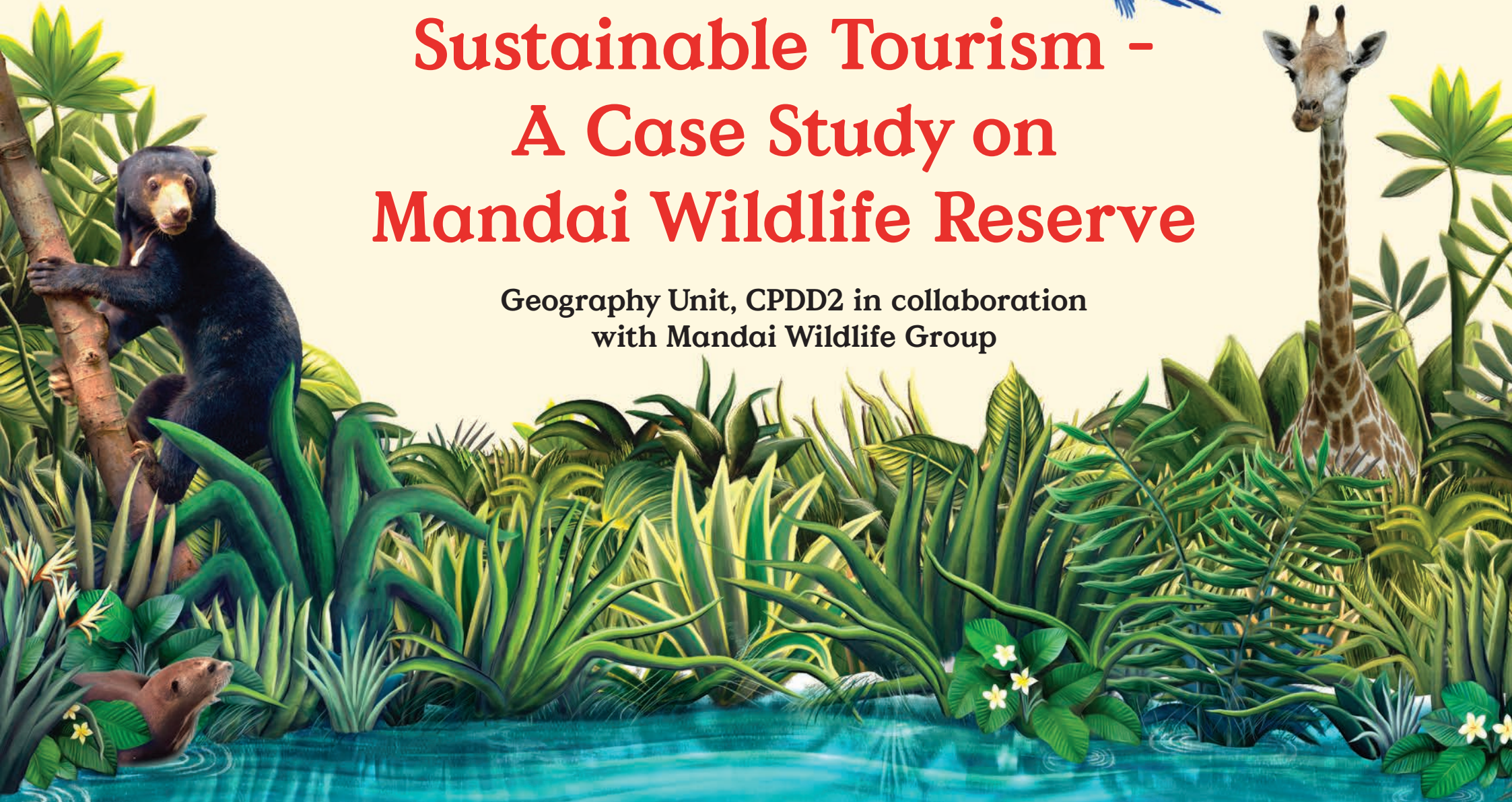


Sustainable Tourism - A Case Study on Mandai Wildlife Reserve

Geography Unit, CPDD2 in collaboration
with Mandai Wildlife Group





CONTENTS

CORPORATE OVERVIEW

Mandai Wildlife Group	03
The Triple Bottom Line Sustainability Framework	05

ECONOMIC SUSTAINABILITY

Ensuring Long-Term Financial Viability	06
Innovation and Transformation	08
Inspiring Guests Through Exceptional Wildlife Experiences	12

SOCIAL SUSTAINABILITY

Employment Opportunities	14
Promoting Diversity, Equity and Inclusion	15
Universal Design	17

ENVIRONMENTAL SUSTAINABILITY

Sustainable Operations	19
Biodiversity Protection	25
Sustainability Advocacy	32

Mandai

WILDLIFE GROUP

Mandai Wildlife Group (MWG) is an organisation that manages five (soon to be six) wildlife parks namely **Singapore Zoo, Night Safari, River Wonders, Bird Paradise** and **Rainforest Wild Adventure**; two indoor attractions namely **Curiosity Cove** and **Exploria**; **Mandai Rainforest Resort**, and community spaces such as **Mandai Boardwalk**.

Mandai

WILDLIFE GROUP

Our Wildlife Destination



Mandai

WILDLIFE RESERVE

Operating Parks



Indoor Attractions



As a purpose-led organisation, MWG is dedicated to caring for the planet and protecting wildlife. It strives to connect people with wildlife and champion sustainable living. It works with other zoos to conserve threatened species through dedicated breeding programmes. MWG also supports conservation projects in Singapore and Southeast Asia to protect over 50 threatened species and 450,000 hectares of critical landscape, in addition to engaging the local communities.



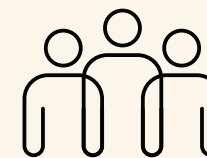
Certification of Sustainability
Certified by Vireo
www.vireosrl.it

MWG is a member of the Global Sustainable Tourism Council. The membership validates MWG's approach to sustainability best practices in the tourism industry.

The Triple Bottom Line Sustainability Framework



Economic Sustainability



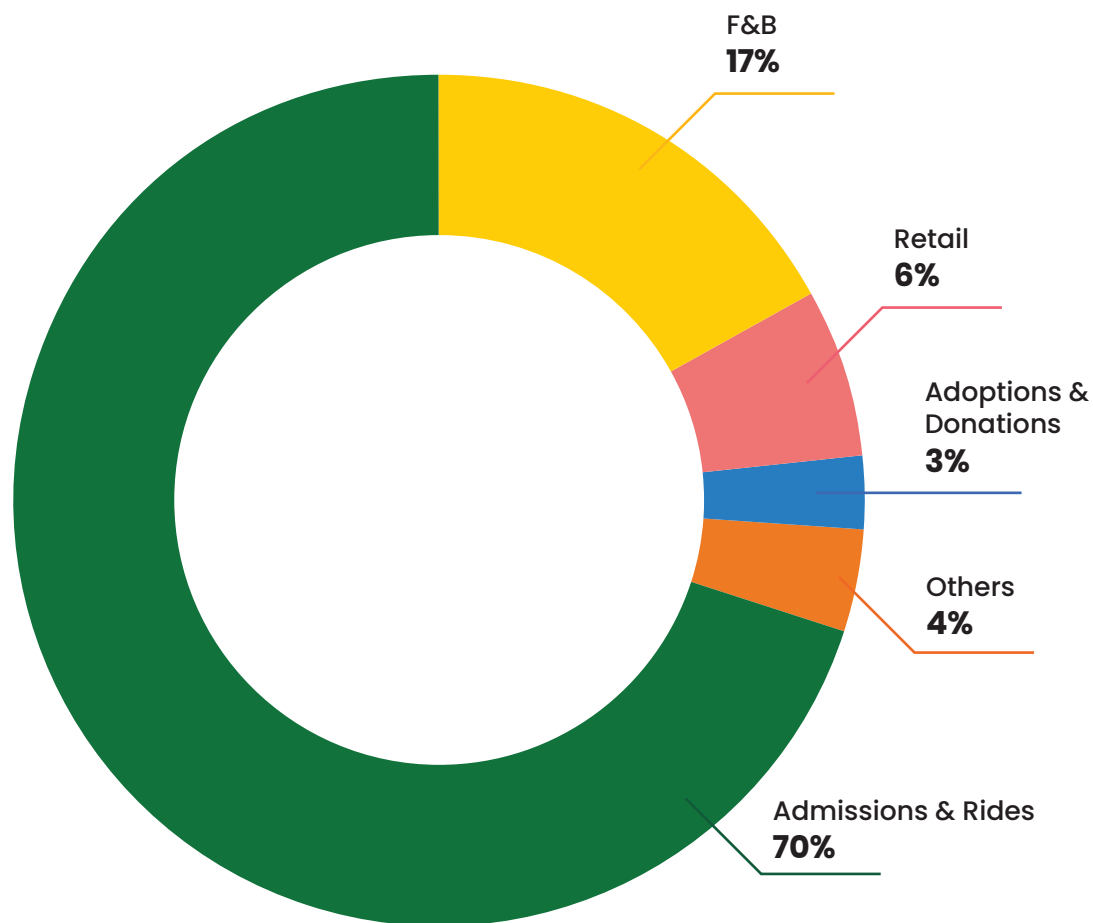
Social Sustainability



Environmental Sustainability

MWG embraces the 3P or Triple Bottom Line sustainability framework, focusing on Performance, People and Planet. The framework guides MWG in its strategic direction to achieve Economic, Social and Environmental Sustainability. By applying the economic, social and environmental dimensions, it contributes to sustainable tourism in Singapore. MWG is a member of the **Global Sustainable Tourism Council**, recognised for its efforts in sustainability.

Let's look at how Mandai Wildlife Group contributes to sustainable tourism.



Allocation of MWG's sources of revenue

Economic Sustainability

Ensuring Long-Term Financial Viability

In ensuring long-term financial viability, MWG adopts a holistic approach to expanding market segments, and growing and diversifying revenue streams. Through innovative marketing and sales strategies, partnerships with renowned brands for promotions and campaigns, key opinion leader engagements and social media presence, MWG attracts some five million guests each year, with 50% locals and 50% tourists. Apart from admissions, sponsorships and adoptions, F&B and retail activities contribute significantly to MWG's revenue. Bespoke wildlife experiences such as backstage tours, themed dining, customised lifestyle events, glamping, etc. are additional revenue streams.

Food for Thought!

To what extent does MWG's revenue sources demonstrate economic resilience in the long term?



MWG rallies corporates, non-profit organisations and individuals to help protect wildlife through various sponsorship and adoption opportunities.



From a cavern at Rainforest Wild ASIA to a lush forest setting against the backdrop of the tranquil Seletar Reservoir, couples are spoilt for venue choices to hold a unique wedding in the Mandai Wildlife Reserve.



Colugo Camp glamping experience is one of the accommodation options offered by MWG, in addition to resort stay at Mandai Rainforest Resort. Guests relax and recharge with Nature's healing hands while deepening their connection with wildlife.



Partnerships with strong brands such as Disney, Tokidoki and Snoopy in its marketing campaigns help MWG to tap into customer base and market segments which it may not be otherwise accessible.

Innovation And Transformation

To stay relevant and respond to the competitive tourism landscape and ever-changing customer expectations, MWG continually innovates to enhance guest journeys, from pre-visit, in-park to post-visit. Often, technology and digitisation are deployed to streamline operations. Exclusive wildlife experiences such as Backstage Passes and bespoke culinary journeys like Evening in the Wild create a sense of wonder that guests eagerly share on social media, helping MWG to gain awareness of its offerings.



Evening in the Wild – a bespoke culinary journey at Night Safari that includes a private dining experience in Singapore's only tipi tent, wildlife encounters and a chartered tram experience into the forest at night.



From penguins, manatees, scaly reptiles, elephants to invertebrates, **Backstage Pass Tours** take guests behind the scenes to enjoy close encounters with these animals and learn what it takes to care for them.



MWG's innovation journey culminates in the transformation of the Mandai Wildlife Reserve into an integrated nature-based destination where people can **Explore**, **Play**, **Immerse**, **Dine**, **Stay** and **Shop** while connecting to wildlife.

Food for Thought!

How effective are these offerings in catering to the spectrum of tourists' personality types? Why?



Explore

Each wildlife park and attraction at the Mandai Wildlife Reserve focuses on different biodiversity themes, offering endless opportunities for guests to discover and learn about the wonders of the natural world.



Pangolin Hideout

Play

Creating play opportunities is always at the top of the mind for MWG when developing new features or upgrading existing ones. As play is a powerful tool for learning and developing motor skills, the play features are carefully curated to highlight the elements of the natural world such as this Pangolin Hideout with play structures modelled after pangolins' burrows.





Immerse

Wild Apex at Rainforest Wild ASIA is amongst the immersive experiences offered by MWG. Others include Keeper for a Day and Hello From The Wild experiences in other MWG wildlife parks.

Dine

MWG-operated F&B outlets use sustainable cooking oil, serve sustainably sourced seafood, wildlife-friendly Owa Coffee and offer plant-based meal options. Apart from operating its F&B outlets, MWG also has a strong presence of tenants with renowned F&B brands to elevate guests' dining experiences.



Shop

MWG's retail outlets feature a wide variety of sustainable products to encourage guests to make sustainable consumer choices.



Stay

Mandai Rainforest Resort is one of the accommodation options available in the Mandai Wildlife Reserve. For its sustainable design, the resort bagged the first BCA Green Mark Award Platinum Super Low Energy for non-residential buildings.

Food for Thought!

At which stage of the tourism development cycle would you place MWG? Why?

Inspiring Guests Through Exceptional Wildlife Experiences

For MWG, delivering exceptional wildlife experiences is key to strengthening guest engagement, customer support, and brand equity. This not only ensures long-term financial viability but also connects guests with the natural world, inspiring them to protect wildlife and embrace sustainable living for a healthier planet.

Maintaining healthy animal populations is the cornerstone of delivering exceptional wildlife experiences. MWG provides the best possible care for its animals in the areas of nutrition, physical environment, health, appropriate behavioural interactions, and mental state (the Five Domain Model of Animal Welfare). Digitalisation, AI and cutting-edge veterinary technology are key drivers in enhancing animal care and employee productivity.

- 1 Physical Environment** – exhibits are designed to simulate the natural environment and encourage natural behaviours of the animals.
- 2 Nutrition** – providing animals with appropriate diets that mimic those in the wild.
- 3 Health** – MWG's veterinary team has in place a comprehensive healthcare regime for the animals, focusing greatly on preventive care – as the saying goes 'prevention is better than cure'.
- 4 Appropriate Behavioural Interactions** – The keepers design various enrichment activities for their charges to encourage natural behaviours, ensuring their physical and mental health.



Every member of staff in MWG (not just frontliners) is expected to serve from his/her HEART[®] and to inspire guests to connect with wildlife.



As a best practice in the delivery of guest experience, every MWG staff member is required to serve from his/her **HEART[®]**

Happy

Empathetic

Attentive

Reliable

Timely

Connect through **S**tores



Social Sustainability

Employment Opportunities

MWG is powered by 24 departments ranging from Animal Care, Veterinary Healthcare, Exhibit Design to Marketing, Guest Experience and Legal. It employs 1,500 staff to care for some 22,000 animals and deliver seamless guest experiences in its wildlife parks and other nature-based attractions, Mandai Rainforest Resort, campsites, and F&B and retail outlets.

Individuals from MINDS Woodlands Employment Development Centre had an enriching overnight camp experience at Singapore Zoo. Apart from offering free park admissions to beneficiaries from various social services agencies, MWG also curates programmes tailored to engage the underserved and guests with special needs.



Promoting Diversity, Equity And Inclusion

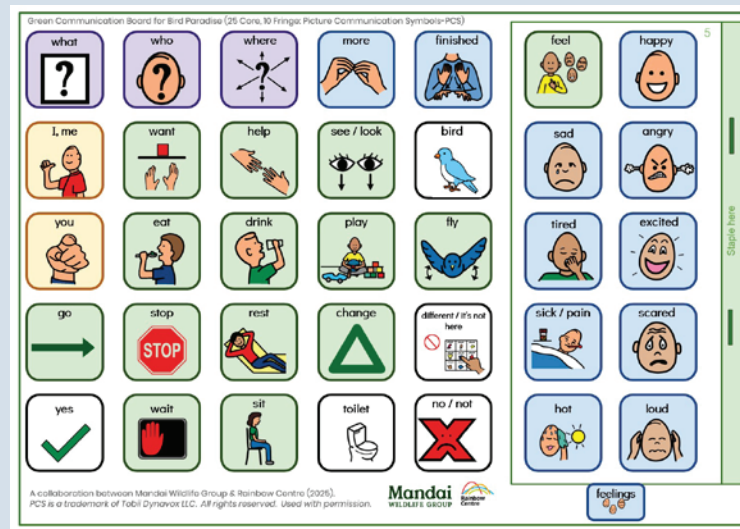
Guided by the policy of Diversity, Equity and Inclusion (DEI), MWG collaborates with APSN Delta Senior School (DSS), APSN Centre for Adults, and Project Dignity to support individuals with special needs through employment opportunities, internships, and work attachments. To nurture a well-trained workforce, MWG puts in place robust continual training programmes and professional development opportunities such as conferences and study trips.

MWG strives to make its wildlife parks and other attractions accessible to every segment of the community. Each year, it offers free park admissions to over 31,000 beneficiaries from various social services agencies, with Mandai Gives Back as a signature one-day event to host 800 beneficiaries including the elderly, disadvantaged families, and migrant workers.



Quiet Mornings@River Wonders organised in conjunction with World Autism Awareness Month. Apart from opening the park earlier, specially curated activities were offered, not only to engage neurodiverse children but also raise awareness about autism among park guests.

MWG welcomes guests of all abilities. In conjunction with Autism Awareness Month in April, it offers Quiet Mornings at River Wonders, opening an hour earlier on two weekends for neurodiverse guests to enjoy the tranquility of the park.



These Communication Boards were developed in collaboration with Rainbow Centre. They are designed to help people who are challenged with verbal communication to connect with others during their visit to Bird Paradise.

MWG works with Fei Yue Youth Services to engage vulnerable youths in career options. It also collaborates with educators from Special Education (SPED) Schools to curate programmes and resources for special needs children so that they can have meaningful learning journeys in the wildlife parks.



Ali Pesal, a past participant of the Fei Yue Career Exposure Workshop with Fei Yue Youth Services is now a full-time Junior Keeper at Singapore Zoo.

Universal Design

Universal design principles guide all the development in MWG's wildlife parks and its other features. Ramps, elevators, escalators, wide sheltered walkways to accommodate prams and wheelchairs, nursing rooms and adult changing stations allow for smooth, barrier-free guest experiences.

Bird Paradise is also equipped with hearing enhancement facilities at information counters, the Learning Centre and Sky Amphitheatre to facilitate an inclusive experience for the hearing impaired. For translating the understanding of diversity into their designs, Bird Paradise and Mandai Wildlife West bagged the BCA Universal Design Excellence Award.



The railing along elevated walkway is designed to be porous which allows children and visitors on wheelchair to view from a lower angle.



To enhance the experience for those with hearing impairments, the park provides hearing enhancement facilities at information counters, Learning Centres, and the 2,000-seat Sky Amphitheatre.





Environmental Sustainability

Committed To Net-Zero Greenhouse Emissions By 2050

Biodiversity is the variety and variability of all living things on earth. Our planet's biodiversity is at risk, with an estimated one million species threatened with extinction due to human activities such as habitat destruction and over exploitation. Human-induced climate change, leading to effects like accelerated global warming and rising sea levels, is worsening the situation.

MWG recognises that biodiversity loss is intricately linked to human-induced climate change and unsustainable practices. As an organisation dedicated to protecting nature and wildlife, it has committed to net-zero greenhouse emissions by 2050. To achieve the target, MWG is guided by an environmental sustainability strategy comprising three pillars: **Sustainable Operations, Biodiversity Protection** and **Sustainability Advocacy**.

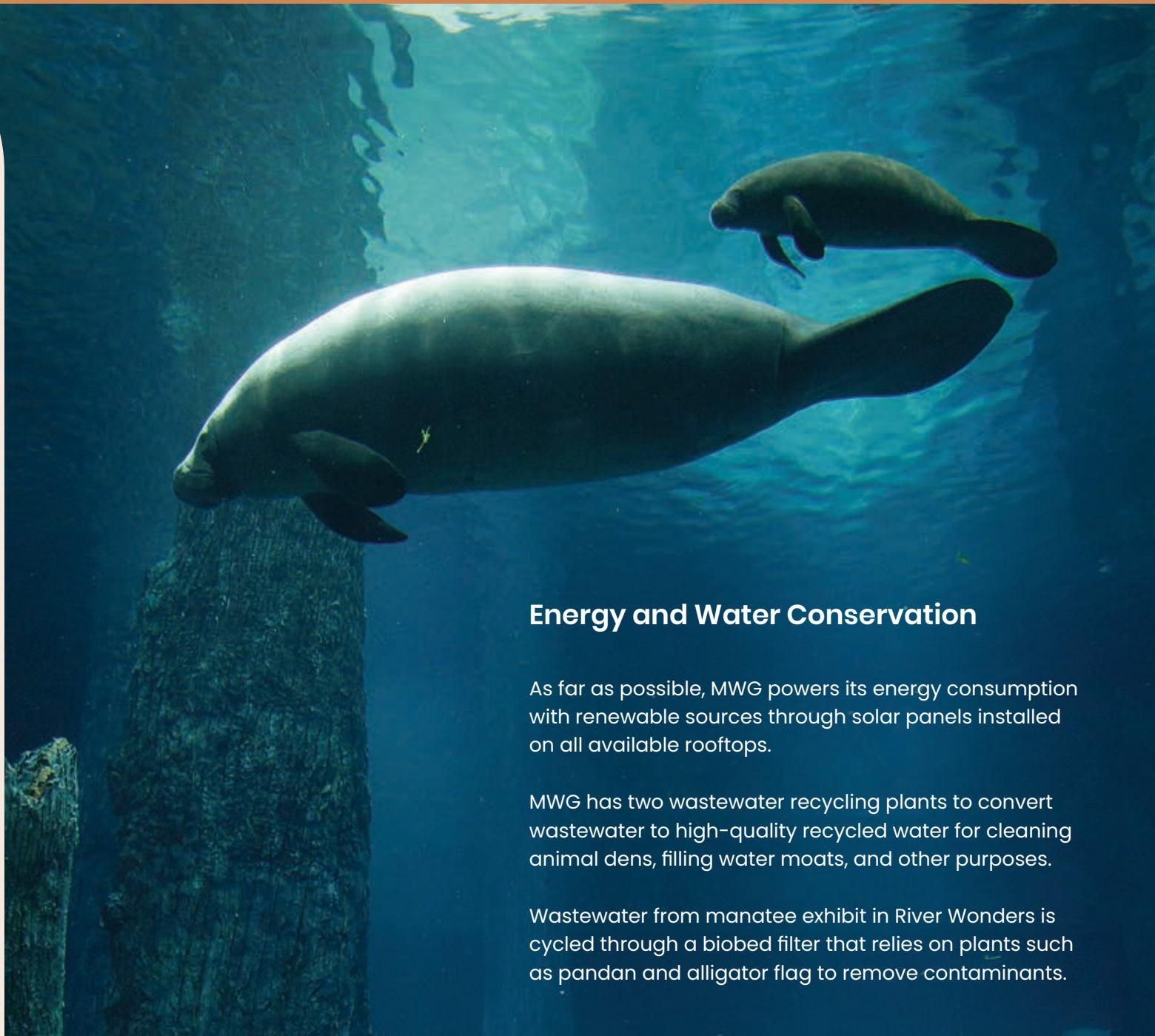
Sustainable Operations

MWG observes the mandate to operate its parks, attractions and other features in the best possible sustainable manner to reduce the impact on the environment. Its sustainable operations focus on these key areas:

- **Energy and Water Conservation**
- **Green Transport**
- **Towards Zero Waste**
- **Responsible Sourcing**
- **Sustainable Design**



River Wonders Manatee Exhibit makes use of a biobed filter system with specific plants to remove contaminants from the wastewater. The water can then be recycled, contributing to 50% of MWG's annual water savings.



Energy and Water Conservation

As far as possible, MWG powers its energy consumption with renewable sources through solar panels installed on all available rooftops.

MWG has two wastewater recycling plants to convert wastewater to high-quality recycled water for cleaning animal dens, filling water moats, and other purposes.

Wastewater from manatee exhibit in River Wonders is cycled through a biobed filter that relies on plants such as pandan and alligator flag to remove contaminants.



Green Transport

All trams, buggies, bus shuttles to Khatib MRT, as well as 40% of vans are electric vehicles (EV). MWG aims to convert its entire internal fleet to EVs or vehicles with low carbon fuel by 2030. A total of 20 EV charging stations are available at the car parks within the Mandai Wildlife Reserve.

Electric trams transport guests within our wildlife parks, reducing greenhouse gas emissions as part of our green transportation initiative.



Towards Zero Waste

Hissing cockroaches and black soldier flies are enlisted to compost raw food waste from the F&B kitchens. These detritivores feed, grow, and eventually become food for some of the animals in MWG's wildlife parks.



WATCH: *Fighting Food Waste with Hissing Cockroaches*

Each month, the animals in MWG's wildlife parks produce 60,000 kg of poo. A trial is being carried out to convert animal poo to fertilisers. If successful, this initiative will drive MWG's circular carbon economy, which is built around reusing resources repeatedly.



Herbivores such as elephants produce huge amounts of poo. Conversion of animal poo into fertiliser not only drives the circular carbon economy but also reduces the carbon footprint created from transportation for disposal.



Broccoli and celery stems

Instead of discarding unused vegetable parts such as broccoli and celery stems, the F&B and Wildlife Nutrition Centre teams work together to repurpose these vegetables as animal feed.

Single-use bottled drinks contribute significantly to plastic waste on our planet. MWG has removed all single-use bottled drinks and carrier bags from its operations.

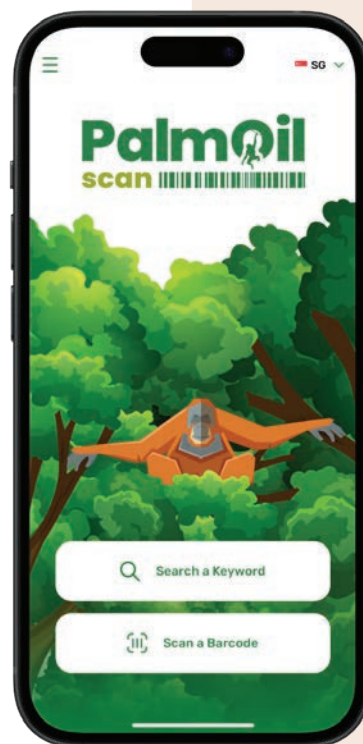


Responsible Sourcing

MWG uses its green procurement policy to guide staff in sustainable buying to ensure products such as tea, coffee, palm oil, paper, and seafood are responsibly sourced.

All palm oil used in the kitchens of MWG-operated F&B outlets is certified sustainable. This is to ensure that its operations do not contribute to unsustainable oil palm cultivation, which leads to rapid deforestation and severe habitat loss in Southeast Asia.

MWG supports local produce to reduce transport emissions. To reduce wastage, it also embraces the use of 'ugly food' as animal feed – perishables rejected by human consumers for cosmetic reasons even though they are just as nutritious.



PalmOil Scan App – Many products we use contain palm oil. This app enables consumers to make informed choices to shop for products by companies that commit to using sustainably sourced palm oil. Unsustainable oil palm cultivation is the main contributor to deforestation in Southeast Asia.

Food production is one of the biggest contributors to carbon emissions. Ugly food is unattractive to consumers but just as nutritious. Embracing ugly food consumption helps MWG to reduce its carbon footprint, taking it a step closer towards zero waste operations.





READ: *Sustainable design
at Penguin Cove exhibit*



Sustainable Design

All MWG's new developments and upgraded projects are designed to be carbon-efficient and nature-sensitive. To reduce energy and water use, it maximises natural lighting and ventilation in building design. Tree shade and innovative technology are used extensively to provide thermal comfort for guests.

For its holistic sustainable design, Penguin Cove in Bird Paradise attained a BCA Green Mark (Platinum) certification. The habitat features solar panels that power LED lights, a unique system for collecting rainwater to water the plants, and a chilling system that is 30% more energy efficient than conventional ones to keep the penguins cool and comfortable.



When planning new developments or upgrading existing exhibits and amenities, no efforts are spared to build around existing trees, retaining as many trees as possible. If retention is not possible, valuable trees are transplanted to suitable locations. Biodiversity surveys are conducted before construction begins, and appropriate measures such as relocation are taken to avoid impacting the wildlife in the affected areas.

Wild bamboo bats are found naturally in Singapore, including the wildlife parks of MWG. Before upgrading work was carried out in one of the exhibits, ecologists in MWG conducted biodiversity surveys and discovered bamboo bats living in bamboo clumps. Upgrading work only commenced after the bats were carefully translocated to a suitable habitat.



Biodiversity Protection

Protecting biodiversity is at the heart of MWG's reason for being. Adopting a studied and holistic approach to biodiversity protection, MWG focuses on these areas to:

- Breed threatened species
- Reintroduce specific endangered species back into the wild
- Provide medical care and rehabilitative support for rescued native wildlife
- Enhance habitats and connectivity for native wildlife
- Support conservation efforts in Singapore and Southeast Asia

Breed Threatened Species

MWG works with zoos around the world through dedicated programmes to 'matchmake' threatened species for breeding. Unrelated individual animals are paired according to genetic compatibility to ensure healthy offspring and that these species will not become extinct under human care.

In exchange for a male Malayan tiger sent to Taipei Zoo, MWG received a female tiger for breeding and injection of new bloodline to its Malayan tiger population.





MWG and other zoos around the world play a crucial role in ensuring the future survival of the critically endangered Rote snake-necked turtle, which has not been sighted in the wild since 2009.

With collective efforts, 46 Rote snake-necked turtles have been repatriated to their native home in Indonesia. They are cared for in a breeding facility while preparation work is being done to reintroduce them back to Rote island.

Reintroduce Specific Endangered Species Back Into The Wild

The Rote snake-necked turtle has not been sighted in the wild since 2009 and is presumed extinct in its natural habitat on Rote Island, Indonesia. It is threatened by habitat destruction, collection for the pet trade, and the introduction of predatory fish. Fortunately, this species is being cared for in wildlife organisations such as MWG. Working with zoos in the U.S. and Austria, and conservation partners, MWG has repatriated 46 turtles to a conservation facility in Indonesia. It is working with the facility to reintroduce snake-necked turtles into protected lakes on Rote Island.



Provide Medical Care And Rehabilitative Support For Rescued Native Wildlife

Apart from caring for the animals in its wildlife parks, MWG also provides medical attention for over 1,000 rescued native animals brought to its veterinary facilities from across Singapore each year. Some 60% of the rescued animals were released back into the wild after treatments and rehabilitative care. All releases were carried out in collaboration with NParks. By extending veterinary resources to rescued native wildlife, MWG contributes towards saving Singapore's biodiversity.



The Sunda pangolin is a native species of Singapore. Each year, 20 to 40 pangolins are injured in traffic accidents, rescued and brought to MWG's facility for treatment and rehabilitative support.



WATCH: *The Amazing Journey of Springle, the rescued pangolin*



Enhance Habitats And Connectivity For Native Wildlife

MWG's wildlife parks and its other attractions are located next to the Central Catchment Nature Reserve (CCNR). To safeguard the CCNR and ensure that its operations do not negatively impact the rich biodiversity, MWG sets aside buffer zones where no development is permitted. The Mandai Wildlife Bridge is a dedicated animal crossing to provide a safe passage for wildlife over Mandai Lake Road, connecting the buffer zones leading to the CCNR on both sides of the road. So far, over 80 native species including the critically endangered Sunda pangolin and the locally endangered lesser mousedeer have been documented to use the Bridge as a safe crossing.



Within MWG's wildlife parks, native trees are planted in a strategic manner to provide green corridors, food, and shelters for native animals that visit the parks.

Native animals such as the straw-headed bulbul, carpenter bee and Sunda colugo are often sighted in MWG's wildlife parks and surrounding areas. A staff of MWG is also conducting research on the critically endangered straw-headed bulbul to inform conservation actions to protect the species.



Supporting Conservation Projects In Singapore And Southeast Asia

MWG supports over 40 conservation projects in Singapore and Southeast Asia, protecting over 50 threatened species and 450,000 hectares of critical habitats.

MWG strives to support local and regional conservation projects that protect species, enhance habitats, and engage local communities.

Case Study – Owa Coffee And Gibbons

MWG supports the Coffee and Primate Conservation Project in their cultivation of wildlife-friendly Owa Coffee, which is shade-grown coffee. Instead of clearing forests for cultivation, Owa coffee is grown by farmers under forest shade. As forests are not cleared, this method of cultivation not only helps to conserve the forest homes of the endangered Javan gibbon and other wildlife but also provides a source of income for the villagers. In supporting the project and collaborating with the local community, MWG has succeeded in merging economics and conservation.

Cultivation of shade-grown coffee does not require forests to be cleared, thus protecting the forest home of the endangered Javan gibbons and other animals that live alongside them.



WATCH: *The Story of Owa Coffee*

Sustainability Advocacy

Every effort counts in protecting our planet and securing a sustainable future for generations to come. With over 1,500 staff members, and 5 million guests received per year, MWG is in a good place to rally for collective efforts for sustainable living.

Internal staff advocacy includes training and targeted campaigns to change behaviour. Engagement with guests involves dedication in embedding conservation and sustainable messages and call to action at guest touchpoints and in all marketing campaigns. For schools, various programmes such as Mandai Action for Wildlife are designed to inspire students to take ownership in championing wildlife protection and sustainable living.



Students who participate in Mandai Action for Wildlife get to hear from wildlife experts and interact with them to gain insights into conservation issues.



Participants of Mandai Action for Wildlife embrace self-directed learning to discover local conservation issues and curate an amazing variety of activities to engage the community and advocate for wildlife. While working on the projects, they learn communication skills, and the value of teamwork, empathy and resilience.

Conclusion

Food for Thought!

To what extent does MWG balance the economic, social and environmental dimensions to ensure sustainable tourism development?

What are the strengths of MWG's practices in influencing sustainable tourism development as a (business) stakeholder? What are the possible challenges it may face?

How do MWG's tourism practices illustrate the opportunities that Singapore can harness in navigating the impacts of tourism activity in Singapore?



This learning material is published in consultation with Geography Unit, CPDD2, Ministry of Education (MOE). We would like to thank MOE for supporting the development of this learning material.

Discover More About Learning Journeys At Mandai

Visit <https://www.mandai.com/en/singapore-zoo/learning-with-us/education-programmes.html> to find out more about the programmes and learning resources from MWG! Alternatively, contact them at eduadmin@mandai.com.

Photo credits Mandai Wildlife Group