable development priorities.
            - Note: Ask how this works in practice, the goals, etc.

Site Visit Notes

Walking notes

- The land is owned by the government and leased by WWF for conservation efforts.
- Trail cams for monitoring mammals along the boardwalk
- Manage different habitats
    - Area with water and tiny islands for birds to nest
    - High tide nesting site because birds at shore will fly in when the tide is too high
    - Control the water level not to be too high and have islands they can stand on
    - Without management, it will be dryer and more vegetation and would not be a wetland because trees would grow
        - Cutting grass and controlling water level
        - Water change for nutrients from outside
        - Fish fry and shrimp larvae
        - Gate from outside to get water to flow from the deep bay
        - All WWF staff do maintenance
- Actively manage Mai Po to make bird habitats available to meet conservation targets.
    - Birds are the main target
    - Egress is a group
    - Target needs of different species
- Focusing research on birds that have little research to find how to manage better habitats
- Pollution runoff problems
    - Pollution is an ongoing issue
    - Shenzhen River, Shenzhen has tried to control pollution in the river, so it has been better now.
- Maintenance checkup
    - Binoculars
    - Kayaking into areas to see
    - Circular button on trees
        - Each tree has an individual tag, and the mobile app shows stats for each tree, which are tracked by observation.
- Rural villages
    - Burning trash - old practice
- Bird migration
    - Australia, Thailand, Korea, Siberia
    - Information tracked by a lot of people here
    - WWF tagging projects

    - Tags on several species to see where they go
        - You can see the location of tagged animals on the app on the phone
- Water Buffalo area
    - Grazers keep the grass lower and lead to different landscapes, which are rare in Hong Kong now.
    - This makes a more suitable environment for birds.
    - Has GPS data to see what is the favourite place and what is not favoured in the enclosure
    - A-zai, A-Bo, Sai-Mi
    - Buffalo droppings used for fertiliser
- Bat housing
    - Black, grey, and white to see what is favourable, with black being more warm and white less due to heat absorption
- Nature reserve
    - 1983 establishment
    - 1990 education center
    - Ponds
    - Get wai
        - Shrimp ponds
        - Was marshes before and built gei wais 1km by 100 m
        - Inside are mangroves and open gates to let shrimp larvae in, and they feed on mangrove leaves
        - Harvest by the tidal difference
        - Low tide open gates water goes out and net catches shrimp
        - Used nature for all the work
        - There are big fish, and they eat the small fish that the birds eat, so they remove the bay occasionally by lowering the water level and using nets to move the big fish to the bay outside.
- Rice field
    - Provide more habitats for different kinds of birds
- Other habitats, islands are different shapes and sizes and have to be maintained to give birds more options
- In summer, there are not many birds here, so they raise the water level to prevent reeds and grasses from growing so when the birds come back, the habitat will be better
- Water level sensor for every gei wai, such as rain events where the level is lowered
    - IOT sensor for real-time data

Interview Transcript

Introduction

Q: What is the purpose/overall goal of the WWF?
A: The purpose of WWF is to conserve wildlife and develop Hong Kong as a sustainable city.

Q: Can you tell us more about your role in your organisation?
A: Carmen is the wetland manager and researcher who works on the Mai Po Nature Reserve. Joanne is the senior conservation manager and works on regional collaboration.

Q: What sustainability projects have you worked on for the organisation/company?
A: Research is carried out to inform management on how to manage the nature reserve sustainably. This research includes the Citizen Science program. There is also another program that investigates carbon sequestration from Mangroves.

- The Citizen Science program aids with regular monitoring of the conservation site. Many cameras and sensors are set up throughout the area for data collection. Citizen Science also provides a mixture of research and education to the public.

Climate Change Impact and Nature Risks

Q: What aspects of nature and ecosystems do you work with?
A: The current focus is conserving and managing the habitats of migratory birds in wetland environments. The Mai Po Nature Reserve aims to create and maintain these essential habitats, as it plays a crucial role as a significant migratory stopover for these bird species.

Q: What risks to nature may be associated with the ecosystems you interact with?
A: Some risks to nature include extreme weather due to climate change.

Q: How has climate change impacted the work you do?
A: The occurrence of severe typhoons resulting from climate change poses a threat to the trees and roofs of the bird hides, causing significant damage. Furthermore, heavy rainfall events, including rainstorms, have led to the flooding of ponds.

Definition and Role of NBS

Q: How would your organisation define NBS based on your expertise?
A: WWF's definition of NBS is available on their website, but some main focuses include engaging in actions to manage societal challenges, combating biodiversity loss, and finding solutions to help with socio-economic challenges.

- WWF also worked with the UNEA and agreed with their NBS definition in 2022. WWF is also developing an NBS booklet, which will be available to the public.
- The definition of NBS used by the United Nations Environment Assembly (UNEA) is aligned with the definition provided by the International Union for Conservation of Nature (IUCN). Additionally, WWF International acknowledges and supports these definitions. While WWF International has its definition of NBS, it is not contradictory to the IUCN definition, although the wording may differ slightly.
    - The IUCN and WWF recognise the significance of biodiversity loss but emphasise it differently. The IUCN views biodiversity loss as a broader societal challenge, whereas WWF places a specific focus and priority on addressing biodiversity loss.
- Both organisations agree that the primary benefits of NBS should be directed toward people and society. Additionally, they emphasise the importance of achieving a net gain in biodiversity. In evaluating the effectiveness of NBS, one approach could involve assessing the increase in bird species diversity at locations such as Mai Po.

Q: What differentiates NBS from similar solutions (Green infrastructure, etc)?
A: NBS is considered an umbrella term for these kinds of solutions. Green infrastructure falls within the category of NBS. An example of green infrastructure is green roofs.

Q: In your field, what goals can be achieved using NBS?
A: For the Mai Po, the goal is to conserve and maintain or increase the number of wildlife at the reserve.

- Other goals include keeping the traditional Gei Wai culture and making it a regional hub for conservation.

Project Questions: Objectives, Timeline, Impact, Challenges, Benefits (Expected & Unexpected)

Q: What societal challenges within your organisation's scope does this project address?
A: Before the widespread adoption of NBS), Mai Po primarily focused on biodiversity conservation. However, with the introduction of NBS concepts, Mai Po is now exploring opportunities for integration. For instance, they are considering the inclusion of mangroves, which were not initially considered as NBS but have been implemented in the past for conservation purposes.

- Other societal challenges that are addressed include disaster risk reduction. Mangroves weaken waves of solid typhoons, and the wetlands are a sponge for rainfall, creating better flood mitigation.
- Another goal for Mai Po is to provide education and serve as a training hub. Schools host educational trips about the wetlands for students. There is also training to learn about how to manage the reserve better.
- The nature reserve also targets human health. This location allows visitors to be in nature and have a great educational experience.

Q: Are the issues the project addresses clear to the public when they visit?
A: The site is primarily meant for wilderness and interactions with nature, making it different from the Hong Kong Wetland Park. The reserve also has an extensive management plan. The Mai Po management plan is renewed every five years and is made available to the public.

- The plan includes changes made in the past, goals for the future, and the method of achieving those goals. Conservation targets are also identified, and plans are made for each target.
- A research and monitoring plan is also reviewed every five years.

Q: Was this project developed with the interactions between society, economy, and surrounding ecosystems in mind?
A: Yes. Previously, the Mai Po Nature Reserve ponds were privately owned by individuals engaged in shrimp farming. However, as the profitability of fish agriculture increased, shrimp farming gradually declined. Around the 1980s, WWF Hong Kong expressed interest in managing the area and initiated discussions with the local shrimp farmers. With the help of funding, WWF Hong Kong acquired the Gei Wai (traditional shrimp ponds) from the local community and took on the responsibility of managing the site.

- Subsequently, the Government became involved in the process and eventually repurchased the area. Currently, the Government leases the land to WWF for conservation purposes, allowing them to continue their efforts to preserve and protect the natural environment at Mai Po.

Q: Did you collaborate with any groups to maintain a balance across these different sectors?
A: WWF works with native shrimp farmers in the community. The Mai Po management committee includes NGOs, wetland managers, individuals, and the government.

Q: Did you identify any risk to the project site or surrounding area?
A: The risk is identified by looking for any changes in wildlife and how it compares to the conservation targets.

Q: Does this project consider the current state of the surrounding ecosystem and aim to prevent degradation or loss?
A: The WWF team at Mai Po implements monitoring measures and research to assess the site's conditions and identify necessary improvements. These efforts determine the appropriate steps to enhance and optimise the site. For example, the team introduced water buffaloes to help maintain the grass levels to create a more suitable habitat for migrating birds. Biodiversity enhancement remains a vital aspect of the project, emphasising the importance of promoting diverse species within the reserve.

Q: What are some direct and indirect costs associated with this project? How do these costs compare to the overall benefit from this project? Is the balance of use from this project and the cost it takes to run it relatively balanced?
A: The project's cost and benefits are currently under evaluation, and comprehensive documentation still needs to be completed.

- One of the project's anticipated benefits is the potential of mangroves to mitigate the effects of climate change. However, accurate quantification of these benefits requires extensive data and input from academic sources. While exact figures are unavailable, ongoing research is being conducted to quantify the outcomes more precisely.
- Despite the absence of precise numerical values, the value and significance of mangroves in fulfilling their intended purpose are already evident. The project already yields noticeable benefits, underscoring the importance of preserving and utilising mangroves within the ecosystem.

Q: Is the project/implementation transparent about its processes and governance?
A: Mai Po has a management committee that has different stakeholders.

- There are regular meetings every three months to get feedback from stakeholders.
- There is also a committee for people living nearby that has regular meetups or events so they can gather any feedback the local community has.
- The tours for the general public also provide participants with questionnaires to receive feedback.

Q: Have the direct and indirect effects on stakeholders been identified and considered?
A: The WWF team is currently engaged in research focused on carbon sequestration and the potential climate change mitigation effects of the Mai Po Nature Reserve. They aim to release their findings next year, contributing to a deeper understanding of the wetland ecosystem's impact.

- Throughout the research process, stakeholders actively participate and provide valuable feedback. Their involvement ensures that the perspectives and insights of various stakeholders are considered, enhancing the overall quality and relevance of the research outcomes.

Q: Can this project balance its primary goals with supplying other benefits as the needs of communities and ecosystems change over time?
A: The primary goal is the conservation of biodiversity, and that goal has been kept for the past 40 years.

Q: Were any changes to the initial project to address trade-offs between completing the primary goal and maintaining the present benefits of ecosystems and communities?

- From the climate change perspective, only a few changes have been made.
    - However, WWF adjusts the reserve's management and adapts to changes, such as using data from research to see how to adjust and manage the site.
    - WWF Hong Kong has also examined the difference in biodiversity and bird species in different habitats, such as wet and dry reed beds. The wet reed bed was found to be better.

Q: Who is responsible for the management of this project?
A: WWF takes on the responsibility of managing the habitat and overseeing the educational aspects of the project. They are actively involved in ensuring the preservation and well-being of the Mai Po Nature Reserve. On the other hand, enforcing regulations related to resource management within the nature reserve falls under the government's jurisdiction. This responsibility is carried out by the Agriculture, Fisheries and Conservation Department (AFCD) and the police. Their role is to enforce laws and regulations that govern the proper utilisation and protection of the natural resources within the reserve.

Q: Is this project designed to be supported and sustained environmentally and socially?
A: They want to maintain the culture and environment as it is.

Q: Does the design of this project lead to transformative change?
A: There is space for transformative change if needed.

Q: Does the regulation and framework of this project support potential mainstream adoption?
A: Based on WWF's experience, inclusive governance is beneficial as it allows for managing diverse perspectives from various parties involved. This approach enables a more holistic decision-making process and ensures that different viewpoints are considered.
WWF has implemented a comprehensive monitoring program to assess the effectiveness of its actions. This program provides valuable data and information to the environmental program, enabling it to evaluate and analyse the outcomes of its initiatives. The monitoring program is crucial in informing future actions and ensuring continuous improvement in their environmental efforts.
Q: Did you encounter any challenges during this project's planning and implementation process? Were they difficult to navigate?
A: Some challenges faced include pollution from urban areas such as neighbouring Shenzhen and changing water acidity due to pollution and climate change, affecting the wetland habitat. The wetland relies on the water from Shenzhen Bay, but there is a risk of pollution that cannot be controlled. Another challenge includes invasive species, which must be removed from the environment to prevent their spread.

- Communication with groups such as the EAAF flyway is also challenging. They work closely with countries along the flyway and have regular meetings and training programs to help them with their conservation targets. Regional communication is crucial to be maintained.
- Securing funding is also problematic, as short-term Government funding is for three years, but NBS requires long-term financing.
- Another challenge is legal permits. Mai Po Nature Reserve is on restricted land, so approval is required from the Government to develop or use the land.
- Time usage and cost are high, such as conducting the Environmental Impact Assessment (EIA).
- To manage the site, they have habitat managers who conduct restoration work. Habitats are also being monitored, which is a staff duty, but they must also manage education for tours and students.

Areas of Opportunity

Q: How are positive actions taken to offset the negative ones?

- Constructing wetlands can negatively impact the environment, primarily due to the transportation of materials involved. However, WWF takes measures to mitigate these impacts by prioritising using sustainable materials. For example, they utilise certified FSC wood, ensuring the construction materials come from responsibly managed forests.
- In line with its commitment to environmental conservation, WWF refrains from using chemicals like herbicides for plant control within wetland habitats. This approach aligns with their goal of minimising negative impacts and maintaining the area's ecological integrity.

Q: Were there any incentives offered to stakeholders during the implementation of this solution?
A: WWF has a grading system for different sponsor organisations.

Q: What incentives are provided for increased investment in and funding for the WWF?
A: It would be best to consult the BD team directly for more specific information. Their role involves gathering research concepts and engaging with organisations to identify potential sponsors for the project.

- Project funding comes from various sources, including government and countryside conservation funds. To secure funding, the team must prepare a detailed proposal outlining the objectives and scope of the project.
- Additionally, WWF seeks support from individuals, sponsors, and businesses, such as HSBC, to further bolster the project's resources and impact. Collaborations with these entities play a crucial role in ensuring the successful implementation and sustainability of the project.

Q: How do you see your present initiatives impacting the current and future use of NBS in Hong Kong?
A: Mai Po is an outstanding example of wetland conservation in Hong Kong. The presence of the Mai Po management committee and the comprehensive management plan significantly contribute to the successful implementation of adaptive management strategies and various projects. This unique approach in Hong Kong makes it a valuable reference point for other potential NBS plans or implementations.
The effective governance and management practices demonstrated at Mai Po highlight the importance of structured and collaborative management frameworks in achieving conservation goals. Other initiatives looking to implement NBS can draw inspiration and insights from the Mai Po project.

Q: What types of NBS most interest your organisation? How can they be used?
A: Other types of interesting NBS can be found for marine life. The ocean team is interested in setting up more marine protected areas, a potential NBS, as they can provide more fisheries resources and cater to the biodiversity loss issue. So, it is also an excellent example of NBS.
Q: What types of locations make the best candidates for NBS?
A: The ocean team advocates restoring coral reefs in the Tolo Harbour.

- Other locations include more rural areas where the Satoyama Initiative can be implemented. It has been adopted by people worldwide who utilise natural resources to sustain rural living.

Q: Do the conditions of a location impact the success of NBS?
A: Yes, the location would affect the success or how much work you need to do to bring success for the NBS and maximise your benefits.

- At the same time, if the location is not ideal, then the potential of what you can achieve is more significant because there is much more to improve. Therefore, it is less about “where” and more about “how.”
- There are three types of NBS – Protect, Manage, and Create
    - If the area is less affected, providing the same ecosystem services requires less work than creating a new one.
- NBS also emphasises inclusive governance. If there were many stakeholders, more work was needed to inform everyone about each project and the changes made.
- Many factors go into the success of an NBS.
    - Stakeholder support is one of the keys to success. If there is no support from others, then it is harder to implement NBS projects.

Q: Has your organisation engaged in any top-down change on this topic, such as policy advocacy?
A: WWF is heavily involved in policy advocacy.

- There is another team focusing efforts on policy advocacy. The team is actively gathering internal advice and stance and incorporating these views and suggestions under WWF’s “ask” for the government.
- They also work to share information on social media and maintain good communication with Governments and legislative council members. This is important because legislators will be interested and can bring the knowledge and topics to the Government.

Mai Po Questions

Q: Regarding defining NBS, are there any local standards in Hong Kong?

A: They need to be made aware of local standards. Since NBS is new to Hong Kong, only international standards, such as the IUCN global standards, can be followed.

- One of the goals is to make Mai Po climate resilient.
    - The Mai Po nature reserve includes wetlands and mangroves, which offer natural climate-resilience services.
    - The reserve is also a carbon sink and can fight against storm surges and strong waves with flood retention and wave energy dissipation.

Q: Another goal of the Mai Po Nature Reserve is to make it a regional centre of knowledge and awareness. How is information spread to the general public, and what language should be used?

A: The information can be spread through social media platforms like Facebook and Weixin. The posts should include simple but impactful messages.

- For Mai Po, there are a lot of public tours and education programs to spread awareness.
- Another way of spreading awareness includes the creation of informative booklets. It is essential to word it to keep concepts more straightforward and more concise, as the IUCN standards were lengthy. Therefore, WWF tries to simplify the criteria and indicators.

Development Team Questions

Q: What challenges do NGOs face in Hong Kong when running NBS initiatives or wanting to spread awareness of NBS?

A: The major challenge is that the term is very new, so even if you talk about NBS, people will not know about it.

- It would take time, just like the term sustainability, so it will take a long time before it becomes mainstream.

Q: Has the WWF been getting Government support for implementing NBS or creating awareness?

A: The Government has yet to use the term NBS.

- They have mentioned Sponge Cities in some policy documents but have not mentioned or included NBS yet.
- Suppose they want to implement NBS in the interfaces between land and rivers. In that case, many regulations regarding this topic will need to be implemented, a significant issue the Government needs to tackle before they consider implementing any NBS.
- Other challenges include land rights and management issues. Mai Po is lucky because the Government department AFCD leases the land. Implementing NBS in other locations will require time for communication with the different landowners. Residents living or working near other sites must be considered during development.

Q: The proposed Northern Metropolis expansion of wetlands is an opportunity, but there are challenges, such as the Government and organisations needing to understand NBS. What would you like the Government to do going forward? Many NGOs were concerned about the government's lack of focus on ecological and policy conservation.

A: The WWF is concerned about the habitat loss resulting from the project, as they are causing the direct loss of 80 hectares of wetland. This also narrows down the flight path for the birds, which is very concerning given the area's special ecological significance along the East Asian-Australasian Flyway. They are also concerned about how the site will be used and how the wildlife will be impacted because it is being built so close to the Mai Po area

- There is also a level of uncertainty as to how the wildlife will respond to the development. Currently, the Northern Metropolis will be constructed before the wetlands are expanded. So, it is still being determined where nature will go during development.
- This will also affect the connectivity of habitats. If their habitat is narrowed down, it may affect how they use the entire area.

Q: What would they prefer regarding managing the proposed Wetland Conservation Parks System development?
A: Working with NGOs is a good option, but at the same time, the Government has to think about the financial side, which requires a lot of money. It is something that has to be catered to. One way is to create a wetland trust or Government funding pot to raise enough money to manage the site.

Q: Are there any other ways to protect the Mai Po area if the Government cannot consider the concerns?
A: The Mai Po Nature Reserve is well protected because of the ordinance. The reserve is safe, but the neighbouring area may still be at risk. The Government should have released more details about how the surrounding areas would be used.

Information for Mapping Tool and Website

Mai Po Marshes Nature Reserve

Yuen Long, Hong Kong SAR

Website and mapping tool font: Roboto

FIRST EXAMPLE: Mai Po Nature Reserve

Mapping Tool Writeup

Title Display

Title:

WWF-Hong Kong: Mai Po Nature Reserve

Description:

Wetland and Water Bird Conservation Site

Location:

Peter Scott Field Studies Centre, Tam Kon Chau Road, Yuen Long, Hong Kong

Summary

In the Northwest corner of Hong Kong, the Mai Po Nature Reserve is a key conservation site for wetland ecosystems and thousands of migratory waterbirds.

About: The Mai Po Nature Reserve is protected and managed by the World Wildlife Fund Hong Kong (WWF-HK) and is a research and conservation site. The nature reserve primarily focuses on the biodiversity conservation of wetland ecosystems and provides a wintering habitat and stop-over site for migratory bird species. Throughout its operation, Mai Po Nature Reserve has always utilised NBS. Still, since the broader introduction of NBS as a concept to Hong Kong, Mai Po has explored further opportunities to integrate the reserve with climate change mitigation techniques. The wetlands protected and managed by the Mai Po Nature Reserve can protect coastal communities by retaining the flood water brought by storms and typhoons and acting as a natural buffer. WWF-HK's collaboration with the Government, private sector stakeholders, and local communities is key to the success of this project. The reserve also follows an extensive management plan reviewed every five years and made available to the public. Through guided public visits and a comprehensive management plan, Mai Po has created an accessible and exemplary environment for anyone seeking to learn more about the importance of wetland protection and sustainable development.

Ecosystem Type: Wetlands

Climate Change Impacts Addressed: Habitat loss, biodiversity loss, sea level rise, flooding and storm surge

Key Stakeholders: World Wildlife Fund Hong Kong

Societal Challenges: Climate change adaptation and mitigation, biodiversity loss, preservation of traditional shrimp farming practices

Project Scale: 380-hectare nature reserve

Duration: 1983 – Present

Website Page Writeup

Left Side

Ecosystem Type: Wetlands

Climate Change Impacts Addressed: Habitat loss, biodiversity loss, sea level rise, flooding and storm surge

Key Stakeholders: World Wildlife Fund Hong Kong

Societal Challenges: Climate change adaptation and mitigation, biodiversity loss, culture preservation

Project Scale: 380-hectare nature reserve

Duration: 1983 – Present

Right Side

Summary Sentence and Overview:

In the Northwest corner of Hong Kong, the Mai Po Nature Reserve is a key conservation site for wetland ecosystems and thousands of migratory waterbirds.

The Mai Po Nature Reserve is protected and managed by the World Wildlife Fund Hong Kong (WWF-HK) and serves as a research and conservation site. Nature conservation efforts began in the 1980s when WWF-HK indicated interest in managing the area and initiated discussions with the local community and landowners. Traditionally, the Mai Po Nature Reserve ponds were privately owned and used by shrimp farmers. However, as modern aquaculture techniques became more prevalent, traditional *gei wei* farming declined. Supported by funding, WWF-HK acquired the *gei wai* shrimp ponds (*gei wai* are traditional tidal shrimp ponds constructed in coastal areas which are highly productive and support a large number of aquatic invertebrates and fish) from the local community and took over managing the site. The Agricultural, Fisheries and Conservation Department (AFCD) became involved and repurchased the land area in 1995. Currently, the Government leases the land to WWF for conservation purposes, allowing WWF-HK to continue their efforts to preserve and protect the natural environment at Mai Po.

Today, work in the reserve primarily focuses on the biodiversity conservation of migratory birds and other wildlife species and wetland ecosystems. WWF-HK has worked extensively to integrate Nature-Based Solutions (NBS) into their conservation efforts. WWF's Mai Po team implements regular monitoring and evaluation measures to assess the site's conditions and identify necessary improvements. Through this, conservation targets are identified, and plans are made for each objective. For example, WWF identified that the black-faced spoonbill population was low, making it a target to restore their population. They have successfully revitalised the population, and their new target is to maintain the population trend for 2024. The reserve also follows an extensive management plan reviewed every five years by the Mai Po Management Committee and made available to the public. The plan includes WWF-HK's goals for the site's future, the management methodology, and what previous measures have been taken. This process allows Mai Po Nature Reserve to strive for continuous site improvement and offer transparency about WWF-HK's plans of action for the reserve.

Context and Outcomes:

Wetlands located along the East and Southeast Asia coasts offer countless natural ecosystem services and provide wintering sites and resting habitats for millions of migratory waterbirds moving along the East-Asian Australasian flyway (EAAF). Here, birds can rest during their migratory journey such as from Siberia to Australia, sometimes totalling over 13,000 km. The EAAF is the largest of the world's eight migratory flyways and has the highest number and diversity of bird species. From an ecological perspective, it is notable that the flyway also includes the most significant number of threatened species. Mai Po Nature Reserve aims to create and maintain these ecologically essential habitats as they are a significant migratory stopover for these bird species.

In recent decades, wetlands in Hong Kong have suffered significant degradation, risking the livelihood of every species that relies on these ecosystems. The Mai Po Nature Reserve conservation efforts hold great importance in the survival of threatened migratory birds and in preventing further loss of biodiversity. In addition to functioning as a necessary habitat for waterbirds, the wetlands provide extensive ecosystem services such as protection from climate change impacts and extreme weather. To expand upon this, the wetland ecosystem of Mai Po acts like a sponge during heavy rain events which will better mitigate flooding of local communities, and there are also mangrove forests which can weaken waves from strong storms and typhoons.

The Nature Reserve also offers a unique educational experience for members of the public to learn about the importance of habitat conservation and what the wetlands offer to the environment. WWF-HK regularly hosts educational tours for local schools, and trainings are offered to inform wetland management personnel on good management strategies. Through guided visits and a comprehensive management plan, Mai Po has created an accessible and exemplary environment for anyone seeking to learn more about the importance of wetland protection and sustainable nature management and conservation.

Highlights (Actual Title TBD)

Boxes:

Societal Challenges:

The degradation of the surrounding environment of Mai Po due to pollution and land development has led to habitat destruction and biodiversity loss. Mai Po Nature Reserve aims to prevent further degradation of the wetlands and maintains a varied range of habitats to accommodate as many migratory birds as possible. This supports the reversal of biodiversity loss in the area on a local and global scale due to the reserve's role as a critical stop for migratory birds travelling from Siberia to Australia, for instance. In addition to boosting biodiversity in the area, from a carbon sequestration perspective, the wetland ecosystem can absorb more carbon than it releases, which contributes to addressing the effects of climate change. The wetland can protect coastal communities from flooding during heavy rainstorms and typhoons.

From a social perspective, Mai Po Nature Reserve emphasises the importance of education. WWF-HK offers guided tours of the reserve to inform students and the general public about the benefits of the wetland ecosystem and the traditional *gei wai* culture that was historically practised for decades.

Project Scale:

The Mai Po Nature Reserve is approximately 380 hectares and consists of five main ecological habitats. The habitats include freshwater ponds, mangrove forests, reedbeds, mudflats, and *gei wai*, the shrimp ponds that traditional shrimp farmers used in the past. Since the Mai Po Nature Reserve is a part of the East Asian-Australasian Flyway (EAAF), WWF-HK works closely with other regional countries along the flyway to ensure the EAAF conservation targets are met.

Biodiversity:

The primary goal of the Mai Po Nature Reserve for recent decades has been biodiversity conservation. To meet this goal, the WWF-HK team at Mai Po implements monitoring measures and conducts extensive research to observe changes to biodiversity levels within the reserve. The team then identifies targets for improvement to enhance and optimise the site. For example, in recent years, the team introduced relocated water buffaloes to support the maintenance of grass levels to create a more suitable habitat for migrating birds. Measures have also been taken to keep water levels in wetlands, ponds, and marshes within the ranges preferred by migratory bird species. This is done with sluices that move water in and out between the *gei wai* and the surrounding Shenzhen Bay. Despite the project having flooding mitigation elements, biodiversity enhancement remains vital. This emphasises the importance of promoting diverse species within the reserve. Some key species that enjoy the Mai Po Nature Reserve are endangered, such as the black-faced spoonbill, whose population has been steadily improving thanks to WWF-HK's work. The Eurasian otter is another endangered species that is high on WWF-HK's priority list for population restoration. Lastly, the most common mangrove plant is Kandelia obovata, which is paramount for climate resilience.

Monitoring and Evaluation:

WWF-HK has implemented a comprehensive monitoring programme to assess the effectiveness of its conservation actions. This programme provides valuable data and information, enabling the organisation to evaluate and analyse the outcomes of its initiatives. The monitoring programme is also crucial in informing future nature conservation actions and ensuring continuous improvement in their environmental efforts.

For example, lightweight GPS trackers are put on some migratory birds that stop at the Nature Reserve to determine their flight path and better understand the central flyways across Hong Kong. WWF-HK has also placed trackers on many trees within the reserve that indicate the condition and health of the tree when a phone with their app is placed near the tracker. The health of the trees is essential to ensure that the reserve will maintain a healthy habitat for wildlife.

Governance:

WWF-HK and the AFCD are responsible for maintaining the Mai Po Nature Reserve. WWF-HK's work focuses on wetland habitat management and conservation. The Mai Po Management Committee are responsible for overseeing the management plan. Additionally, the AFCD is primarily responsible for ensuring security and enforcing the protection of the Mai Po reserve.

Finance:

WWF-HK is a non-profit organisation that relies on third-party sponsors, private stakeholders, and Government funding to support daily habitat management and maintenance operations. However, WWF-HK often needs help securing long-term funding to ensure stability for this conservation project site. Grants supporting the implementation and maintenance of NBS and nature-focused initiatives are often given based on a short-term timeline. Still, the scope of efforts required to successfully protect and conserve wildlife species and ecosystems is a continuous and long-term commitment. It is easier to maintain long-term projects if funding extends further.

Goals and Benefits:

WWF-HK aims to conserve wildlife and develop Hong Kong as a sustainable city. WWF-HK prioritises improving biodiversity and conserving the local environment to achieve this. Mai Po Nature Reserve is an important resting point for thousands of species of migratory birds. Through continued efforts, WWF-HK has increased the population and diversity of visiting migratory birds, including many endangered species. Another significant benefit that Mai Po provides is disaster risk reduction. The mangroves within the reserve help mitigate the impacts of extreme weather events and function as a natural sponge, reducing the impacts of flooding.

Under boxes:

Areas of Opportunity:

WWF-HK is always looking for opportunities to expand its conservation work further to protect wetland habitats in Hong Kong outside of Mai Po Nature Reserve. Doing this would provide social benefits to local fishermen and the community, offer stability and support livelihoods, and continue to protect and promote Hong Kong's biodiversity. While obtaining funding for nature conservation is a consistent challenge, there are potential solutions. One way is to create a wetland trust or Government funding pot to raise enough money to manage the site. The presence of the Mai Po management committee and the comprehensive management plan significantly contribute to the successful implementation of adaptive management strategies and various projects. This unique approach in Hong Kong makes it a valuable reference point for other potential NBS plans or implementations. The effective governance and management practices demonstrated at Mai Po highlight the importance of structured and collaborative management frameworks in achieving conservation goals. Other initiatives looking to implement NBS can draw inspiration and insights from the Mai Po project.

Aside from WWF-HK's work to protect and conserve wetland habitats, WWF-HK is interested in expanding its projects. WWF-HK's Oceans team is actively working to promote the establishment of more marine protected areas to ensure more marine habitats in Hong Kong waters are protected by law. Establishing marine protected areas (MPAs) will protect marine habitats and species and will benefit the ocean, the economy, and society.

URBIS: Hong Kong Wetland Park

Background Research

- Independent firm offering consultancy services
    - Landscape planning and design
    - Rural and urban planning
    - Statutory planning submissions
    - Urban design
    - Master planning
    - Environmental impact assessment and mitigation design
    - Golf course planning and design
    - Tree consultancy services
- Completed over 2,300 planning and design projects in the Asia and Pacific region
- Sustainable planning
    - Over 200 design and planning awards
- Projects
    - Hong Kong Disneyland Arendelle, World of Frozen
        - Architecture of Norway in Lantau
        - Urbis was the executive landscape architect
    - https://bluehealth.tools/51-3/ Wetland Park
        - Began in 2005
        - Predominantly man-made wetland with marshes, mud flats, reed beds, mangrove habitats and several storage ponds
        - Recreational and educational opportunities to promote the importance of conserving wetlands
        - The land was previously a natural wetland built over by a large-scale residential housing development in the 1990s, and then it was converted into the wetland park today.
        - The visitor centre provides information and guided tours on the ecology and hydrology of wetlands and migratory birds that visit the area.
        - Awards
            - Excellence on the Waterfront 2007 Top Honor Award
            - 2007 Award for Excellence: Asia Pacific
            - 2007 Global Award for Excellence
            - 2006 HKILA Landscape Design Awards “Excellence” in Landscape
                - Gold and Silver Medals

- November 2023 - Nomination forms for registration of old and valuable trees at the Fanling Golf Course.
    - OVTs: old and valuable trees
    - 222 trees are nominated
    - HK Institute of Landscape Architects, Kadoorie Farm, and Botanic Garden endorse the nominations.
    - Questions:
        - How does this effort of OVT registration compare to other conservational efforts?
        - What incentivised this project?
        - How involved are other institutes like Kadoorie Farm, Botanical Garden, and the HKILA in conservational, sustainability, or biodiversity projects?
- CEDD's proposal for the Stage 2 Feasibility Study on the Green Transit System?
    - Questions:
    - What was the reception of this project, and why do you think it was received as such?
    - How much backing or support does this project have compared to other non-sustainability-centric projects? Why do you think this is so?
    - Is the amount of emissions caused by the development of this project outweighed by the potential reduction of emissions this project will result in?

Interview Transcript

Introduction

Q: Could you tell us more about URBIS and your role in the company?

A: URBIS is a consulting and design company. The organisation has 80 staff members in HK and an office in Shanghai. The company offers consulting services for design and is environmentally focused.

- Sandy is the managing director of URBIS Limited.
    - He is also involved in local organisations that promote green building and sustainable design.
    - He is a HK Green Building Council director, aligned with the BEAM council.
    - He actively encourages the Government to promote these greener goals through his work in the organisations listed above.
- URBIS is very focused on sustainable design
    - Sustainability is at the core of the company's work. URBIS and their employees constantly focus on what can be done to improve their nature-focused efforts continuously.

Climate Change Impact and Nature Risks

Q: Has climate change affected your work at URBIS in recent years?

A: Yes. More clients are paying attention to climate change and want to incorporate mitigation strategies and harm reduction in their designs. One of Sandy's roles at URBIS is to push these environmental issues and get clients to adopt solutions to address their potential obstacles. The consequences of climate and nature-related complications affect the choices included in the designs produced by Sandy and URBIS. For example, the Government was concerned about the flooding of a proposed development due to unusual rainfall events. Because of this, the government needs to consider strategic issues such as the rise of the sea level. In the case of upcoming developments like the Northern Metropolis, the Government proposed this new development and wanted to balance it with the environment. Therefore, in addition to expanding city areas, they will develop some wetland habitat areas to compensate for the development.

- There are two major problems the world is facing at the moment. The first is climate change, and the second is the sixth extinction. (The sixth extinction is biodiversity loss from the stress placed on ecosystems.)
    - The global population is more aware of climate change than biodiversity and protecting nature.

Sandy and URBIS focus on reconnecting people with ecosystems and natural habitats in urban spaces.

- This will be done by introducing nature into the city directly. However, it is essential to note that increased greenery only sometimes now equates to improved biodiversity and benefits for surrounding wildlife.

- While there are standards to maintain greenery in urban spaces in Hong Kong, many companies believe that including greenery is all they must do to be more environmentally friendly.
- If the planning and implementation of green spaces do not consider factors such as the attractiveness and benefits of specific plant species to local and surrounding wildlife, such as birds, butterflies and plants that interact in green spaces, this could lead to biodiversity loss.
- Ensuring green spaces include the correct species of plants and animals is difficult to accomplish, and the long-term benefit/effect requires proper maintenance and upkeep.

URBIS implants biodiverse spaces but cannot control how they are maintained long-term if the maintenance/management responsibility gets passed onto the clients' side or contracted to third parties.

- The biodiversity in unmaintained or improperly maintained spaces decreases even after a few years.
- Lacking or incorrect maintenance of green spaces is primarily due to the need for more education in the horticulture industry in Hong Kong.
    - There needs to be more resources to retain biodiversity, and businesses that want to incorporate green spaces do not mainly focus on maintaining all the details that ensure they keep providing benefits to surrounding wildlife and biodiversity.
- Businesses tend to prioritise what is more economically viable than the biodiversity of an area.
    - It is common for those maintaining the urban greenery to replace the plants installed originally with plants considered easier to maintain. The easily maintained plants are usually not beneficial to local biodiversity and can even become invasive species.
    - To fix the green space maintenance problem, the horticulture industry in Hong Kong needs to be improved.

Definition and Role of NBS

Q: How do you and URBIS define Nature-based Solutions (NBS)?

A: From Sandy's/URBIS perspective, to be an NBS, almost every decision that you make in this field needs to be "nature-based." This means that all aspects of nature need to be considered on a micro-to-macro scale.

Key Points:

- Other definitions may focus more on green and blue infrastructure,
    - Green and blue infrastructure uses the way nature works to project the existing systems of NBS and inspire new developments that will be made in the future.

Project questions

Q: How did this project start? (HK Wetland Park)

A: It started as a mitigation project. One aspect is installing filter beds that can filter water coming in from the stream; however, the Government wanted to do more with this area.

Key Points:

- The project eventually became an educational and recreational function, as well as mitigation. Then, they worked on designing the area, the pathways, and the surrounding buildings.
- The project was completed in 2005 or 2004 and has won many awards.

Q: Could you use any guidelines or standards to develop this project? If not, what were the challenges you had to overcome?

A: At the time of the project's planning, there were no formal guidelines, so much of the project had to be improvised. However, the designers involved were familiar with all the underlying concepts needed to create the project that serves simultaneously as a tourist location and wetlands conservation today. Additionally, experts in the ecology field were consulted to ensure that they were creating the correct environment for birds to visit and thrive in.

- The design of Hong Kong Wetland Park required much more precision than other projects, especially when it came to measurements of walkways and water levels.
    - Birds are very particular about water depth; thus, many details had to be incorporated to maintain the correct water levels so the area would be appealing for local and migratory birds.

- Incorporating and maintaining native plants as part of the design was also a challenging detail because they needed to be sourced and cared for in a way that would not cause further harm to the environment.
    - The plants needed to be sourced and many were grown from seeds.
    - Is a lot better for the environment to not remove plants from their original space and displace them.
- The position for the park was chosen deliberately because it is adjacent to the Mai Po marshes, which allows for unimpeded movement of species between the marshes and the park.
    - Maintaining ecological connectivity is important. It is essential to a project like this one that all aspects of the surrounding ecosystem are taken into account.

Q: Did you take into account the possibility that the ecosystem could change when designing the park?

A: No. This was not taken into account. It was too far into the future to tell and it was not something on their mind at the time. Not enough people are paying enough attention to that.

Key Points:

- The Government's conclusions are not clear as to what the future of ecosystems is. However, the impact of the rise in sea level will likely affect the surrounding area.
    - Hong Kong is located on the coast, and the government needs to address the considerable risk from the rise of the sea level.
    - No matter what Hong Kong does, it depends on other countries to also follow suit on carbon neutrality. Even if Hong Kong transitions to nature-positive initiatives, effort will be needed from many countries around the world to make a global impact on the environment.
- Most of the area designated for the Northern Metropolis will be flooded if there is a rise in temperature and sea level. Not enough is currently being done to avoid this.

Q: Have you noticed any short or long-term benefits to the environment that resulted from the wetlands park?

A: The park facilitates the education of kids which is very important. It also provides a facility to enhance the conservation and protection of the Mai Po marshes. This is also a matter of great importance. The park provides a taste of what the wetlands offer and increases awareness of the importance of wetlands and nature conservation. It is important to work with the natural ecosystem; humans are not separate.

Areas of opportunity

Q: Are there any incentives offered to businesses from the government or other places that would encourage them to implement NBS?

A: Many things need to be done, but a new project being developed will hopefully offer new encouragement. With new projects, many things are being done that have never been done before.

Key Points:

- One project is educating people through green tours, which will be guided tours after the project is completed.
- Feng Shui is also used in many Nature-focused building projects.
    - The idea of Feng Shui originates from how villagers protected the trees behind their villages to shield them from heat.
    - Most of the hills in HK have experienced deforestation, but because of the Feng Shui practice, these areas have remained relatively untouched.

    - These areas are extremely biodiverse. This project reflects the idea of the Feng Shui woodlands. For the past five years, those working on the project have been growing seedlings. A mix of native and non-native trees.
    - There are now a great number of trees that will hopefully be maintained to protect this new biodiversity.
- Hopefully, projects like the ones discussed above will raise the standard for NBS in Hong Kong.

Q: What is the main reason why your clients ask for the development of these projects?

A: Private sector and public sector clients may have varying motivations. Additionally, some developers seek out the best projects. The company may pay higher fees for these developers, but URBIS prefers this because they can do more with the projects.

Key Points:

- Higher-end developers who seek out the best projects also tend to be more broad-minded and do not just focus on economics.
    - These developers are very focused on what their target market wants, and their target market is the public.
    - Developers want the public to buy their products, so they focus their developments on reaching the most popular opinion. They also want to create things that are new, but once people see them, more people will want them in the future.

Q: Does URBIS engage in any public advocacy, especially in the horticulture industry?

A: Not enough, but I am hopeful that that will come in the future. There needs to be more advocacy to fix environmental and climate threats because fixing these problems would improve a lot of other problems in Hong Kong.

Q: Do you have any ways to approach the Government about your concerns?

A: URBIS is always pushing these issues, and there is some pro bono advocacy being done with different NGOs to pursue nature-positive change. The company seeks to find solutions to the problems as a result of climate crisis and biodiversity loss that are in the best interest of the Hong Kong context.

Information for Mapping Tool and Website

Hong Kong Wetland Park

Tin Shui Wai, Hong Kong SAR

Website and mapping tool font: Roboto

Mapping Tool Writeup

Title Display

Title: Hong Kong Wetland Park

Description:

Wetland Conservation, Education, and Tourism Facility

Location:

Hong Kong Wetland Park, Wetland Park Road, Tin Shui Wai, New Territories

Summary

For over a decade, the Hong Kong Wetland Park has conserved and restored its encompassing habitat and ecosystems, providing an educational space for the public to observe and learn about local biodiversity.

Hong Kong Wetland Park began as a mitigation project to create a new freshwater wetland to compensate for land lost during Tin Shui Wai's New Town development. Significant consultation was made to ensure the best position for the Park to support ecosystem connectivity. In-depth research was also conducted to obtain and monitor the correct plant species and water levels for the area. While the main purpose of the project area was initially designated to be an ecological mitigation area (EMA), the Government wanted to expand upon this purpose and transform it into a highly effective ecotourism location. To achieve this, URBIS, the commissioned landscaping company responsible for the design of the Park, conducted a feasibility study for the Hong Kong Tourism Authority. The study investigated the potential development of the new freshwater wetland into a public recreation, education, and tourism facility. The recommendations and Park masterplan were accepted, and Hong Kong Wetland Park was subsequently opened in 2006. The Park is now owned and managed by the Hong Kong Government's relevant environment department. Alongside ecosystem protection, the Park allows visitors to experience the habitats it encompasses and increases awareness of the importance of wetlands and nature conservation among the local community.

Ecosystem Type: Wetland

Climate Change Impacts Addressed: Habitat Loss, Biodiversity Loss, Flooding and Storm Surge

Key Stakeholders: URBIS, Hong Kong SAR Government; Agriculture, Fisheries and Conservation Department (AFCD) and Hong Kong Tourism Board (HKTB)

Societal Challenges: Ecosystem Degradation, Biodiversity Loss, Climate Change Adaptation and Mitigation, Economic Development

Project Scale: 60 Hectares

Duration: 2006 - Present

Website Page Writeup

Left Side

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Summary Sentence and Overview:

For over a decade, the Hong Kong Wetland Park has conserved and restored its encompassing habitat and ecosystems, providing an educational space for the public to observe and learn about the local biodiversity.

The Hong Kong Wetland Park is award-winning, and in 2018, it served 460,000 visitors. Some awards given to the Park are from the Hong Kong Institute of Architects, the Institute of Landscape Architects of the United Kingdom, and the Urban Land Use Institute of the USA. The Park also offers educational talks and guided tours through the facilities. Equipped with walkways, informational signs, and wildlife lookouts for the public to observe local biodiversity in Hong Kong, the Park allows visitors to experience the ecosystems it encompasses and increases awareness of the importance of wetlands and nature conservation in Hong Kong. The Hong Kong Wetland Park uses its facilities to supplement and complement local ecosystems while providing recreational activities for residents. Initially, the Park began as a mitigation effort to create new freshwater wetlands to compensate for habitat and land loss to make way for Tin Shui Wai's new town development. Later, the Government wanted to develop the mitigation project further. In 1998, the Hong Kong Government’s Architectural Services Department designed the

Exhibition Centre and Hides and URBIS was employed to design the external hard and soft landscape. URBIS then conducted a feasibility study for the Hong Kong Tourism Authority to investigate the potential development of the new freshwater wetland into a public recreation, education and tourism facility. At the time of planning and development, there were no guidelines or standards in place to support the designing of nature-based solutions (NBS). Instead, designers at URBIS worked with experts in ecological fields to ensure the project was carried out responsibly and successfully. The surrounding environment, migratory and local species, and human interactions with nature were all carefully considered during the design process. Once the wetland Park was completed and opened in 2006, maintenance and monitoring of the location was handed off to the Hong Kong SAR Government's relevant environmental department.

Context and Outcomes:

The wetland conservation efforts demonstrated at the Hong Kong Wetland Park both protect and improve biodiversity and provide an educational experience for visitors. Location, plant and wildlife species, natural habitats, species interaction, and surrounding ecosystems were all considered when successfully creating and maintaining a biodiverse environment. Significant research and consultation went into ensuring the best position for the Park to ensure ecosystem connectivity. The position for the Park was chosen deliberately, as it is adjacent to the Mai Po marshes, which allows for unimpeded movement of species throughout the marshes and the Park.

Highlights (Actual Title TBD)

Boxes:

Societal Challenges:

Biodiversity loss and ecosystem degradation are prevalent challenges faced by the natural environment in Hong Kong. The severity of this problem is intensified by insufficient awareness of wetland ecosystems and their importance in contributing to climate crisis reduction and flood mitigation. The man-made wetlands maintained within the Park were created to offset the impacts of habitat loss due to nearby housing developments. Wetland habitats also contribute to carbon sequestration and absorb more carbon than they release. Their ability to hold large volumes of water removes carbon from the atmosphere and can mitigate the impacts of extreme weather events. Hong Kong Wetland Park aims to conserve the new wetlands on the project site to maintain these benefits.

Project Scale:

The Hong Kong Wetland Park covers approximately 60 hectares and is located on the edge of Tin Shui Wai town, a residential urban development area. Additionally, the Park contains five habitats: freshwater marshes, mangroves, intertidal mudflats, reed marshes, and woodlands. These habitats foster much biodiversity and are critically important for local conservation efforts. The Park is also adjacent and connected to the wetlands of Mai Po Nature Reserve, another key wetland conservation site in Hong Kong. This supports the migratory birds both in Mai Po Nature Reserve and in Hong Kong Wetland Park, which is vital due to their location within the East Asian Australasian Flyway.

Biodiversity:

Hong Kong Wetland Park includes freshwater marshes, mangroves, intertidal mudflats, reed marshes, and woodlands. Freshwater marshes are the most ecologically valuable habitat found in the Park. The abundant food supply makes the marshes an ideal habitat for various species, including birds, fish, and aquatic invertebrates. Mangrove trees are sturdy structures that aid in climate resilience due to their ability to adapt to the harsh intertidal environment. They also provide food, shelter, and a nursery for many animals, such as mudskippers and fiddler crabs. Intertidal mudflats are the transitional areas between marine and terrestrial environments. These mudflats were designed to attract migratory bird populations that often use Hong Kong as a wintering stop-over site along the East-Asian Australasian Flyway (EEAF). Given many waterbirds are extremely particular about optimal water depth, the mudflats have sluice gates to control water levels. Reed marshes are essential for filtering and treating the water coming into the freshwater wetland system at the Park. Additionally, these marshes serve as food and shelter for birds, amphibians, reptiles, and insects. The Park's woodlands have various exotic tree species that existed before the Park's development. Including a wide range of flora to further bolster and attract biodiversity was also a consideration in the planning and design stage.

Monitoring and Evaluation:

The Park uses the extensive Hong Kong Wetland Park Habitat Management Plan to guide its habitat management practices. Habitat management of the Park is divided into three aspects: water, vegetation and wildlife. Water management is essential to the overall health of the wetlands; the water quality is regularly monitored, and the water level is controlled using sluice gates and pumps. Vegetation management is maintained for amenity and conservation purposes, and the visitation area is managed for patrons' enjoyment. The conservation zones within the Park are not accessible to visitors but are maintained to increase biodiversity and attract more wildlife. Weeds, overgrowth, and invasive plants are removed by Park management while native plants are planted to bolster biodiversity. Invasive species are regularly removed to limit their population and distribution. The Park also deploys artificial nests for forest birds and camouflaged bat boxes to provide roosting habitats for bats, which are placed in the woodlands far away from visitors.

Governance:

The Park is managed by the Agriculture and Fisheries Department and the Hong Kong Tourism Board. The Park follows the Hong Kong Wetland Park Management Plan, an extensive habitat maintenance plan that outlines how to keep each habitat in optimal health.

Finance:

Hong Kong Wetland Park is primarily supported by the Hong Kong Government. The Park also gathers revenue from admission fees and event organising services.

Goals and Benefits:

Hong Kong Wetland Park focuses on three key benefits: education, public awareness, and nature conservation. Generally, there needs to be more knowledge on the ecological importance of wetland habitats in Hong Kong, but the Park addresses this problem well and offers a unique experience for public education and awareness. While also being a distinctive site for Hong Kong’s ecotourism, it allows visitors to learn about the significance of the natural location and neighbouring Mai Po Nature Reserve in a digestible and accessible way. Over the years, the Park has also maintained its original purpose as a conservation site and fully functioning habitat for a variety of resident and visiting species found in the area, specifically migratory waterbirds., despite evolving into an ecotourism site. The Park also contributes positive ecological benefits to nearby water sources. For instance, The Park contains reedbeds that filter water draining from other areas before emptying into Deep Bay.

Under boxes:

Areas of Opportunity:

Hong Kong Wetland Park is a hub for education and awareness of the ecosystems that make up the Park's lands. In addition to these efforts, there has been interest in further development and expansion of the project, which has already experienced many improvements since its opening. In particular, methods to improve biodiversity and manage the habitat have changed over time. Aside from the continuous improvement in park management, there is potential for expanding conservation areas and increasing the park's size. The ongoing revisions to park size and operation methods provide Hong Kong Wetland Park with ample opportunities to increase its adaptability to changes in ecosystems. The initial design of the Park was not intended to be reworked to meet rapidly changing environmental conditions. However, flexible management is a requirement for environmental conservation projects today to ensure they continue to address challenges and benefit surrounding species. The Park's management team is working to improve and expand this mitigation project to adapt to changes on a localised scale, such as extreme weather and rising sea levels. Developing an official flood management plan or protocol could be an opportunity to protect the Park and neighbouring communities.

A Plastic Ocean Foundation: ProjectProsperity

Background Research

Interviewee: Tiffany Cheung (Sustainability Manager)

Project: Bamboo Afforestation #ProjectProsperity

Afforestation Definition: Planting trees in areas that previously or recently have not had any tree cover to create a forest in the area. Types of land to be converted can include deserts, grazing land, disused agricultural fields, or industrial areas.

APOF Info

- A Plastic Ocean Foundation aims to reconnect people to the ocean and restore it to its healthy status through conscious movement, nature-based science, and education about ocean recovery.
- Projects are two main types
    - People Empowerment
        - OneTonneLess
            - Cleaning up at least 1 tonne of ocean waste every year on beaches
            - Citizen waste audit to figure out what makes up the waste
            - Removing abandoned nets from Hong Kong water
        - GreenCollar
            - Empowering and training young local talents and shaping them into future leaders within the green industry
            - Driving positive change through ESG practices
        - BlueOceanSchoolNetwork
            - Connects schools, projects, and people who dedicate themselves to ocean literacy and the sustainable management of the ocean.
            - Uniting the voices of the younger generation
            - Establish ocean literacy at a young age
        - OperationYu
            - Empowering underprivileged communities that are more susceptible to climate change
            - Develop climate resilience and nurture a communal sense of climate consciousness
    - Nature-Based Science Approaches
        - ProjectProsperity
            - First Bamboo Afforestation Initiative of Hong Kong

        - Rehabilitating abandoned farmland with bamboo forests
    - LivingShoreline
        - Marine Habitat Restoration
        - Carbon sink, safeguards coastal communities, and restores vital habitats
        - Using specially designed eco-shellfish units to create a living shoreline
    - BlackSoldierFly
        - Black Soldier Fly larvae can convert organic waste into valuable resources within a short period of time
        - They convert food waste into animal feed and fertilizer
        - This can be used for food waste such as fruit and vegetable peels and expired food

APOF Project Prosperity:

- Rehabilitate abandoned farmland at Ha Pak Nai by planting bamboo in order to restore the ecosystem there.
- Benefits
    - Remove elemental pollutants
    - Prevent further habitat destruction
    - Marine conservation (by preventing plastic waste from entering the ocean)
    - Bio-based product manufacturers can use the locally grown bamboo to make products
    - Employ local youth workforce in the rural area

Site Visit Notes

- Back in the day this was fertile farmland
- 5-10 min drive to landfill which blocked off some of the ability to get to different places you have to drive around it
- Less farming and fishing now compared to before
- Chicken farm is another source of water and land pollution
    - Chickens are put in crowded spaces and the excretions will go into the soil and water
    - Antibiotics are also used in chicken feed so there is a lot of other chemical pollution dissolved in soil and underground water
- Environmental stress on the area
- The land is being rented for storage and industrial operations and the pollution is getting worse and worse
- Very annoying for those who choose to stay in ha bak lai
- Get in touch with the village community and understand the history of the area and start planning what to do if people want to come back to the area
    - Have to attract young people coming back other than just the elderly staying here
    - Have to reconfigure the business here, people have to make a living and it becomes an incentive for them to come back
- Black soldier flies
    - Like high protein food waste
    - Can handle spicy
    - Test different foods like spicy, congee, vegetables
    - Don't eat bones or skin
    - Larvae are good animal feed
    - Collaborating with CUHK, Chinese herb garden
        - Supplying them with well fed black soldier fly larvae for fish feed
- Bamboo Afforestation
    - Started in 2022
    - Planting site is next to landfill, too far away to visit today
    - Testing different types of bamboo
    - Seeing if they will be welcomed by community
    - Attract property developers to incorporate the bamboo in their future projects

    - Muso bamboo
        - Common in Southeast Asia, Taiwan, India
        - Taiwan has large scale bamboo plantations and high quality bamboo can be used for paper and wooden products
        - Can grow as thick as a calf
        - High quality timber for building small bamboo huts
        - Bamboo has symbolic meaning
        - Use of bamboo in Taiwan is common but Hong Kong has less bamboo architecture other than scaffolding
        - It can be used a couple of times before it breaks
        - Need large land for growing the bamboo, have to negotiate with land owner to talk about benefits rather than the land being used for storage or industrial purposes
- Discussion with villages and stakeholders in region for projects such as the bamboo afforestation
- What species would be more useful or welcome, if there are more commercial success then villages will be more inclined to try
- Two sites for planting
    - Constantly exploring chances of opportunity to persuade land owners to use the land for the project

- Landfill
    - Lots of leakage, windy day or typhoon the trash will be blown into the river and will end up in the sea
    - Project aims to stop the trash from entering the water body by identify sites that receive the leakage and planting the bamboo to act as a green fence
    - Physically they will stop the trash but will also cleaning the soil
    - Bamboo is very tough type of plant and can be planted in very stressed environments like heavy polluted areas
    - The bamboo will absorb the pollutants, very long process, but initiate and let the community and villages know that they can clean the soil by planting the bamboo
- Retired farmer has experience with crop rotation and planting of bamboo is similar, when nutrients are gone from soil another plant is used to make the soil have nutrients again
- Black soldier flies fertilizer can be used sometimes
- As NGO they are thinking of overall and holistic way to integrate their efforts
    - For conservations and to turn this area into habitable environment for people and others, such as migratory birds

- NBS
    - Rather specific definitions but they are focusing on ecosystem service
        - Ecosystem service is what we humans can get from nature to support our lives
        - For other organisms they also get what they need from nature, shelter, food
        - Other service is from climate level
        - Another one is climate regulating functions of nature
        - It's not just about economic losses but it is about everything
    - This used to be very healthy environment but pollution happened because of human activity so they are trying to reverse it
    - In the end it benefits human society
- One project is to use bamboo forest for carbon storage
- Philosophy of organizations
    - People and oceans, people first because they need human input
    - They also want to solve the problem that people are facing
    - Bamboo afforestation project they are not just communicating with farmers they hire them
    - They are at the border of new territories and the average income is rather low
    - Have group of under-educated young people who don't have much to do and they don't have the interest for academics so they engage that group in this project
    - Farming is very physically demanding but is perfect for that group,
    - Organize workshops for the young people to learn and they get to interact with the older farmers
    - Offer them opportunities to meet the private sector so there is a very good chance for them to more opportunities with people they usually can't get in touch with
- Have financial aid from corporate partners who want to make these things happen
- Super typhoon a few years ago
    - Flooding here got up to the chest
    - Not reported in the news because there was not much news value
- Five rivers from mountain peak running to this area
    - Making flooding problem worse when there is wet season rivers get very close to edge
    - High tide and typhoons can flood high floods
    - When storms are with high tide it is much worse
- Villages
    - Village chiefs are more powerful and mobilize more people
        - Representative of villagers
    - Villagers have not experienced the weather events like the rainstorms like before
    - It is warmer now but when it gets cold it gets colder

    - Have been in communication before 2001 with villagers
    - Built a very good relationship and get lots of intelligence and knowledge about farming, fishing, geography
    - Fits into how they plan their project
    - Engage with the private sector
    - Old people more concerned about environment because they have had experience while the young people are more attracted towards the economy and money
- Mudflats
    - Mangroves are growing in the area
    - There are mudskippers in summer
    - Sometimes there are people who catch them to sell
- Mai po
    - Ecotourism
    - When the policy favors ecotourism they make a lot of efforts to conserve the environment, what the government tells you to do what you have to do
- Green groups are usually not in good relations with land owners since land owners can to sell land in high price while green groups want conservation
- APO has great relations with village chiefs
- Development
    - Want integration here with shenzhen
    - Shenzhen is planning to have railway through ha pak lai
- Guidelines or standards for making project
    - Check regulations from land department
    - Different parts of Hong Kong has exclusive land use for different purposes
    - Coastal protected area cannot be built anything
    - Some privately owned land can be agricultural land
    - Lots of rural land are agricultural use
    - Land use guidelines
    - Didn't use NBS or bamboo afforestation standards for project
    - Integrating community and government regulations and have to get balance with all parts in order to start project
    - Still in very early stage
    - Started with NBS definitions and then decided site specific solutions
- Environmental projects are very local and relate to the local values and heritage and specific context

Additional notes:

- Attract community developments, attract business and families.
- Accessibility of this place is low due to the landfill blocking
- Flys can consume food waste, high protein
- Project started during COVID which presents challenges
- Property develops include the bamboo they work with into the projects since it's attractive
- Musel bamboo is very popular and it's the one they use. High-quality timber, Chinese culture has symbolic meaning of justice. Also used as scaffolding, can be reused before breakage
- These plantations are used for carbon sinks and turn it into products like cutlery and toiletries
- They need to negotiate to plant things instead of using it for storage or industrial use. They are long and complicated conversations. Part of her job is to negotiate and communicate with the stakeholders in the community. This is a big challenge. The result of this negotiation goes back to their future planting project: what species will be more welcome if the species has a higher commercial value.
- Bamboo will work to physically prevent rubbish from entering and reduce pollution. The soil is already bad for agriculture.
- Bamboo planting cleans the soil. It is a very resilient plant that can be planted almost anywhere. Bamboo absorbs pollutants over time and cleanses the soil.
- Crop rotation can be aided by bamboo planting. After the nutrients are drained from the soil, you can plant bamboo to recover the fertiliser of the ground
- Natural fertiliser is used by APOF
- APOF is looking at this holistically to aid in overall conservation and restoration of the area to be hospitable to people. Also aids the birds since it's a feeding ground
- What they define NBS to be: ecosystem services instead, for example, the land used to be fertile, and people lived in harmony and then pollution occurred, and now APOF is trying to reverse the effects of pollution focused on ecosystem service. Ecosystem service is what animals and people can get from the environment, climate regulation being addressed (greenhouse gases), and restoration
- Main challenge is people. They need to make a living. If bamboo growing is not economically attractive, it's hard to get traction with projects
- APOF puts people first since they are "team humans".
- The average salary of people in this region is low, and APOF is giving jobs to those who are not interested in going into academics. It's a difficult job since it's farming. They organise workshops to give them the experience and education to work on the farm. There is positive chemistry between retired farmers and young workers. They have the financial support of their corporate partners to make this possible. The workers get opportunities to meet representatives from the private sector. This expands their network and is beneficial to them. It's not just conservation. It's also helping the community and raising public awareness of this location.

- When the typhoon hit here, the flooding was very bad, and water came up to your chest. The super typhoon made the situation much worse but this area didn't get any media coverage. This is a big issue.
- What affects the survivability of the bamboo during flooding is the salinity of the water. They're not mangroves.
- Challenge with flooding: the river has a bridge that regulates the flow, which just makes the flooding worse.
- A lot of the project gains support from the community leaders to help. The community leaders can create a lot of traction and help since this area is very remote. The edge of HK.
- There was a lot of pollution from the river in China. Right now, there is an ecotourism boost, so that favours sustainability here.
- Some people steal mudskippers from the reservation, and they rely on the community leader (the village chief is religious). AFCD should be doing things, but usually, they don't do much.
- There is a very good relationship with the community that has been developed since before 2001. Engagement with the private sector also helps. All these connections help with gaining intelligence.
- There are representative elections for religious leaders in the nearby community. Rural areas usually have smaller populations, so people have familial bonds, so the chief has a high chance to be the cause of nepotism.
- The village chief is very important in negotiations.

Interview Transcript

Introduction:

APOF's perspective as a non-profit organisation takes a holistic approach to its nature-focused projects. Project Prosperity is just one of the many projects under their portfolio, all of which aim to achieve similar goals in terms of addressing local environmental challenges and supporting the local community. Their goals go beyond just conserving and protecting the local fauna and flora. Including the community's need to create a habitable environment for humans and the local fauna and flora. Their focus is actually on ecosystem service since all their efforts are for the benefit of human society. As part of their project, they seek to address the community's needs to create a habitable environment for humans. Additionally, this includes reversing the effects of human pollution on the environment.

Climate Change Impact and Nature Risks:

Does the bamboo survive the flooding?

In recent years, Hong Kong has been experiencing an increase in extreme weather events. Some of the most problematic events are super typhoons and increased rainfall. During these super typhoons, the area of Ha Pak Nai experiences heavy flooding, which poses a big threat to the safety and well-being of the villagers. To lessen flooding risk and impact, APOF is working to plant bamboo along the side of the river. The bamboo's survival rate is not 100%, and salinity negatively affects bamboo since it can survive flooding but not high-salinity water. Due to this, planting is done near river borders to protect them from salinity.

Definition and Role of NBS

Did you use any guidelines or standards to develop this project? If not, what were the challenges you had to overcome?

- There has yet to be an official nature-related standard since the project concept is very new and in the early stages. Nonetheless, APOF has in-house experts in the field to guide this project. such as Dr Queenie. More broadly, no concrete guideline or standard was considered when designing and implementing the project, as the concept of nature-based solutions is still very new in Hong Kong.
- The guidelines APOF need to follow are from the regulations of the Hong Kong Land Department. They can develop their projects as long as they don't violate the government's land guidelines. Additionally, as stated before, there is still the challenge that privately owned land must be negotiated to continue the bamboo planting project.

Project:

Overview:

- This project has been in place for around two years. Due to COVID, the project was put on hold in 2022. Since the project was resumed, APOF has been experimenting with different bamboo species companies use in urban greening and landscape design. The project began using Moso Bamboo, the most common species in southeast China, and APOF is continuing to experiment with a few other common bamboo species. The bamboo species are being tested to identify which species are welcomed by the local Ha Pak Nai community to scale up the project and attract property developers to incorporate bamboo planting into their developments.
- In Hong Kong, there is less bamboo architecture compared to neighbouring countries. Regarding architecture and construction, bamboo is mainly used as scaffolding in Hong Kong since it can be reused and is strong. However, bamboo trunks can grow very big, meaning the land on which it is planted needs to be spacious. This leads to another problem: villagers and landowners in the surrounding area want to avoid planting this bamboo that takes up space.

Ecosystem service:

- Ecosystem services can be defined by what humans can get from nature to support their way of life. In the same way, other organisms get what they need from the environment in the form of shelter and food, for example. A significant benefit of ecosystem service is the regulation of functions of nature, such as removing greenhouse gases. These natural services are important to APOF since they are concerned with reversing the effects of climate change. Additionally, it is urgent since if nothing is done about it, the consequences will be disastrous for the environment and humanity.

Key Objectives:

- The bamboo planting has been expanded to the area next to the landfill and fish ponds, which are vital for the village's fishing. Bamboo has also been intentionally planted along other bodies of water, such as rocky streams. A few years ago, there was no covering on the WENT Landfill next to the riverbank; therefore, high quantities of rubbish were blown away when the wind blew. Additionally, there was a lot of rubbish leakage into the Tsing Tai River, which then leaked into the sea and created a big marine litter and pollution problem.
- The project aims to stop the rubbish from entering the bodies of water by using bamboo as a natural intervention and buffer. To achieve this, there is a process to prioritise and identify the sites where significant waste leakage can be observed. In these locations, bamboo, which works as a physical barricade to stop rubbish from entering the sea, is planted. Additionally, bamboo can be grown in very stressed environments since it is remarkably resilient. Bamboo can absorb pollutants and clean the soil it is planted on, making it more apt for agriculture, whereas growing plants in polluted ground would typically be impossible.
- The bamboo planting project also aims to support carbon sequestration by utilising planted bamboo as a natural carbon sink. However, quantifying this sequestration is very difficult since the calculations involved in formulating this data are complicated. Nonetheless, APOF's main aims are to plant healthy bamboo for carbon storage, clean soil, and stop rubbish flow into the sea.
- Environmental issues need to be better understood in the corporate world. Therefore, to address this issue, APOF has made it a project goal to aid in the transfer of knowledge into the private sector.

Areas of Opportunity:

Stakeholder engagement and challenges

- One of the project's biggest challenges is the negotiations with all the stakeholders and navigating community dynamics and relations. The result of these negotiations goes back to the project's experiments of finding a bamboo species that would be more useful to the community, ideally in its higher commercial value to aid in a new economic activity.
- APOF must participate in regular negotiations to communicate and advocate for the benefits of planting bamboo and make a case for this nature-based solution to local villagers, who would normally prefer to convert the land to sell or rent for storage or industry purposes, which is more financially attractive. This communication is vital since the project can only go further with the community's support.
- APOF is actively searching for opportunities to persuade landowners in Ha Pak Nai to allow them to use their land for bamboo afforestation.
- The biggest obstacle for the project is that the villagers need to make a living, and planting bamboo could be more economically attractive. Therefore, if the planting is not financially attractive, landowners will not comply to have bamboo planted. If the project cannot expand to have more bamboo plantations, they cannot continue.

Utilising bamboo for agriculture:

- Retired farmers pointed out that bamboo can be used for crop rotations. This is why they do not utilise chemical fertilisers since bamboo can fertilise the land, bringing nutrients back to the soil.

Philosophy of organisation and how they help the community:

- The organisation's philosophy is to put the people first since they need human input to solve the problems people face. Additionally, when it comes to the bamboo afforestation project, they communicate with the community and hire them to work on the project.
- The community is on the border of mainland China, and the average income of the community is very low. Also, the community has a lot of young people who have not had the opportunity to go into academics. APOF sees this as an opportunity to provide young people with jobs in the form of farming, a very physically demanding job, which is a good fit since they need young, healthy people to work it.
- These young people receive training workshops and are taught how to farm. This development in farming has created a positive chemistry between the old retired farmers and the young people of the community. Furthermore, this operation model is ideal for APOF.
- Additionally, they receive financial help from the private sector. This private sector is also helpful to the young workers since they are given networking opportunities as they can meet the stakeholders in the private sector, hopefully leading to better job opportunities they would not have been able to enjoy otherwise. The project is about conservation, helping the community, and raising public awareness about conservation in Ha Pak Nai.
- The area needs to be covered more well by the media. A few years ago, when a super typhoon hit Hong Kong, the tide overflowed and heavily damaged the community, but there was barely any coverage due to the lack of media attention in these areas.

Is this project designed to be supported and sustained environmentally and socially?

- The Village Chief can mobilise villagers to help. Since this is a very remote area, their support is needed. Village Chiefs are elected leaders, but since the population is small and there are just a few main families, the elected leaders are typically the sons or relatives of the previous leader.
- Another problem the wetlands face is that people steal mudskippers during summertime. They sometimes come from mainland China at night in boats. Since there is no patrolling from police to stop them, the problem is hard to address. However, when the villagers spot poaching, they communicate with the village chief, who is the primary contact point for APOF and the local community.
- Furthermore, due to this lack of patrolling, villagers are an essential source of information since there are no cameras or other reliable forms of gathering information around Ha Pak Nai.

Chinese government's protection of wetlands:

- The Chinese government is working to protect wetlands near the river. This effort was initiated to boost ecotourism. It is also why the river is not as polluted any more. A lot of trash came from the Chinese side of the river. However, in recent years, that has reduced.

Information for Mapping Tool and Website

Project Prosperity

Ha Pak Nai, Hong Kong SAR

Website and mapping tool font: Roboto

Mapping Tool Writeup

Title Display

Title: APOF: Project Prosperity

Description: Conservation Site

Location: 283A Nim Wan Road Yuen Long.

Summary

ProjectProsperity is a bamboo afforestation project that aids in climate resilience, environmental cleanup, and economic improvement for the locals of Ha Pak Nai.

A Plastic Ocean Foundation (APOF) continuously seeks to incorporate environmental education and community building into ProjectProsperity's ecosystem restoration and service goals. ProjectProsperity uses bamboo for the local environmental cleanup of Ha Pak Nai's soil and water sources. Bamboo is an extremely versatile plant, able to act as a natural intervention and buffer for pollution. It is also able to purify and fertilise nearby soil. In addition to its primary environmental focus, ProjectProsperity benefits both the local community and Hong Kong's private sector. APOF utilised the broad skillset required for the afforestation of bamboo as an opportunity to create jobs in the communities surrounding their projects. Retired farmers are recruited to teach young workers how to plant and farm bamboo, creating vital intergenerational knowledge exchanges. APOF also works closely with corporate stakeholders to keep them informed on the progress of the project and the importance of ecosystem service. These involvements create networking opportunities between Hong Kong's private sector and the underemployed workforce of rural areas. Although research and the project are still developing, APOF displays a unique trade-off between prioritising the environment and creating positive interactions between nature and society.

Ecosystem Type: Wetlands, Riverside

Climate Change Impacts Addressed: Habitat loss, biodiversity loss, sea level rise, flooding and storm surge

Key Stakeholders: A Plastic Ocean Foundation

Societal Challenges: Climate change adaptation and mitigation, biodiversity loss, economic development

Project Scale: Shorelines along Ha Pak Nai

Duration: June 2022 - Present

Website Page Writeup

Left Side

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Summary Sentence and Overview:

ProjectProsperity is a bamboo afforestation project that aids in climate resilience, environmental cleanup, and economic improvement for the locals of Ha Pak Nai.

A Plastic Ocean Foundation (APOF) continuously seeks to incorporate environmental education and community building into ProjectProsperity's ecosystem restoration and service goals. ProjectProsperity uses bamboo for the local environmental cleanup of Ha Pak Nai's soil and water sources. Over the years, Ha Pak Nai has suffered significant environmental pollution due to rubbish and chemical exposure. This resulted in viable farmland becoming damaged and losing its ability to yield effective crops. However, ProjectProsperity can offset these negative impacts. Bamboo is a highly versatile plant, able to act as a natural intervention and buffer for pollution. Its properties also allow it to purify and fertilise nearby soil. In addition to its primary environmental focus, ProjectProsperity benefits both the local community and Hong Kong's private sector. ProjectProsperity requires a high amount of maintenance to remain successful. To address this, APOF offers employment to younger adults in Ha Pak Nai. Retired farmers instruct youth on bamboo agriculture through these green jobs, creating vital intergenerational knowledge exchanges while providing consistent employment. APOF also works closely with their corporate stakeholders to keep them informed on the progress of the project and the importance of ecosystem service. These involvements create networking opportunities between Hong Kong's private sector and the Underemployed workforce of rural areas. Bio-based manufacturers also benefit from this as they can purchase locally-grown bamboo for their products. Although research and the project are still in progress, APOF displays a unique trade-off between prioritising the environment and creating positive interactions between nature and society.

Context and Outcomes:

ProjectProsperity aims to prevent pollution and protect the nearby ocean in Ha Pak Nai. The planted bamboo naturally restores soil nutrients and can survive extremely harsh conditions, making it ideal for restoring biodiversity in spaces that have experienced ecosystem degradation. The project began using Moso Bamboo, the most common species in southeast China. APOF has also introduced other native bamboo species to the plantation sites, positively affecting local biodiversity.

Due to ProjectProsperity requiring consistent maintenance, many green job opportunities are available to underemployed youth in the Ha Pak Nai area. This allows them to begin careers in sustainable farming, establish intergenerational knowledge, and provide income for the local economy.

The bamboo that can be harvested from ProjectProsperity offers sustainable resources to manufacturing companies. While bamboo architecture is less prevalent in Hong Kong, it is commonly used as scaffolding in construction projects. Using locally sourced bamboo is environmentally sustainable and cost-effective. Additionally, outsourcing bamboo to these companies provides an opportunity for additional economic growth in Ha Pak Nai. It has the potential to increase the availability of green jobs in the area.

Highlights (Actual Title TBD)

Boxes:

Societal Challenges:

ProjectProsperity aims to rehabilitate abandoned farmland at Ha Pak Nai to provide a cleaner future and opportunities for the surrounding community. Bamboo can store high carbon from the atmosphere, purify the polluted soil, and act as a natural barrier to stop waste from entering the ocean. Using local bamboo species in ProjectProsperity significantly improves the area's declining biodiversity. Lastly, ProjectProsperity boosts local economic and social development. The need for continued maintenance of the project led to the creation of new green jobs in the area. These new opportunities allow underemployed Ha Pak Nai youth to develop a sustainable agricultural career while exchanging intergenerational knowledge with older coastal farmers.

Project Scale:

Currently, there are two major plantation sites for ProjectProsperity: Near the WENT landfill and along the riversides of Tsing Tai Rocky Stream. Since its launch in 2022, APOF has planted more than 460 bamboo shoots and is continually working to expand and further develop this project to encompass more land in Ha Pak Nai.

Biodiversity:

Ha Pak Nai is an extremely important biodiversity hot spot, encompassing many different species of plants and animals. However, pollution has heavily damaged the area, and the previously used farmland has been abandoned. Reducing soil and nearby water pollution will recover these species' habitats and make the land viable for agriculture. Additionally, APOF specifically uses local bamboo species to restore local biodiversity, these being Moso, Sinobambusa tootsik, Phyllostachys nigra, and Indocalamus longiauritus.

Monitoring and Evaluation:

Project Prosperity is monitored and managed by APOF staff. Bamboo is a very resilient plant that does not require significant upkeep. However, the health of these plants is essential to the project's success. For this reason, bamboo plants are regularly monitored through observations at the plantation sites. APOF also relies on the help of the locals at Ha Pak Nai to report any observable changes in the environment to the village chief, who then communicates with the project managers. This communication network with the villagers is critical to project success, as security cameras or other electronic means to monitor the environment are unreliable options.

Governance:

A Plastic Ocean Foundation is a science-driven NGO that is endorsed and is partnered with The United Nations Decade of Ocean Science. APOF comprises educators, scientists, journalists, and entrepreneurs who share a passion for preserving and improving the ocean and work with other NGOs and local communities on policy advocacy and various projects.

Finance:

A Plastic Ocean Foundation is a charitable NGO that relies on various private stakeholders and public donations for support. With the help of Give Asia, they have an easily accessible fundraising page that allows you to donate in monthly instalments or make a single donation. Additionally, donations to APOF are eligible for tax deduction.

Goals and Benefits:

APOF's ProjectProsperity aims to rehabilitate abandoned farmland by installing bamboo forests to restore Ha Pak Nai's ecosystem. Bamboo has incredibly versatile characteristics, removing pollutants and gradually purifying its surroundings.

Bamboo is a natural intervention and buffer to counteract land degradation and ecosystem pollution. It is a physical barrier to catch rubbish before emptying into the ocean. Additionally, bamboo can be grown in extremely stressful environments due to its remarkable resilience, making it ideal for soil purification. Bamboo can absorb pollutants and clean the soil it is planted on, making it usable for agriculture. It is also efficient at carbon sequestration due to its fast-growing speed and large carbon capacity.

Maintaining ProjectProsperity provides green job opportunities for underemployed young adults in the Ha Pak Nai area, allowing them to begin careers in sustainability while forming deeper connections with their elders and community.

Under boxes:

Areas of Opportunity:

While ecosystem health remains ProjectProsperity's top priority, APOF has found ways to integrate human health and development to expand upon the benefits of this NBS. Planting and maintaining bamboo requires a great deal of manpower and can be very physically taxing. However, this allows for more green job opportunities for young adults residing in Ha Pak Nai. Many Ha Pak Nai residents have continued to live in the village for their entire lives, but recently, there has been a sense of disconnect between the older and younger generations. These green jobs offered by APOF allow young adults to learn useful skills while connecting with their communities and elders.

ProjectProsperity can also provide resources to manufacturing companies interested in investing in bio-based products. Scaffolding used in building construction is often made from bamboo. Using locally sourced bamboo is environmentally sustainable and cost-effective. The opportunity to outsource this bamboo would further develop jobs available to the community and bolster the local economy.

Swire Properties: Taikoo Place Redevelopment

Site Visit Notes

Taikoo place

- Originally white stone on the paved ground is from India
- The Brown Stone is from Canada
- The type of tree used is the spider tree, and the trees were not in the place in the past
- They are deciduous trees which are difficult to source. They needed inspections and soil and were transported at 10 years old
- Needed trial digs to find utilities and needed to move some of them in order to plant trees and give space for their roots, depth and spread
- Roots are surprisingly shallow, for example look at some uprooted trees after typhoons
- Pioneer trees, with seeds brought by birds and such have shallow roots
- Other trees have deep roots, but the one here does not because there is a slab underneath for the underground car park
- Continuous soil corridor instead of isolated areas is preferred for trees, but underground basement slabs prevented that, but no one tree is isolated
- Soil is very important
- Historically trees have been squeezed in tight spaces so they do not have the healthy base to withstand typhoons and storms
- Plant boxes along pedestrianized vehicle passage way

Taikoo garden

- During hot summers the large trees provide shade
- Plant species are selected with seasonality with flowers and different colors
- Plant textures, shapes, color are all important for urban design
- Difficult to have 100% native plants since people are used to seeing a large variety of plants and nurseries work by demand so have more exotic plants

Getting trees

- The client wants instant results so the trees should be as large as possible
- Trees are limited by size for sourcing and transportation, if they are larger than a container it is not possible to transport
- There are anchors on trees for use during heavy winds and typhoons
- Anchors take up soil space so need to make trade offs on space for tree roots vs. space for anchors
- Transplanting for large trees are harder than younger ones

Taikoo Redevelopment Garden

- Will be completed around mid July
- Have lots of vents throughout space which was not in original plan but Swire was instructed by the government to construct an underground car park which they did not want or need but the government needed Swire to do so
- Trees were still able to be planted working around this plan but not ideal from original plans
- The trees chosen do not have aggressive roots, planters are water proofed and have drainage layers
- Soil has mineral content, organic content, and things that need to be tested by approved labs to determine if the soil is acceptable
- Soil in Hong Kong is mostly fabricated soil, nowhere can you dig up native soil legally, so they use CDG (completely decomposed granite) which is just mineral and is mixed with soil conditioner to create soil that plants like
- Fabricated soil needs to be mixed by the contractor on site or off site, prefer off site because it is difficult to find space to do it on site
- Construction workers have no respect for landscaping since they trample plants, hang stuff on trees, and spill concrete on soil, so it is preferred to have construction done before landscaping
- Currently the situation is they can transplant 1-2 trees a day and only on weekends so they can keep streets open, so they need to go parallel and plant trees alongside hard landscape work
- Client also wants to see greenery throughout process
- Short plants have mixed growing but they need to complement each other, so no fast growing plants paired with slow growing ones
- Biodiversity range of plants for the greenery, will be organising green tours
- INat take pictures of things you don't know such as animals insects and plants, and it will give you some options to understand what it is
- Planters have been replaced with Chevora abracola because you can't kill the plant because it is rugged
- In plans where that plant isn't specified, it is still planted because it is easy to care for and reduces maintenance work

- 450 mm average seating height
- Water pump has overflow so during summer months with heavier rainfall the extra water goes to the drainage system. In the winter, fountains may need to be topped up since the water is recycled, so some will evaporate
- Different tree species with different colour bands to match the overall colour theme
- Blue band, pink band, red band, and yellow band
- Landscape maintenance is done by a limited number of companies who hire unskilled workers in the industry who work for cheap rates who do not have knowledge of horticulture
- Appoint someone on Swire staff that can look after the garden and know how to look after it
- Urbis has planned a maintenance guide for looking after the garden

Interview Transcript

Project questions

Q: Can you give an overview of the development and objective of Taikoo Place?

A: The area previously housed a sugar refinery factory, so it had an existing footprint. Now, it has evolved into a business district.

- Swire is the largest property owner in Quarry Bay.

The current development plan involves converting the three main buildings from the original factory layout into triple-A commercial buildings.

- 1 Taikoo Place has already been built, and 2 Taikoo Place is currently in development. The areas between the two buildings will be set aside for landscaping purposes. The larger area will be Taikoo Square, and the smaller area will be Taikoo Garden.
- Taikoo Park was also developed by Swire to balance residential and commercial life and local biodiversity.

Swire wants to discover the baseline of urban biodiversity in the current Taikoo place. After project completion, they will reevaluate the biodiversity to see if the project has a positive effect. Then, they will propose ways to increase biodiversity in other urban areas.

Survey of Taikoo Park:

The park is bordered by Quarry Bay hillside and includes Quarry Bay Park I and II.

- It serves to increase habitat connectivity and balance urban and green settings.

Project Details:

This NBS aims to promote and increase biodiversity through strategic design.

- Biodiversity is analysed by recording the number of species in Taikoo Place over different periods.
- Two species that are rare in urban areas were recorded in the area. These two species are far more common in rural areas or ones closer to migratory bird flyways.

The design concept was planned by URBIS

- It aims to create a beautiful landscape for visitors, provide planting designs that promote biodiversity, and include a variety of species that satisfy the functional requirements for a wide range of activities at different times of day and year.
- The design utilises *Feng Shui* as well.

The redevelopment project has created an additional 26.7% outdoor thermal comfort area. People visiting will feel cooler and more comfortable

- The greenery also addresses extreme weather effects, such as severe flooding

Swire is working to create a standard for corporations to measure nature-based progress.

- This would be a useful tool for other businesses when they implement their own NBS
- It is important to connect all aspects of Swire's work, from property management to its more environmentally focused initiatives.

Q: Were any previously existing guidelines followed during the development of this project?

A: When this project began, standards still needed to be established. However, the development team was aware of the IUCN standards and considered them the best resource for planning an NBS.

- The most important aspect of an NBS is if the project addresses a societal challenge. Two Taikoo Place aims to create a better environment for residents and workers to better appreciate nature.
- Climate resilience is also addressed by the area's natural cooling system. As global temperatures rise, it is important to have public areas that remain cool.

Q: Is Taikoo Place based on any preexisting project, or is it completely unique?

A: Projects based in Hong Kong were not used as a guide for Taikoo Place. There were no similar NBS or data to reference.

- Instead, Swire sought consultation from Dr. Billy Hau to ensure the ecological aspects of this project were planned correctly. Ecosystem connectivity was a detail that was prioritised during development.

Q: Were any challenges encountered during this project's development?

A: Biodiversity is a very new concept for this project team. The team collaborates with many stakeholders to ensure that Hong Kong's biodiversity is sufficiently understood.

- Consultants and universities are important knowledge partners necessary for collaboration.
- Swire hopes this tool will provide this industry with an effective set of standards to encourage other organisations to become more involved with NBS.
    - This allows Swire to expand on what is already in their portfolio and show the public what it can do for the environment.
- Swire also follows internal guidelines that they developed for NBS projects.

Q: Are there current incentives for businesses to use NBS? Are there specific reasons for their lack of usage?

A: The Hong Kong Government intends to implement these ideas in new building projects. However, how NBS will support the public environment and social values must be considered.

Q: What has been the most effective way to communicate sustainability to the private sector?

A: Companies must realise that nature provides many things necessary to their business. Many can profit from nature, and the world's GDP heavily depends on it.

- Businesses need to revisit the linkage between nature and business, learn how to improve the environment and gain an understanding of biodiversity. This is incredibly important to nature restoration.

Q: Why did Swire choose to pursue something innovative regarding sustainability?

A: Swire hopes to be the leading global sustainable development performer by 2030. They have set many goals to achieve a great sustainable developer status.

- This is done by focusing on climate change to considerably decrease carbon emissions. Swire must be innovative in running their business, building, and carrying out projects. They are now the second-ranked sustainable developer, giving them a competitive advantage. Swire's buildings are highly sustainable, saving energy and cost. They want to continue being as innovative as possible to attract more clients.

Q: What would you say for other businesses that want to be involved in sustainable development?

A: Every company needs to understand their risks and key clients. Understanding, prioritising, and engaging other companies to follow suit suite in sustainable development is extremely important. It is also very important to prioritise assets.

Q: Is this project adaptable to climate change?

A: Swire is collaborating with others to build a climate portfolio and develop climate modelling data. The Taikoo Place redevelopment is planned to handle any predicted changes concerning climate change.

- There are low to moderate levels of risk with buildings along the shoreline due to rising sea levels or intense storms. They will identify follow-up measures as the project develops, such as requiring additional pumping and drainage systems.
- The development team plans to work with the climate consultant team to identify parameters that may change and affect development. Climate risks will become more serious. Thinking ahead on how to mitigate them will be extremely cost-effective.
- In 2017, Swire was the first company to perform this climate review strategy, giving them a good risk assessment record.

Q: What costs are associated with these projects?

A: This project is cost-conscious. There is no direct return on revenue, but these projects add value to assets. Swire wants to have a green finance framework.

Q: Are there any policies that encourage top-down change in the industry?

A: One suggestion is the Government could encourage more companies to look at their impact on nature. Nature could be considered as one of the S3 topics in the future.

- NBS is extremely important to policy development as well.

Q: Have you considered using your internal NBS guidelines to enhance your existing projects?

A: Swire has internal NBS guidelines that cannot be used for individual buildings and projects.

- This, however, is a goal that Swire has. They plan to reach this by measuring the local biodiversity baseline and continuing to reduce effects on nature by operating their buildings sustainably.

Another project example:

Swire has collaborated with Miami to preserve and help Miami's coastline.

- They proposed a promenade system that uses NBS to protect the coastline from flooding and extreme storms. It is similar to a "wetlands boardwalk" and an oyster reef. This wall is much more protective than the sea wall, creating a better environment for people to visit. This also tries to achieve biodiversity and a social goal.
- However, this project was cancelled. But they are planning on reopening this project. This is a good example of how the government and the developer can work together.

The Nature Conservancy: Oyster Reef Restoration

Background Research

Project: Oyster Restoration

- Oyster reefs are THE MOST endangered marine habitat on the planet with 85% global loss
- Two pilot oyster reefs in Lau Fau Shan and Tolo Harbour are using discarded shells.
- JP Morgan & Swire Institute of Marine Science of the HKU
- Oyster and shellfish provide many benefits: natural filter feeders that improve local water quality, and stabilise shorelines. One oyster can filter two hundred litres of water a day.
- Questions:
    - How did you acquire these partners?
        - What attracted them to invest in the project?

Site Visit Notes

Ha Pak Nai

- Restored 5000 m^2 of absorbed oyster farm into oyster reef habitat

Shenzhen River Bay

- Oysters cannot grow in too salty water and that is closer to the Shenzhen port is not able to flow as much. With less rain and less river flow, people want to use the less salty area of the river to grow oysters because oysters die in too salty
- They are also not selling as many oysters right now, so they need to put them in the freezer and take them out and it is losing value as they shrink and go not golden

Maritime Museum

- Main reasons for reef destruction
    - Land reclamation and development
    - Pollution and climate change
    - Overharvesting
    - In the past lime is made from burning calcium carbonate materials like oyster shells for building materials

Sai Kung Fish culture

- Collecting oyster shells from restaurants and fishermen to build oyster reefs

- Oysters can cycle nutrients in the water to combat too many nutrients in the water that lead to oxygen crashes and then fish kills
- Just oyster shells degrade, so need limestone base surrounded by shells for more baby oysters
- Baby oysters to want to attach to calcium carbonate and more complex structures for more shelter.
- Restaurants are not paying to dispose of their shells because they think TNC wants the shells, but it is not economically viable this way

TNC

- Oysters population have declined massively due to developments and they are the most engaged red marine habitat
- All of the HK harbour used to be oyster reefs in both sides and it was all destroyed due to developments
- oysters are important other than food they filter two hundred litres of water a day.
- The reefs have been destroyed due to overfishing and using their shells for construction due to the calcium carbonate
- The project seeks to quantify and understand the oyster reef ecological benefits and to restore the shellfish reefs in Deep Bay in northwestern HK
- 2 pilot reefs have been made with discarded shells.
- Monitoring is ongoing for data collection and restoration method developments for scaling up in the future
- Oyster population has increased

Interview Transcript

The Nature Conservancy Interview Transcript

Introduction:

Mr. Felix Leung studies climate change in Hong Kong in order to make policy recommendations to the government including NBS. Currently, he is working with TNC on the Oyster Reef Restoration project. Oyster farming uses concrete poles in the mud. Oysters attach to the poles, and when they mature, they are harvested. TNC wants to maximise the ecosystem of the oysters, doing so by moving the farms closer to the sea in deeper areas.

Climate Change Impact and Nature Risks:

What has caused the loss of oyster reefs?

Multiple factors contribute to the loss of oyster reefs. Climate change has made it difficult for oyster reefs to thrive due to environmental changes. Also, people use oyster shells for construction as well as for food. Another big factor that contributes is that oyster reefs are not considered a marine environment to protect, therefore, developments along the coast have destroyed many oyster reefs.

Definition and Role of NBS

Did you use any guidelines or standards to develop this project? If not, what were the challenges you had to overcome?

The term NBS has evolved. Initially, it was considered ecosystem function, then natural capital, and now NBS. Natural capital refers more towards the management term of ecosystem function. The current term of NBS is more for societal benefit, not just carbon costs and financial gain.

Project:

Oyster reefs are the most endangered marine habitat. TNC began the oyster reef restoration initiative, and a part of this project is cleaning out an abandoned oyster farm that is polluting the mudflats. The project as a whole takes a holistic approach in which they aim to help the local economy, educate the public, improve the environment, and create awareness. Awareness is especially important since many people in Hong Kong need to learn about the importance of oyster reefs.

The abandoned oyster farm is made up of large, heavy concrete poles about a metre long. Digging them out of the ground and piling them in another location is difficult. The volunteers also aid in removing invasive grass species from the mudflats. Oyster farms have been in the mudflats for centuries, but only ten years ago when the invasive grass was identified as a threat. They gain help from volunteers and support from the private sector. The volunteers are primarily from corporate volunteering programs and the private sector donates money to fund the project's work. Felix mentioned that the project could expand with the right policies and partners.

The Oyster Reef Restoration project not only cleans out the abandoned oyster farm but also creates new environments for oyster reefs to grow. There are floats in the ocean before the mudflat in which oysters grow. This is more effective than the concrete poles since it's deeper in the sea. However, when a typhoon hits, these floating farms can break pushing the debris into the water, which is not good for the environment.

A significant challenge with this project is that the mudflat area is a tourist spot for viewing the sunset. When tourists come, they damage the environment by picking oysters and mussels, which is not sustainable. Another challenge is that they do not own the land, so TNC must engage with the community to carry out the project. Additionally, the area itself is not protected by the Government, so TNC is doing conservation work on it.

Areas of Opportunity:

TNC and Felix work diligently to push for policy changes. They want oyster reefs to be recognised as a habitat for conservation. The Government needs to assess the locations in which they plan to create developments. However, unlike coral reefs, oyster reefs are not recognised as a habitat for conservation. To support these policy advocacy efforts, TNC has allied with the Marine Protection Alliance (MPA). In this alliance, multiple NGOs and academics work together to increase the marine protected areas in Hong Kong. Another approach to these policy advocacies could take a financial route, in which throwing out rubbish could be taxed to encourage recycling and reduce pollution.

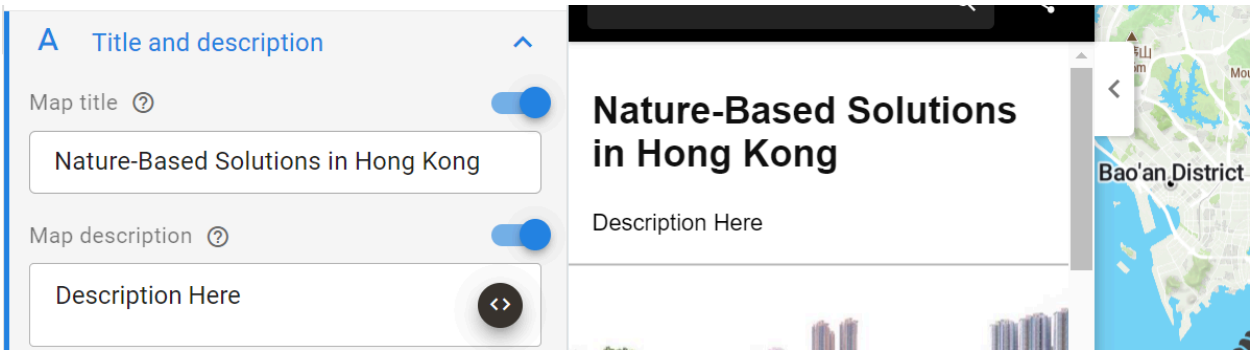
The project itself has additional areas of opportunity, such as its partnerships with local fish farmers and hotels and restaurants that utilise oysters. TNC collaborates with several restaurants and hotels to collect used oyster shells and implement them in their oyster farm in Sai Kung. They receive significant tourist engagement, as they can provide tours to educate people on oyster awareness.

User Guides

Mapme User Guide

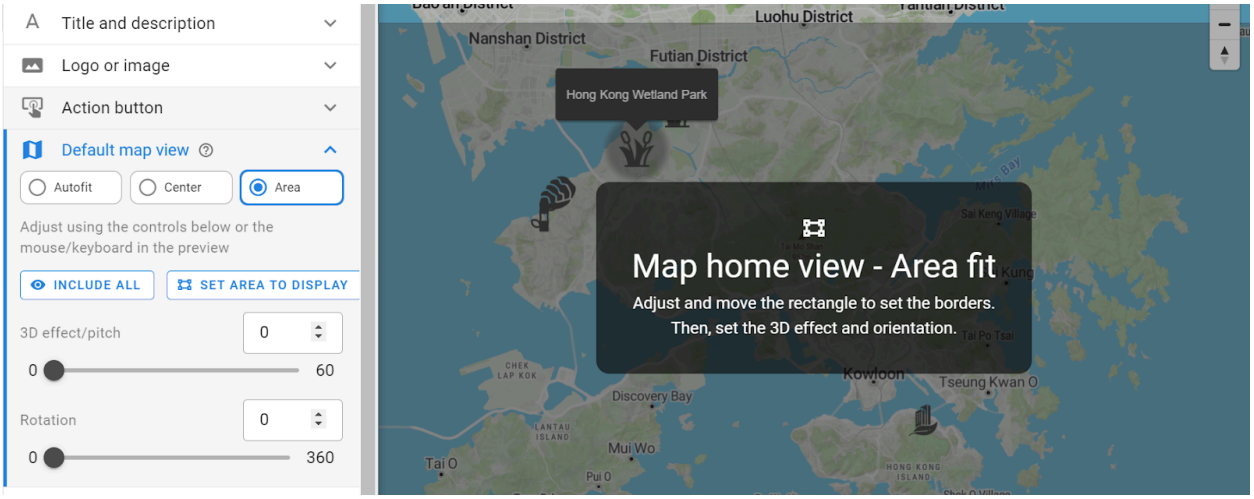
Map Home

Title and Description



- Title and description can be toggled on and off. The description can be customised more by clicking the  button to enter HTML mode. Refer to the process in Locations for how to easily add customised formatted text in HTML.
- The title and description are shown at the home sidebar of the map.

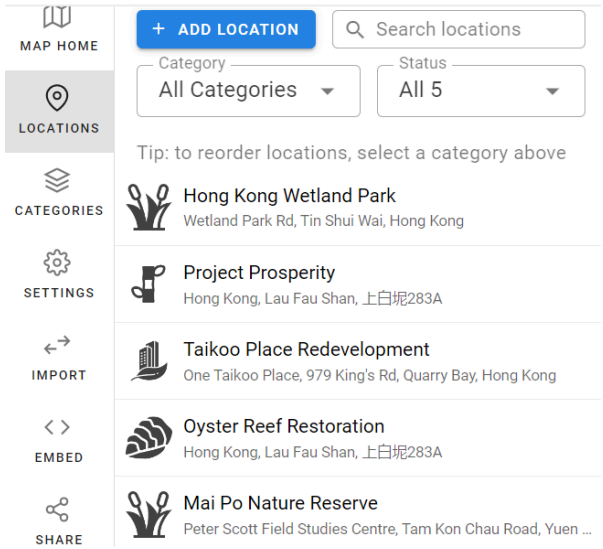
Default Map View



- Autofit - shows the most zoomed in view where all locations are viewable
- Center - puts the map view surrounding the center location at a certain zoom level. The 3D angle and rotation of the map can be adjusted
- Area - can size a rectangle to view the default zoom level of the map by dragging the edges. Enter mode with “Set Area to Display” button. The 3D angle and rotation of the map can be adjusted.

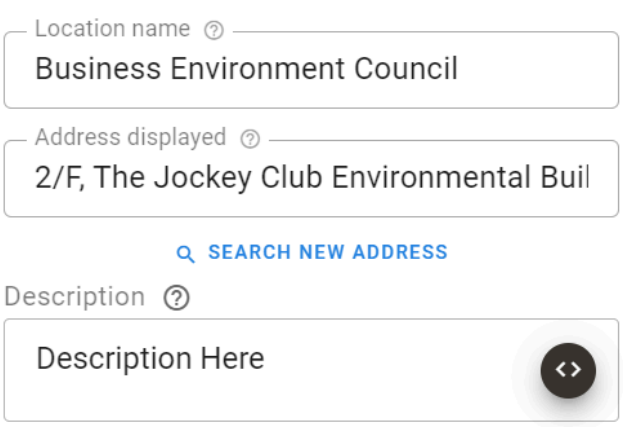
Locations

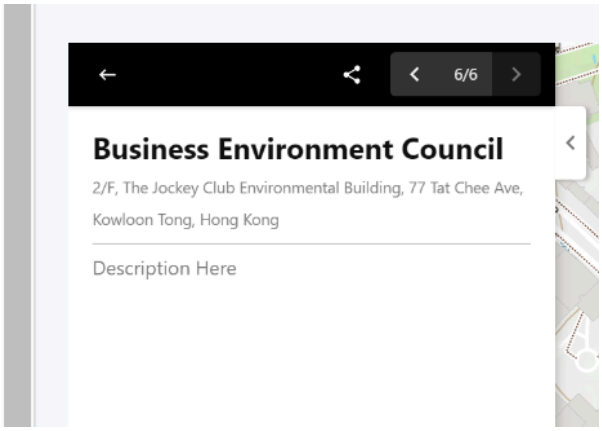
Creating new location



- Add a new location by clicking the blue "Add Location" button.
- Then enter the address of the location. If the location is not at the exact address, the marker can be moved.
- Select one of the 3 categories of NBS the project calls under: Management, Restoration, or Protection

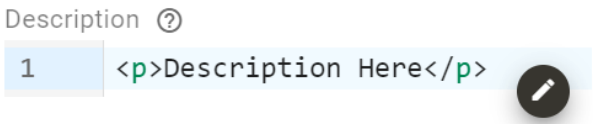
Editing Locations



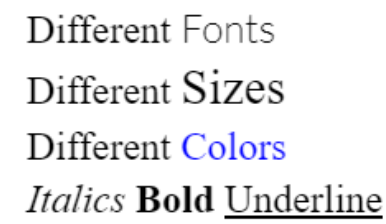


- Location name and Address displayed are all auto-filled after selecting the location, but both can be changed. The text colour and font size cannot be changed, however.
- The description can be customized more.

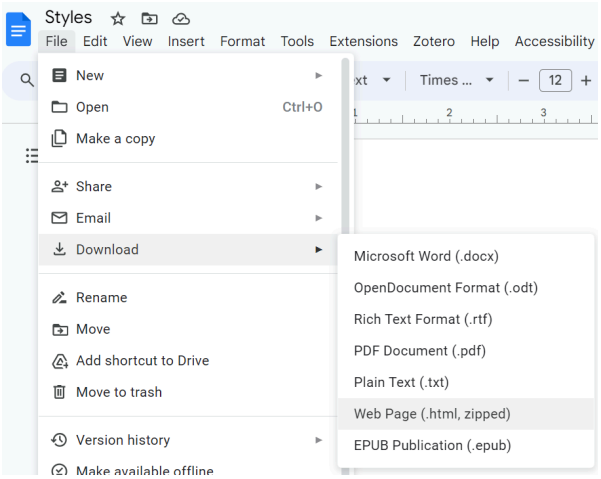
Editing Descriptions with more Style



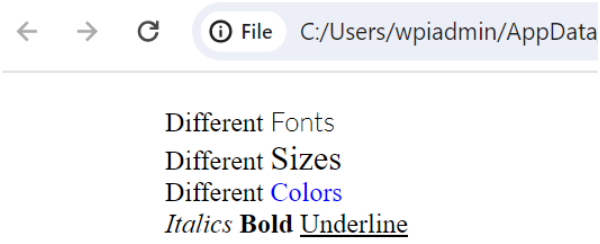
- Click the  button to enter HTML mode



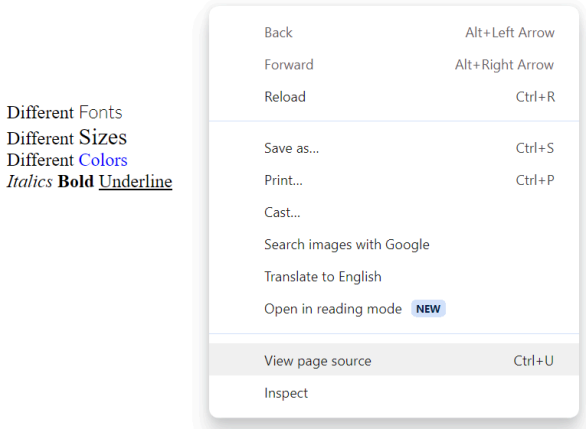
- Open up an empty Google Docs and write in text with the desired font, colour, and size.



- Download the file as an HTML file by going to **File, Download,** then **Web Page (.html, zipped)**

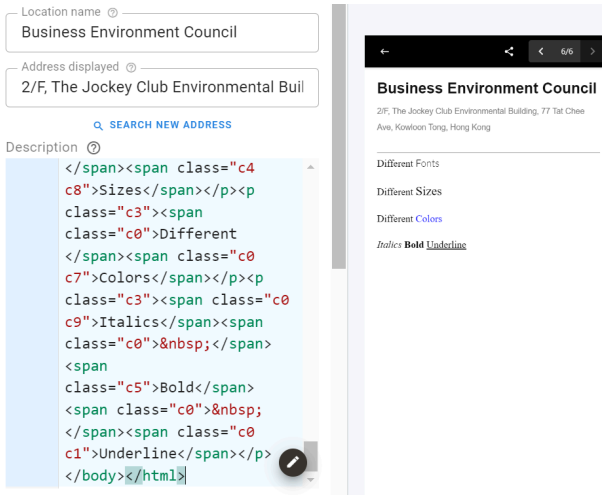


- Open the document in **Google Chrome** or another web browser



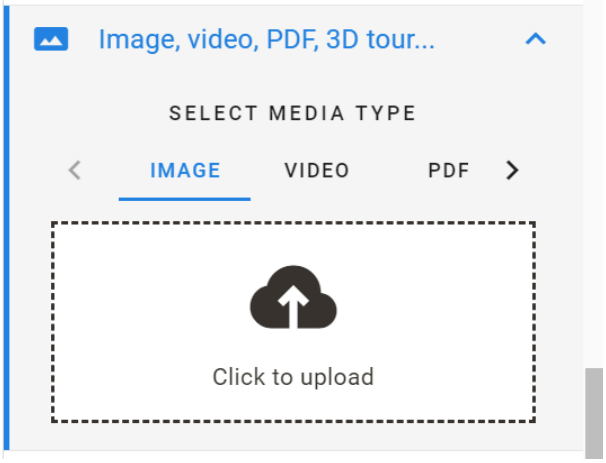
- Right click and go to **View page source,** or hit **Ctrl + U on Google Chrome**

- Hit **Ctrl + A** and then **Ctrl + C** to copy all of the code



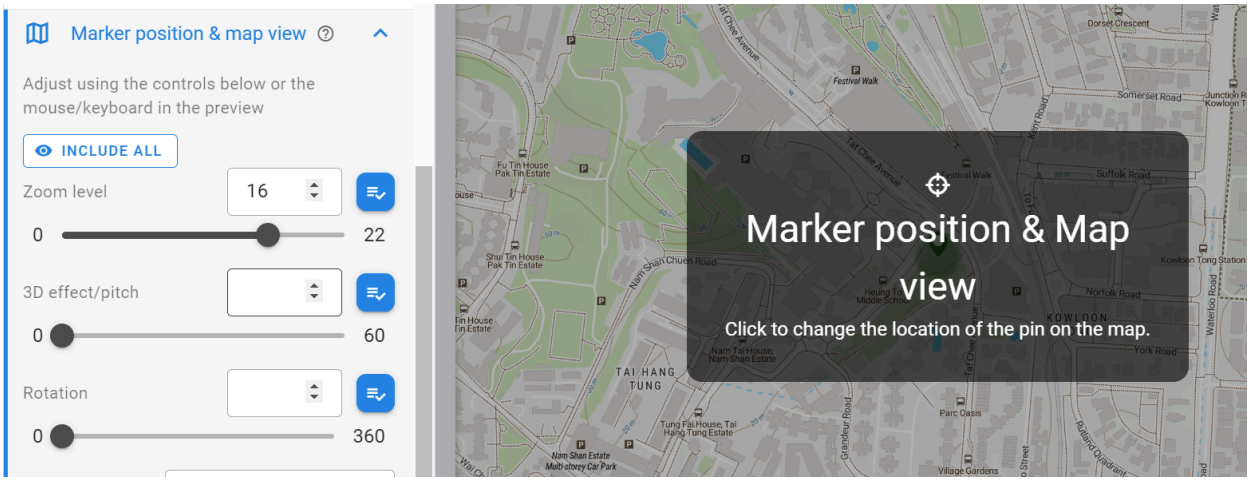
- Go to the description, hit Ctrl + A and then Ctrl + V to paste in the code
- The newly formatted text will show up in the description
- This will allow you to write and format everything in Google Docs and directly transfer the text with the same formatting to Mapme

Image, video, PDF, 3D tour



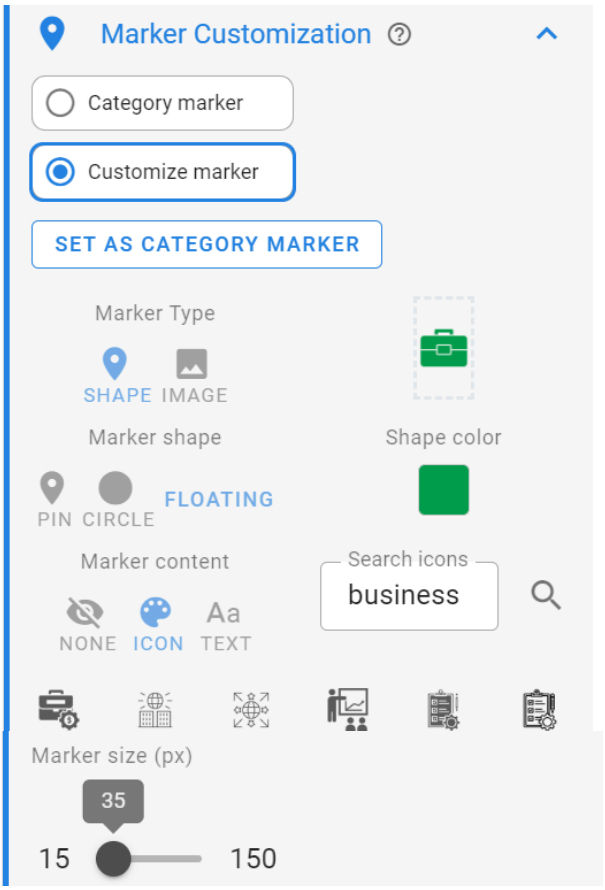
- Images of the project site can be uploaded here to be displayed at the top

Marker Position & Map View



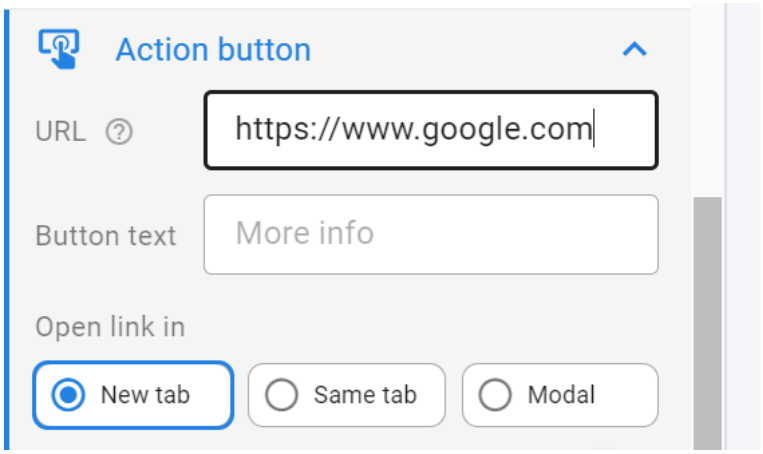
- If the specific address is not the location of the project, click the map and drag the marker around to move to the desired location.
- The map view when going to the marker can be adjusted with sliders on the left, such as the 3D effect or rotation of the map.

Marker Customization



- Select **Customize marker**
- For **Marker Type,** select **Shape**
- For **Marker Shape,** select **Floating**
- For **Marker Content,** select **Icon**
- Icons for the marker can then be found with the **Search icons** box, and any icon can be selected from below
- The **Shape colour** and **Marker Size** can then be adjusted as fit

Action Button



- The link to the informational website for the project site can be entered here
- Link must start with https://
- Open link in **New tab** is most likely best option for website

Additional Information

- Delete any locations with the DELETE LOCATION button at the bottom
- Locations can have multiple category assignments, such as if a project falls under both Restoration and Protection

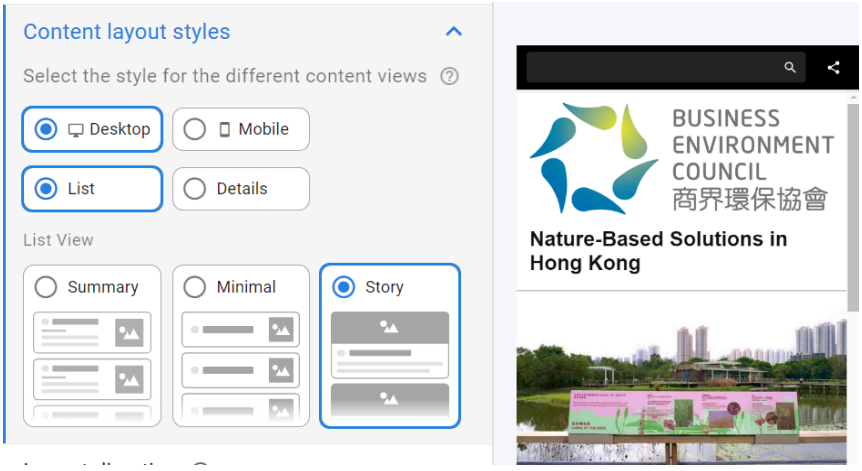
Categories

- Current categories are the three main branches of NBS: Restoration, Protection, and Management.
- Category markers have the same settings as location markers
- Sorting of locations in the main list are based on category sorting. Locations within the same category can be sorted by going to **Locations** and then the **Category**. Therefore, overall, projects in different categories cannot be mixed together.
    - If you want a particular location to be at the top, switching the order of categories does not seem to affect the order of projects so you may need to delete the categories above the current project's category. Then you need to recreate the deleted categories which will then be below the project you want to be at the top.

Settings

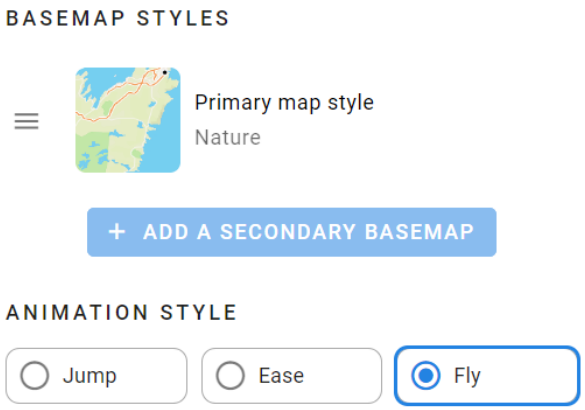
Layout

Content Layout Styles



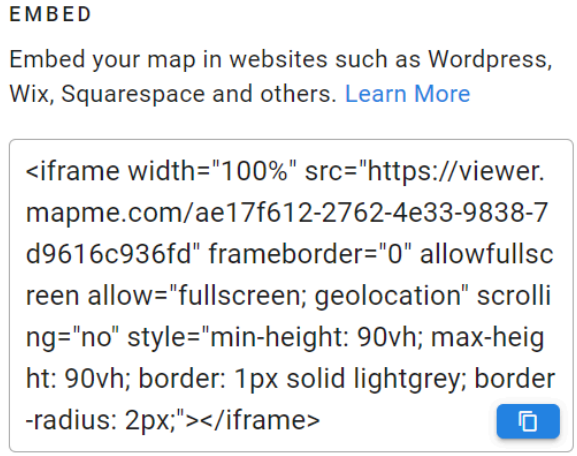
- Main list layout can be altered depending on what visuals are desired
- Details layout changes the location of images for each project

Basemap Styles



- Can change the primary map style to different maps. The current is set to Nature.
- Animation Style changes the transition to different locations. Currently set to fly for smoother movement.

Embed

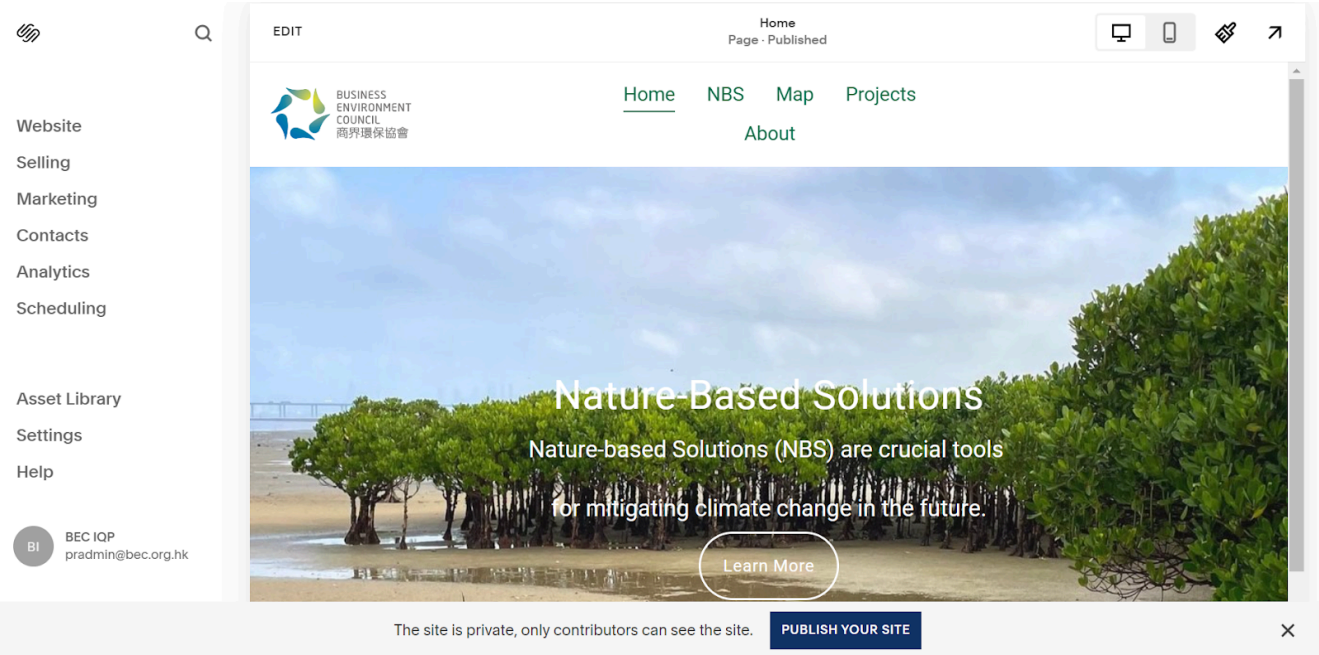


- Copy the text in order to embed the map into websites such as SquareSpace.

SquareSpace User Guide

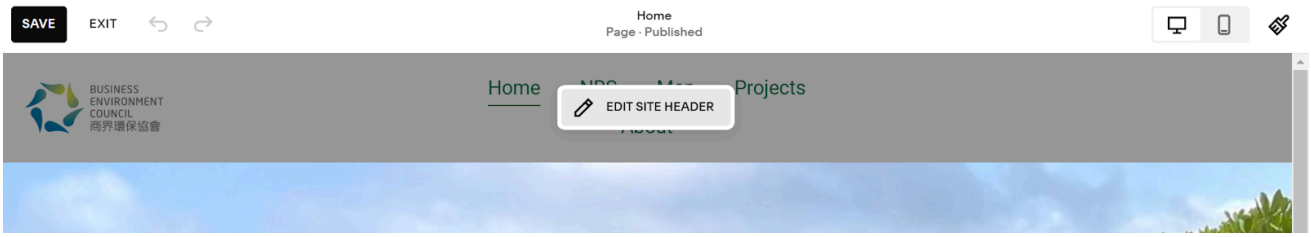
Home Page

Site-Wide Editing

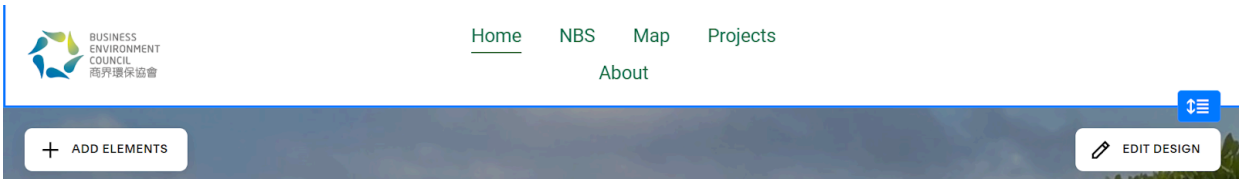


- Upon logging into Squarespace, this is the page that will be visible.
- To begin editing, press the “Edit” button in the top left corner.

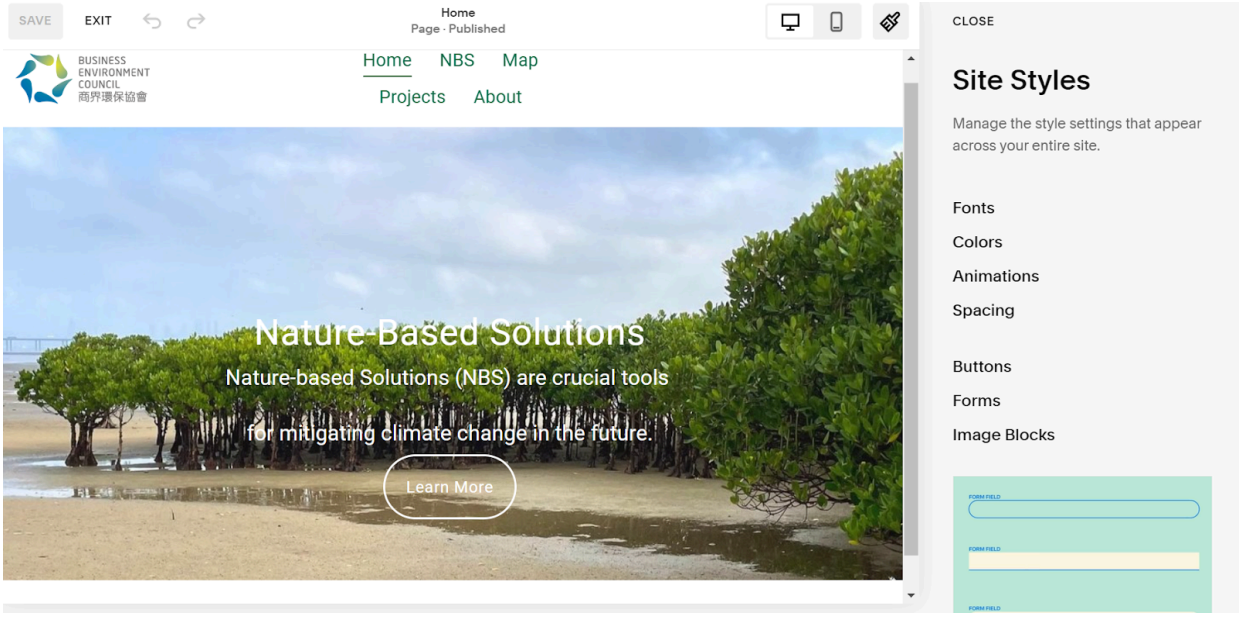
Site Header



- By selecting the header of the site the “Edit Site Header” icon will appear

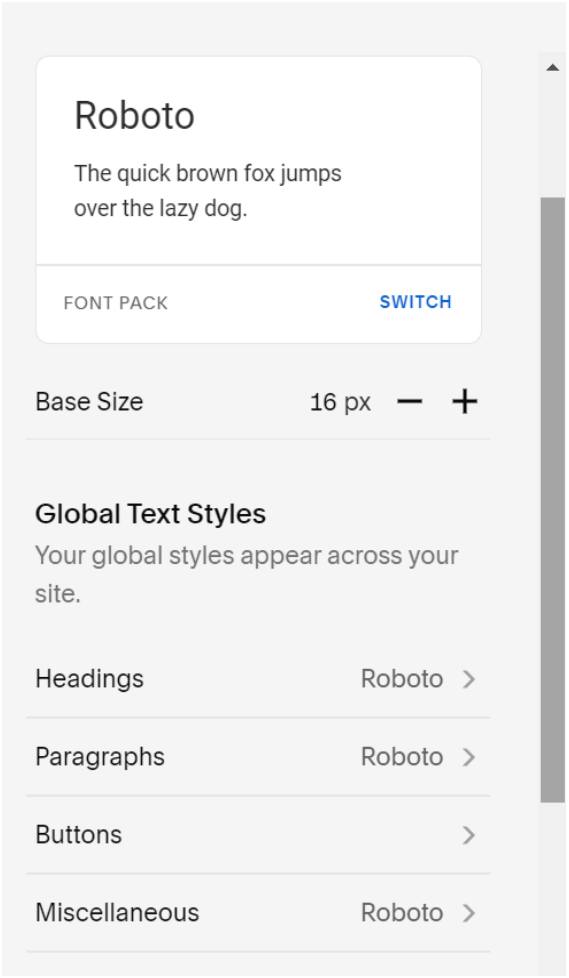


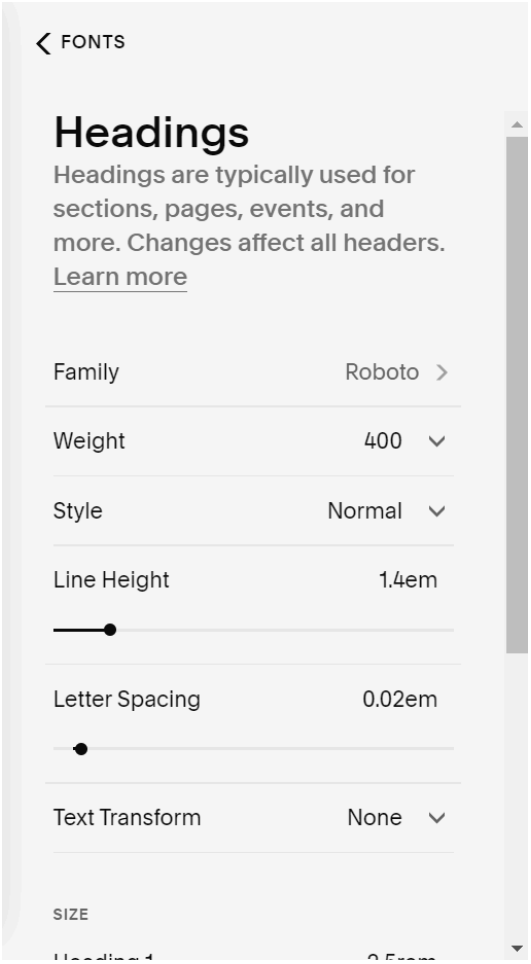
- After selecting “Edit Site Header” the “Edit Design” section will appear, this will allow logos and colours to be altered
- The “Add Elements” option will allow for more functions to be added to the header



- Squarespace has many functions to adjust the site-wide styles, which can viewed in the top-left corner using the paintbrush icon.

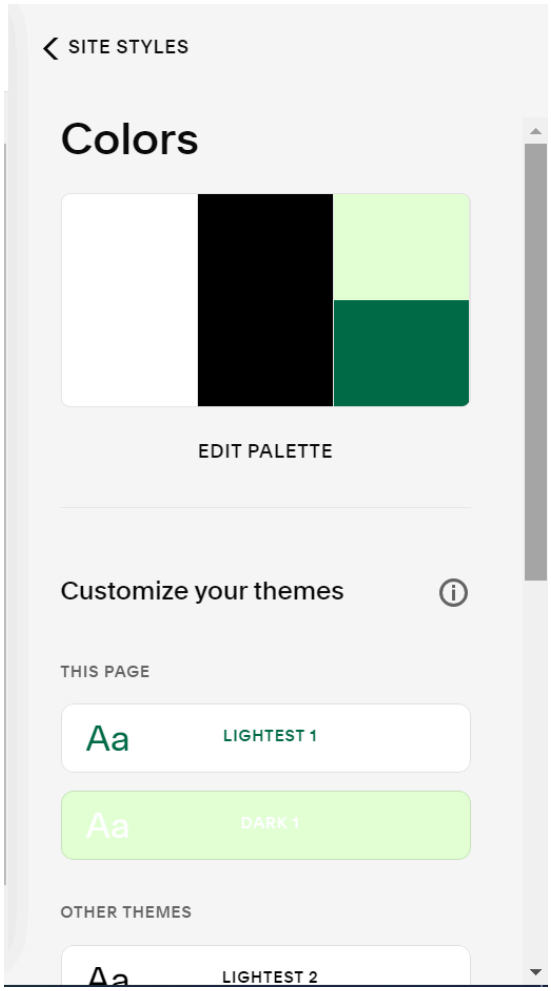
Fonts

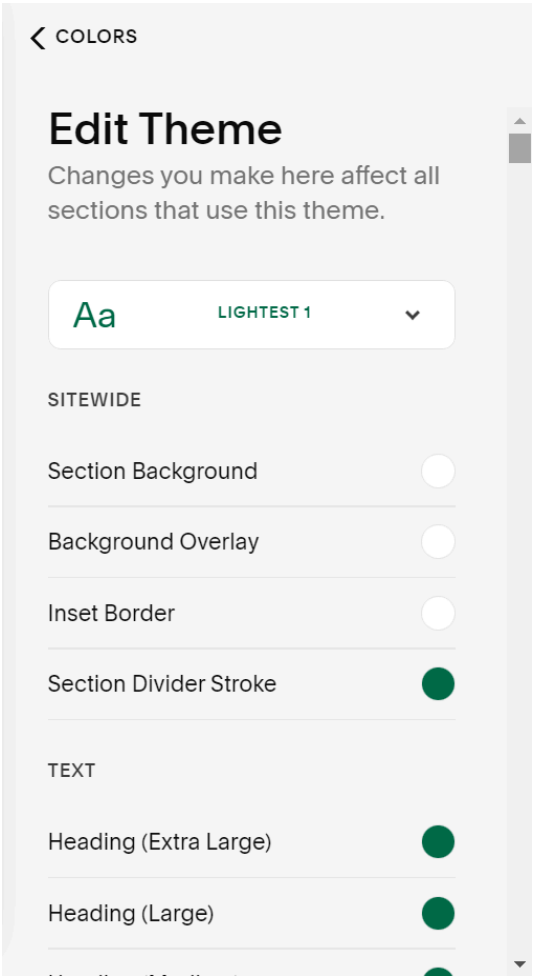




- After selecting the “Fonts” section under site styles the default font size and style can be selected for each section.
- To adjust the font weight, and more detailed spacing and sizing for a section click the option to adjust the section that should be changed.

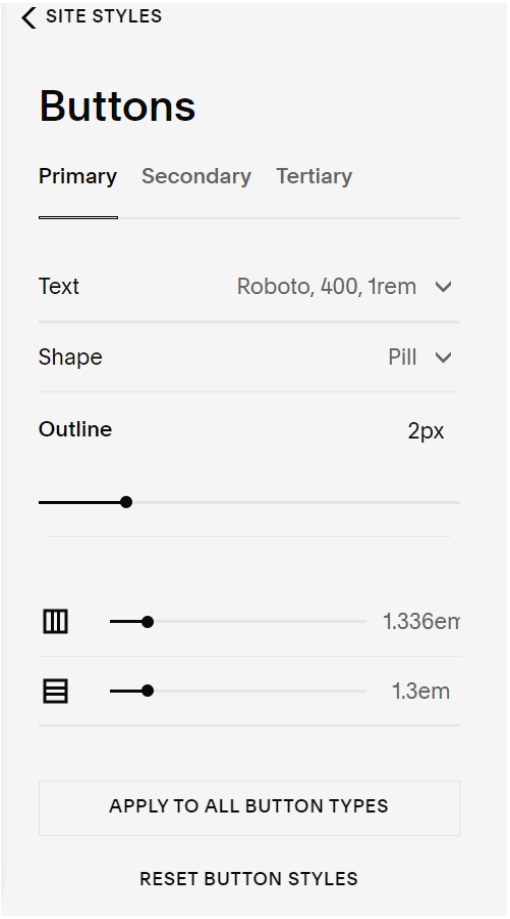
Colours

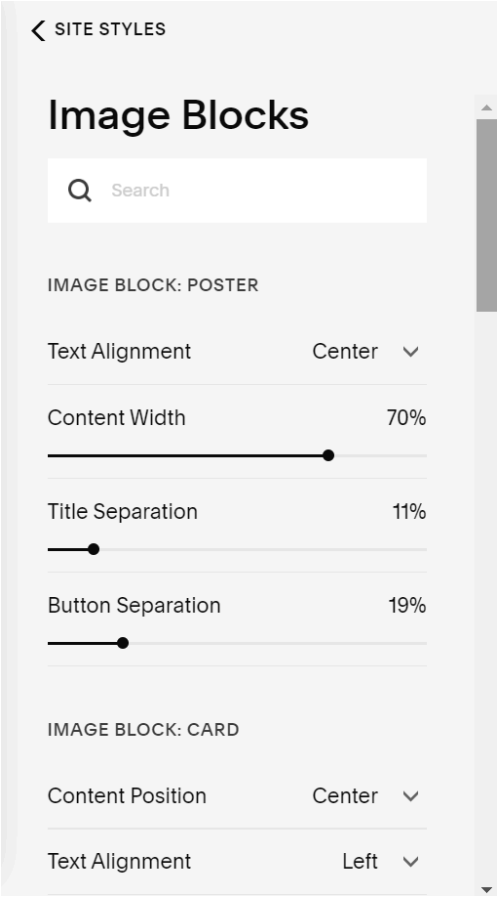




- The example “Headings” section displays the options for adjusting text on the website.
- After selecting the “Colors” option the site-wide colour palate can be edited, as well as the themes that can be made from them.
- Once selected, the colour of each type of element and text box in a theme can be adjusted.

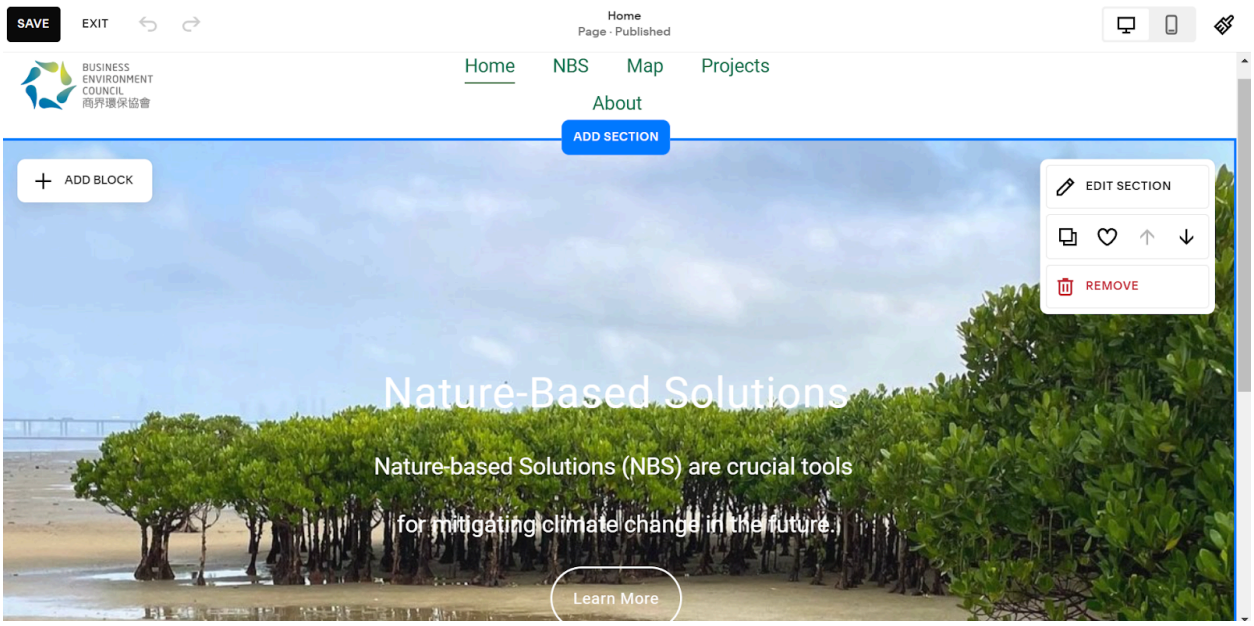
Buttons and Image blocks



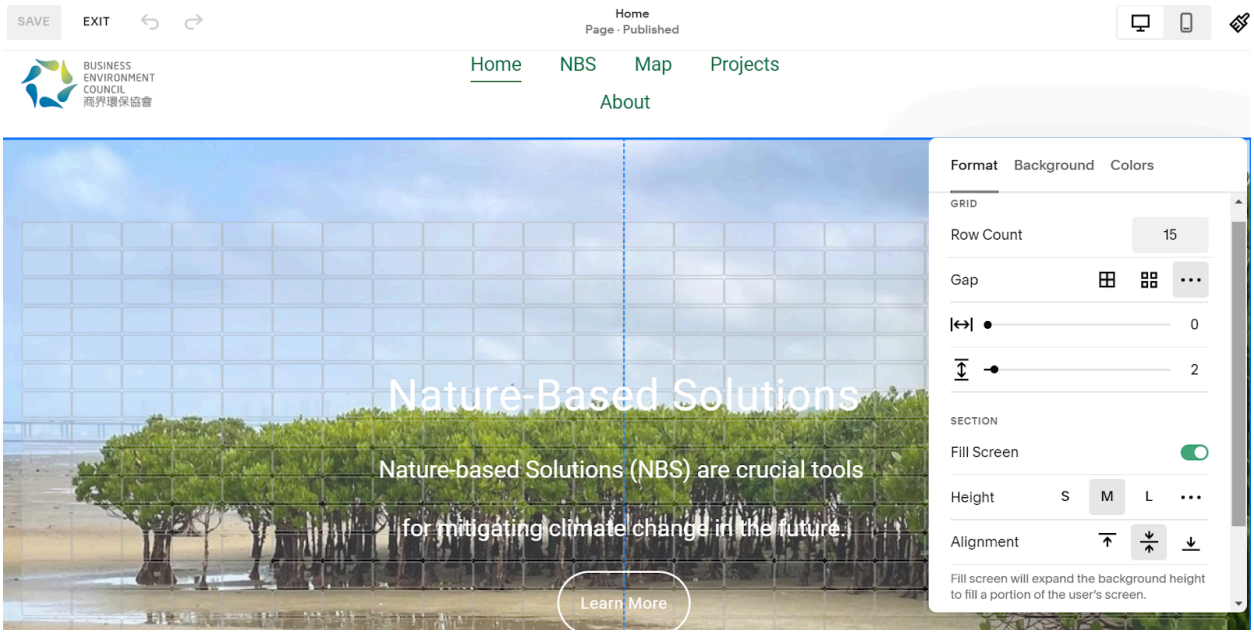


- The page visible after selecting the “buttons” option is on the left
- Three different styles of button can be edited and managed by selecting the “primary”, “secondary” or “tertiary” tabs.
- Image block settings can be viewed on the right, these settings can be adjusted after pressing the “image blocks” option in.

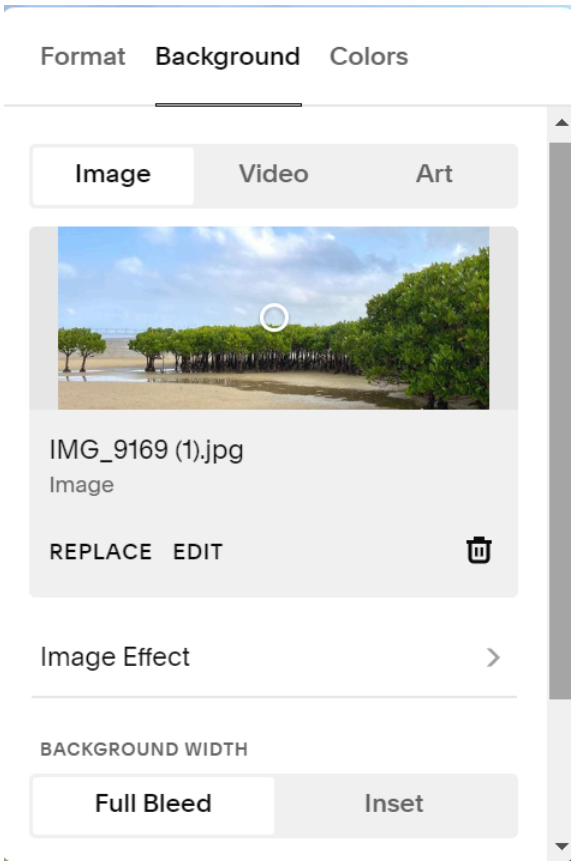
Editing Sections

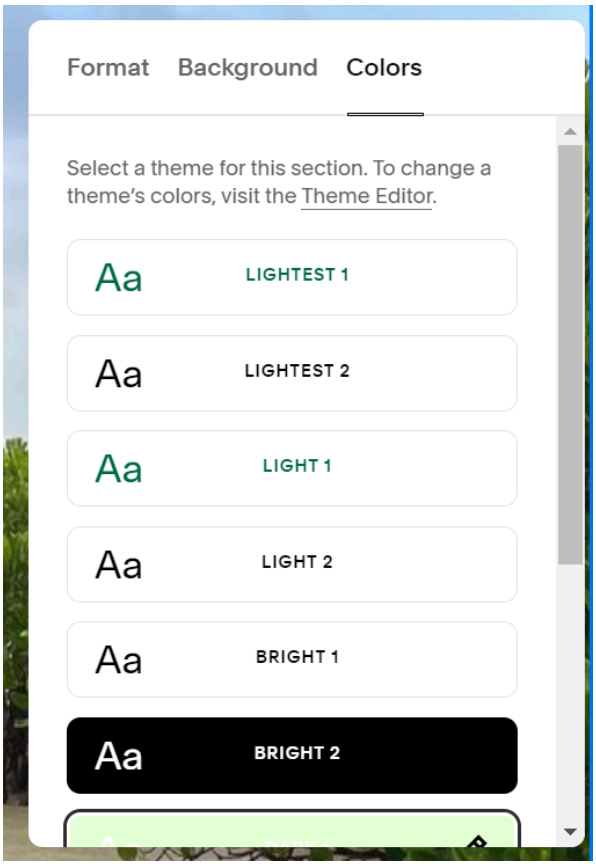


- To edit a specific section of the website select it and press the “edit section” option.



- After selecting “Edit Section” the format, background, and colours can be adjusted using the tabs in the menu that appears.
- The rectangles seen are the rows that aid formatting and allowable spaces for blocks and text to be- this can be managed using the “Row Count” option.

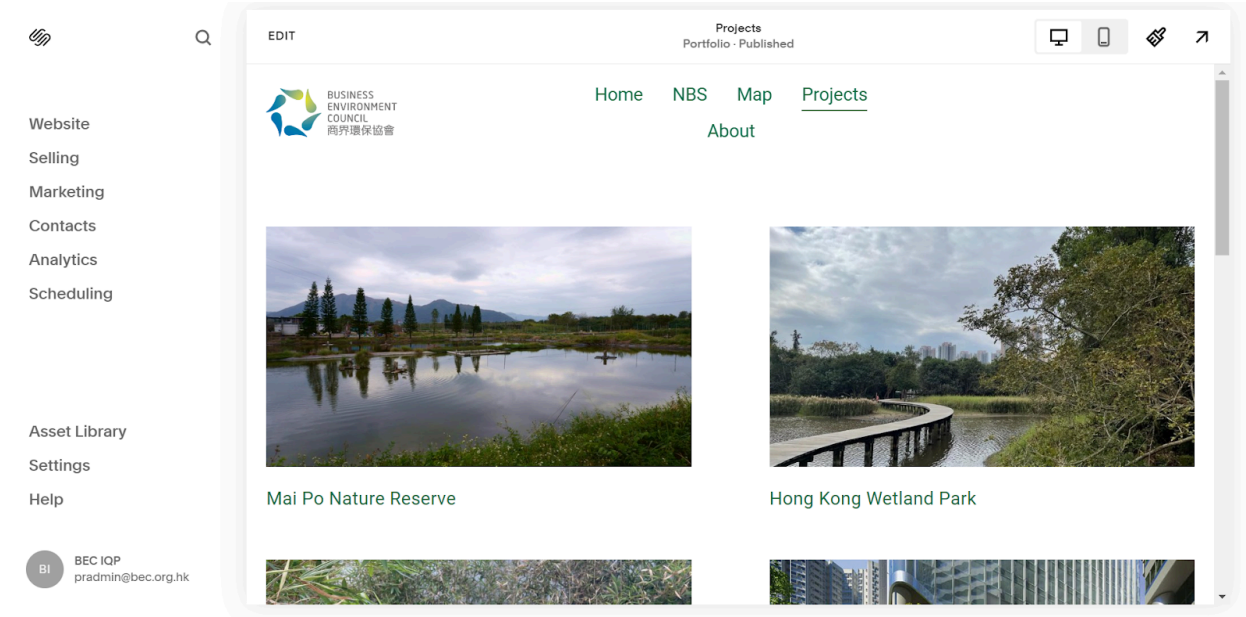




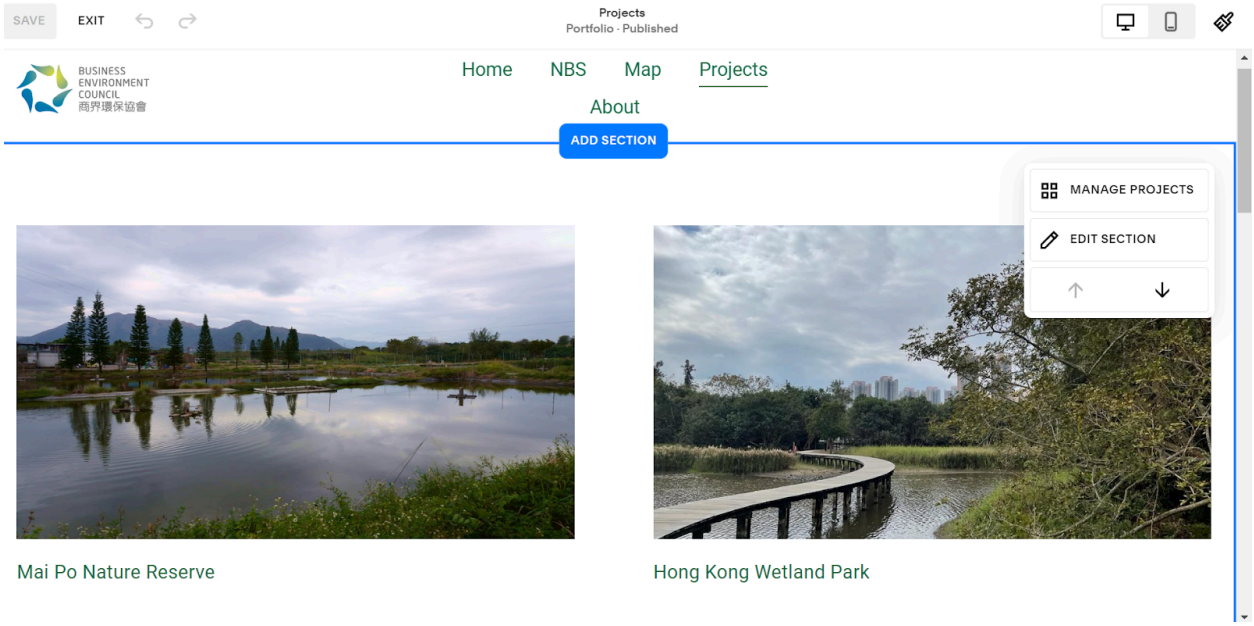
- The menu for the "Background" and "Colors" sections are visible here.

Project Pages

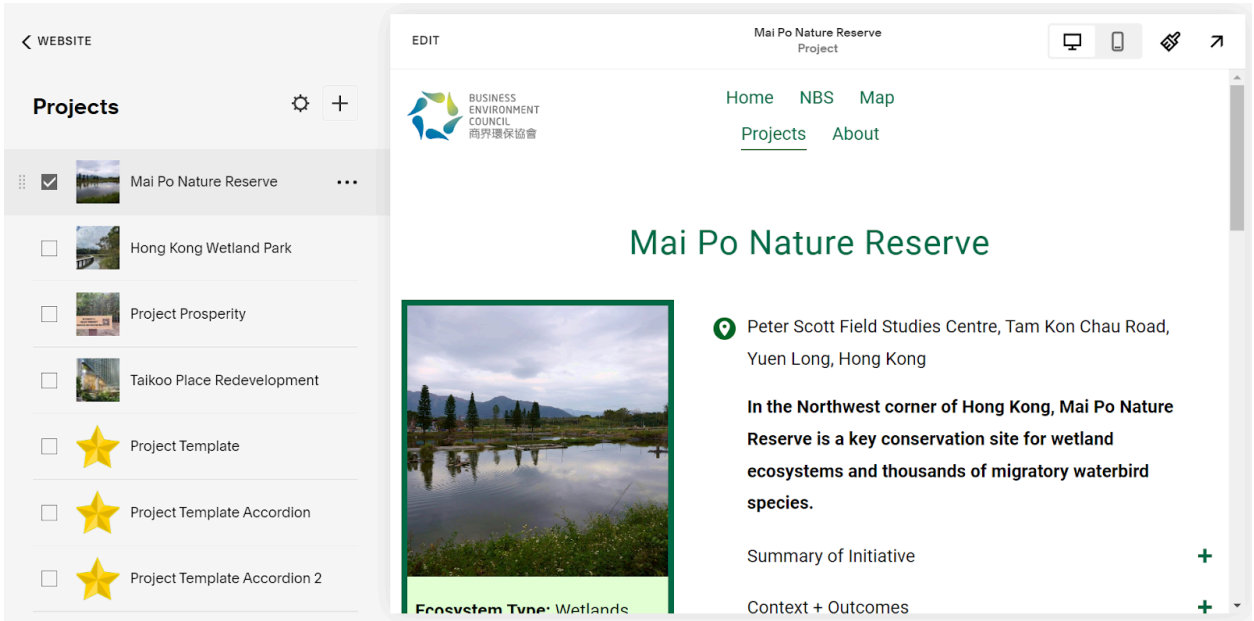
Display Page



- After Switching to the “Projects” tab the “Edit” button in the top left corner should be selected.
- Once on the edit page, upon selecting the block the “Manage Projects” and “Edit Section” options will

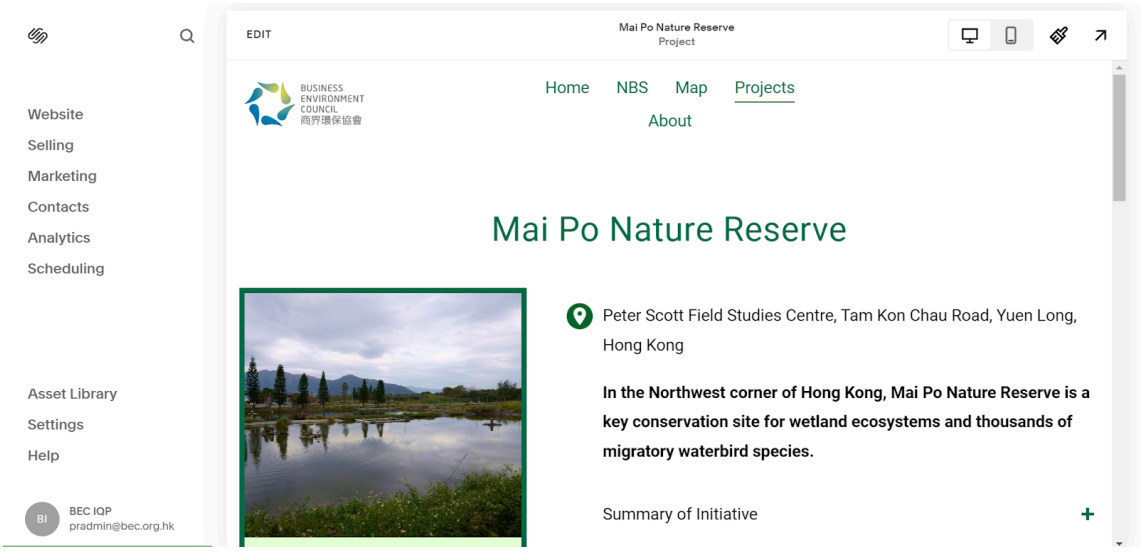


appear

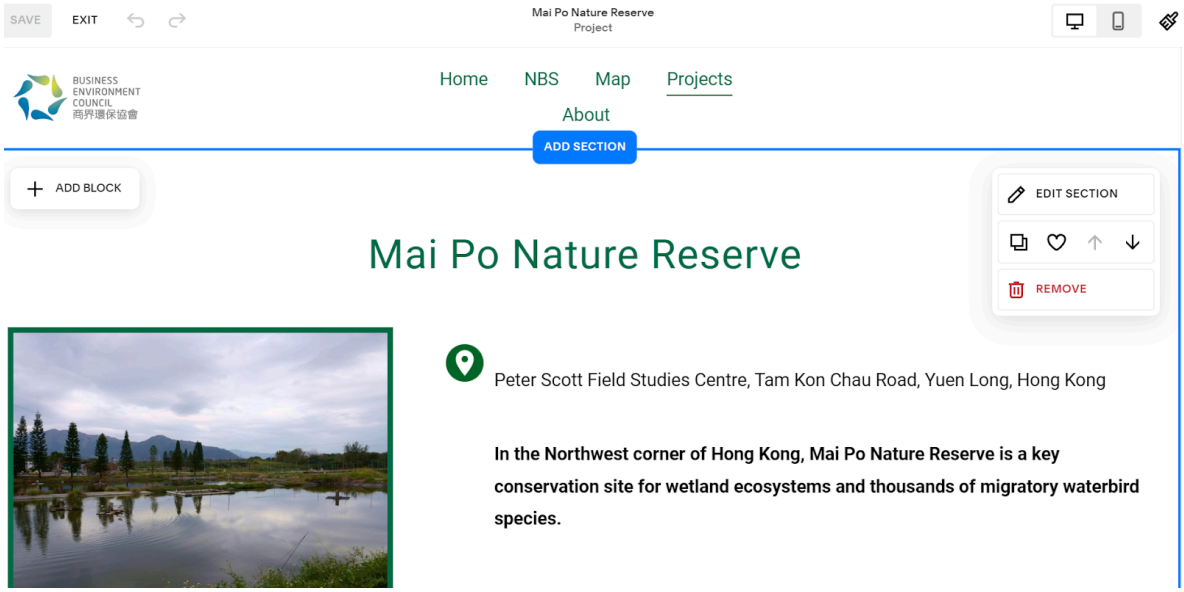


- The “Manage Projects” page leads to a checklist menu where projects can be selected and settings can be adjusted

Editing Projects

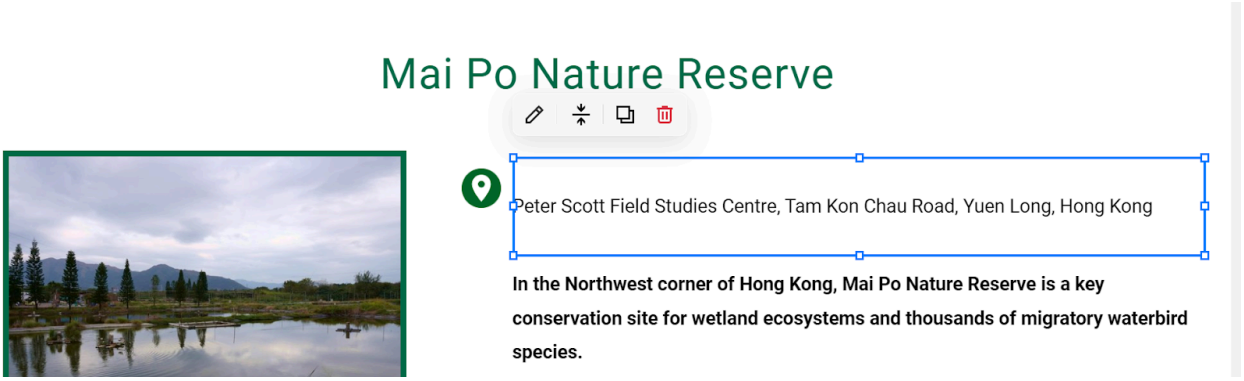


- To edit projects, navigate to the page of the project that needs to be altered and select the "Edit" button in the top left corner



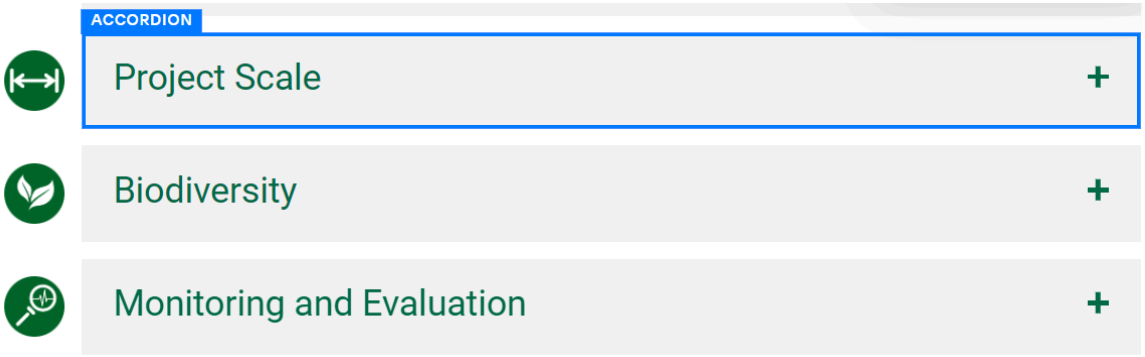
- When selecting a section the "Edit Section" and "Add Block" buttons will be visible

Text Boxes

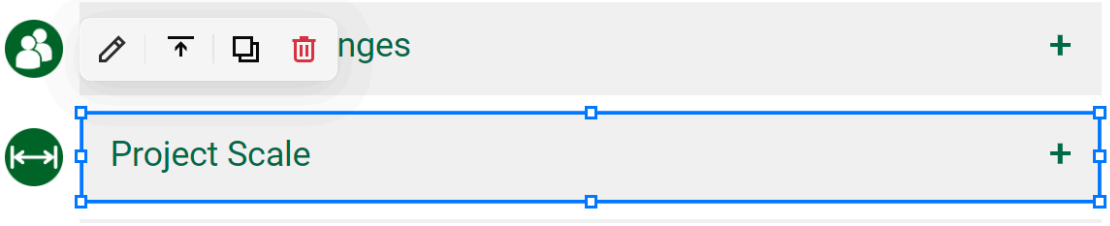


- Text can be altered by selecting a text box.

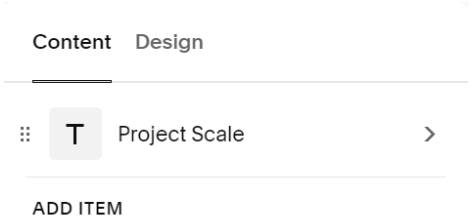
Accordion Blocks



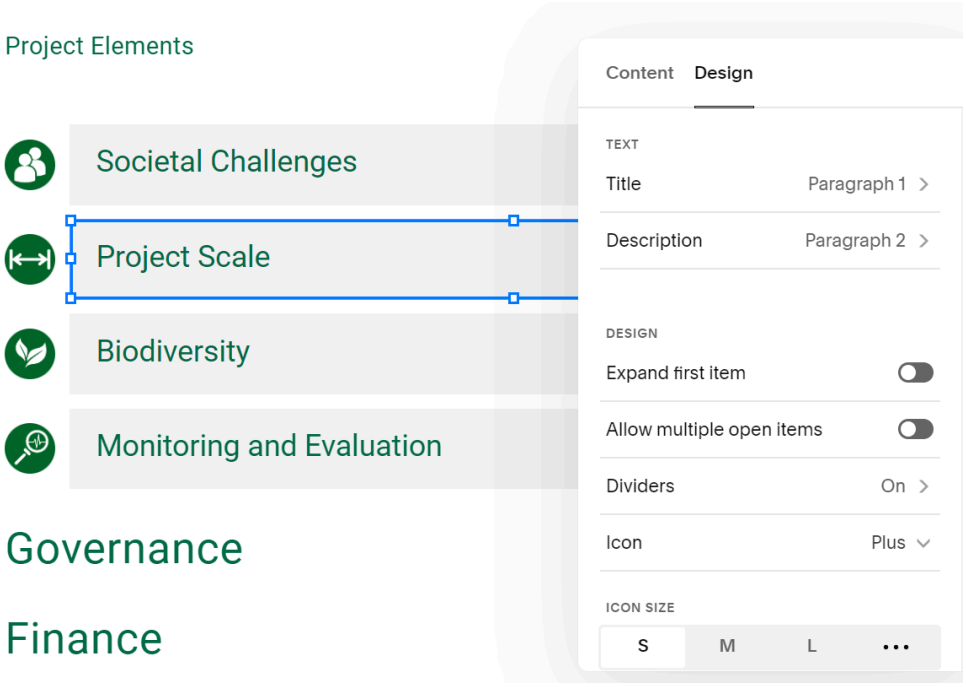
- Accordion blocks are a special kind of block and can be edited by selecting them.



- The pencil option will allow further edit options for the block

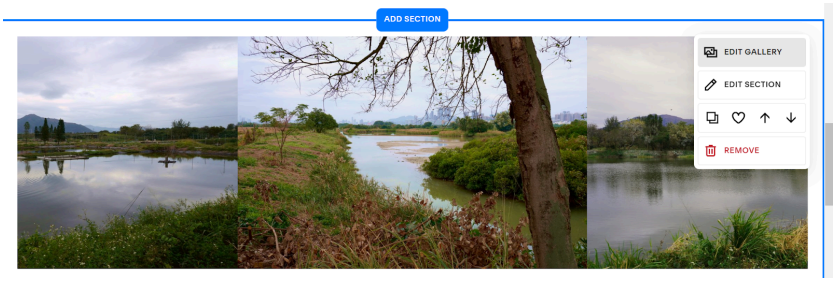


- The title of the block can be selected in the “content” section



- The “Design” section allows for more in-depth editing to be done

Images



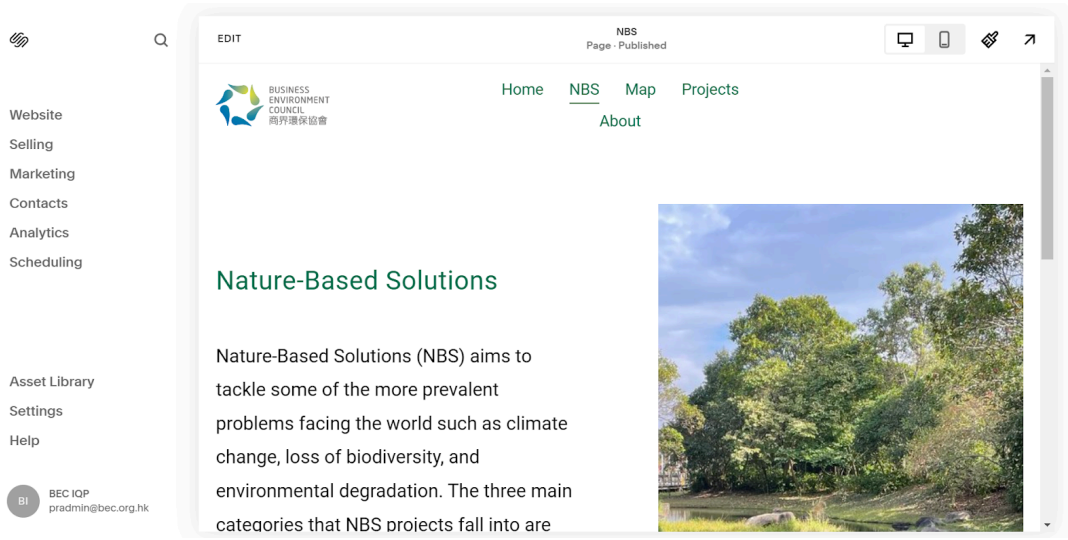
- Images on the project page can be changed and editing using the “Edit Gallary” option

Miscellaneous

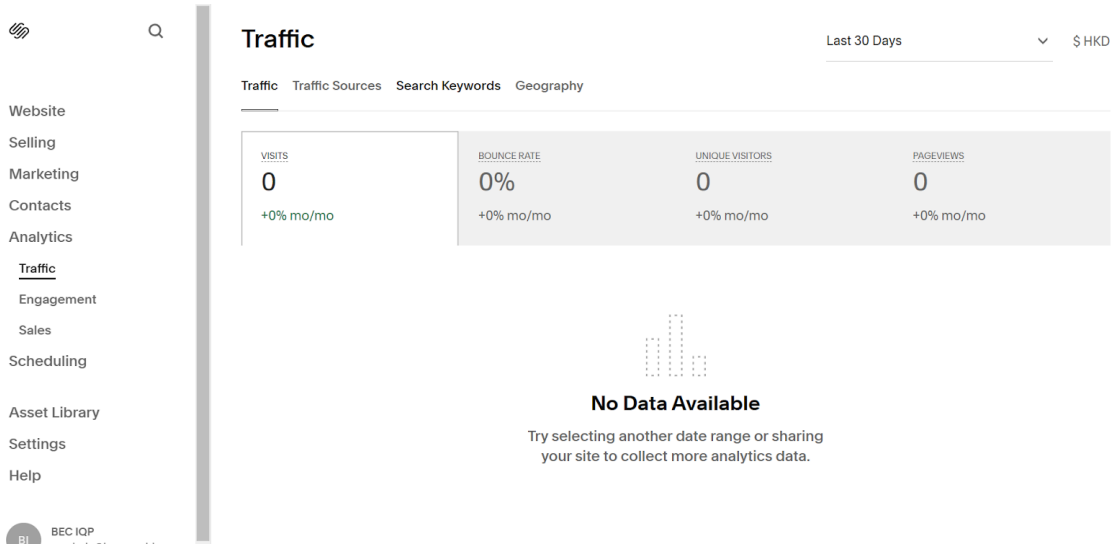
Saving Edits

- Edits can be saved by clicking the “Save” button
- To exit editing after saving select the “Exit” button

Analytics

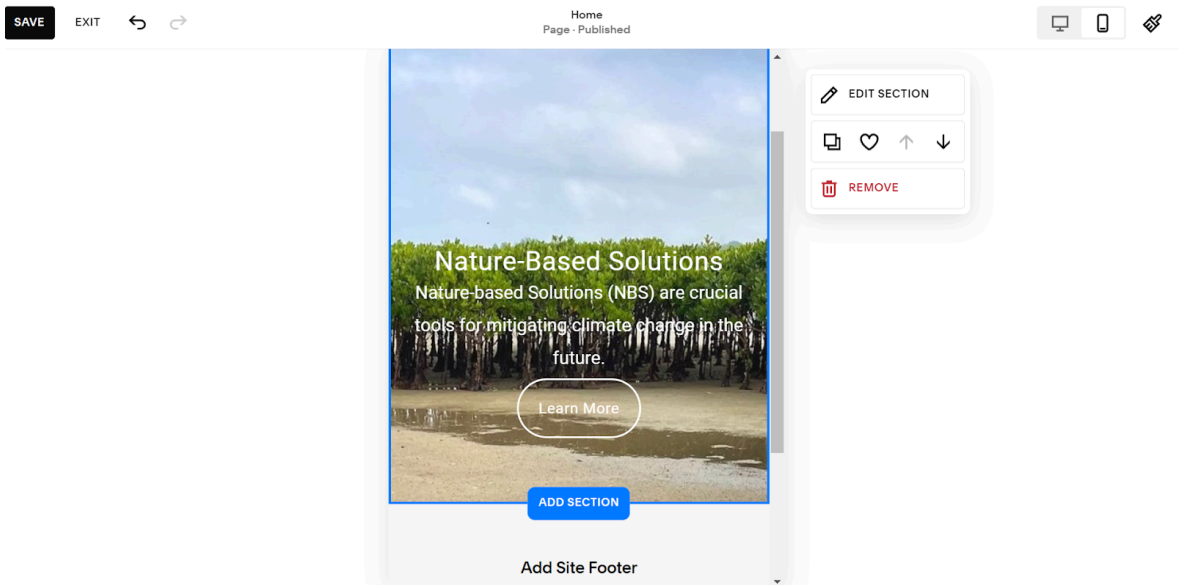


- When viewing the website in Squarespace the left side has a drop-down menu.
- Select the “Analytics” option on the menu



- Once the website is published this page will allow the traffic and engagement with the website to be monitored

Mobile View



- The phone icon in the upper right corner will allow the website to be adjusted for mobile view

IUCN Rubric

ICUN Criteria:	IUCN Guidelines:	Y/N?	Notes:
#1 NBS effectively address societal challenges			
	Prioritizes the most pressing societal challenges for rights-holders		
	Societal challenge(s) addressed are clearly understood and documented		
	Periodically identifies and asses human well-being outcomes		
#2 Design of NBS is informed by scale			
	Design recognises and responds to interactions between the economy, society and ecosystems		
	Design is integrated with other complementary interventions and seeks cooperation across sectors		
	Design incorporates risk identification and risk management beyond the intervention site		
#3 NBS result in a net gain to biodiversity and ecosystem integrity			
	Responds current state of the ecosystem and common drivers of degradation and loss		
	Periodic assessment of clear and measurable biodiversity conservation outcomes		
	Monitoring includes periodic assessments of unintended negative impacts on nature/ecosystems		
	Opportunities to enhance ecosystem integrity and connectivity are identified and incorporated		
#4 NBS are economically viable			
	Direct and indirect benefits and costs associated (who pays and who benefits) are identified and documented		
	Cost-effectiveness study is provided including the likely impact of any relevant regulations and subsidies		
	Effectiveness of design is justified against available alternative solutions, taking into account any associated externalities		
	Design considers a portfolio of resourcing options such as market-based, public sector, voluntary commitments and actions to support regulatory compliance		

ICUN Criteria:	IUCN Guidelines:	Y/N?	Notes:
#5 NBS are based on inclusive, transparent and empowering governance processes			
	Defined feedback and grievance resolution mechanisms are available to all stakeholders before intervention is initiated		
	Participation is based on respect and equality and upholds the rights of FPIC		
	Decision-making processes respond to the rights and interests of all participating and affected stakeholders		
	Mechanisms are established to enable joint decision making of the stakeholders in the affected jurisdictions		
#6 NBS equitably balance trade-offs between achievement of their primary goal(s) and the continued provision of multiple benefits			
	The costs and benefits of associated trade-offs are acknowledged and inform safeguards and any corrective actions		
	Rights, usage of and access to land and resources, along with the responsibilities of different stakeholders, are acknowledged and respected		
	Safeguards are periodically reviewed to ensure that mutually agreed trade-off limits are respected and do not destabilise the entire NBS		
#7 NBS are managed adaptively, based on evidence			
	Strategy is established and used as a basis for regular monitoring and evaluation of the intervention		
	Monitoring and evaluation plan is developed and implemented throughout the intervention lifecycle		
	Framework for iterative learning that enables adaptive management is applied throughout the intervention lifecycle		
#8 NBS are sustainable and mainstreamed within an appropriate jurisdictional context			
	Design, implementation, and lessons learnt are shared to trigger transformative change		
	Informs and enhances facilitating policy and regulation frameworks to support its uptake and mainstreaming		
	Contributes to national and global targets for human well-being, climate change, biodiversity and human rights, including UNDRIP (where relevant)		