ORANGUTAN HAVEN

» PROGRESS UPDATE 1st Quarter 2022 «

JANUARY TO MARCH, 2022

PanEco

YAYASAN EKOSISTEM LESTARI YEL

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1. Executive Summary

The Orangutan Haven is a unique conservation and education resource. We believe the Orangutan Haven is the first project of its kind in the world, as it promotes nature conservation and sustainable development in a unique and highly innovative fashion. This report describes the progress of the Orangutan Haven project to date.

Whilst initially focused on the orangutans themselves, what is today known as the «Orangutan Haven» has grown markedly in both size and scope. The lush wetland valley that contains the 9 orangutan islands is just one relatively small part of the entire 47 ha Orangutan Haven land area, most of which remains traditional mixed- agroforestry land.

A fantastic opportunity therefore exists to develop the whole site as a unique, comprehensive education resource for the entire region of northern Sumatra, promoting species and ecosystem conservation, animal welfare and sustainable development.

During the first quarter of 2022, we focused on further planning for future facilities and maintaining existing infrastructure. We have improved water supplies and biofiltration systems and intensified retention planting. We have also been engaged in construction/renovation work on associated infrastructure, such as roads and footpaths, and on essential facilities to welcome visitors and secure the land i.e., the front house, street lamps, restroom and border fences.

The orangutan islands themselves are to all intents and purposes ready to host the orangutans. However, as we intend to house a species protected under Indonesian law (i.e., the orangutans, but also some other protected species) AND we plan to charge entrance tickets to visitors, we are required to obtain *Lembaga Konservasi* (LK) status (the equivalent of a 'zoo licence'), before we can move the orangutan in from the nearby SOCP Quarantine and Rehabilitation Centre.

The application process for LK status is already underway and once we have it we will immediately add more ropes and climbing structures to one of the islands and move one of the orangutans in as soon as possible thereafter. There are 3 females and 5 males waiting to be transferred to the Haven and the plan is to mix the 3 females each with one of the males. Assuming this goes okay, there will be 5 transfers, 2 individuals and 3 'pairs, meaning that if we make one transfer each month it will take us around 5 months to get them all nicely settled in.

During this time period we also intend to start planning a 'soft launch' to the public. We are optimistic that both the transfer of the orangutans and the soft launch will all take place during the course of 2022.

As noted, the islands are pretty much completed and ready to receive the orangutans once we have the LK. Funding is still needed, however, for the island's water treatment systems (biofiltration systems); maintenance tools and equipment; public shelters; border fencing; the main Orangutan Haven car park and entrance area; the arrival area (including the ticketing booth, shop and public toilet); surfacing of roads; and cover of operational and administrative costs, especially as we hope to be selling tickets and receiving visitors before the end of 2022.

2. Background

As of March 2022, there are eight orangutans at the Sumatran Orangutan Conservation Programme (SOCP)'s Batu Mbelin Orangutan Quarantine Centre in North Sumatra that cannot be released into the wild due to health and physical reasons, caused by human impacts on their lives. Five of them are blind, due to being shot many times with air rifles. Dek Nong suffers from a chronic arthritic condition and two others have spent so long in captivity, one of them more than 19 years in a cage barely larger than his body, that we consider it would be unsafe for them to them to have to learn to live in a forest again. All eight, including five "big" males, must therefore spend the rest of their lives in captivity, which could potentially be as long as another 50 years or more. Currently they reside in large metal cages at the SOCP Quarantine Centre and whilst every effort is made to provide the best possible care for them, with as much behavioural enrichment as possible to keep them occupied, the inherent limitations of a caged existence mean that their quality of life is always going to be suboptimal if they remain where they are.

Adult male orangutan 'Leuser', will be one of the residents of the Orangutan Haven. He is blind due to being shot 62 times with an air rifle.

3. The Solution

The Orangutan Haven will provide each of these orangutans a much-improved quality of life and a far more positive and meaningful future in which they will help to communicate the plight of Critically Endangered Sumatran (*Pongo abelii*) and Tapanuli orangutans (*Pongo tapanuliensis*) to a wide and diverse audience. In giving these orangutans a life with all the support they need, in a far more spacious and naturalistic setting, they will serve as ambassadors for their wild counterparts and continue, via their educational role, to make a valuable contribution to the conservation of Sumatra's orangutans.

Adult female orangutan 'Dek Nong', who suffers from a chronic arthritic condition, will become an Island resident at the Haven

The solution offered by the Orangutan Haven involves the construction of a number of naturalistic islands surrounded by water moats. These islands are heavily vegetated and equipped with abundant climbing structures. Additional ropes, nets, raised platforms and hammocks (made from firehose) will be added when we start to move the orangutans in. In stark contrast to the cold metal bars of their present accommodation, the islands will give the orangutans a much more pleasant and enriching environment, with running water, grass to lie on, and timber and ropes on which to climb. At the same time, the animals will be housed and monitored in a manageable setting, in which all of their daily needs can be catered for by their keepers.

These 'model' islands will not only provide a sanctuary and improve the welfare of un-releasable apes, but also fulfil a vital role as a unique educational resource.

The new facility is being developed in an area within easy reach of Medan, Indonesia's 4th largest city (official population 2.5 million people, unofficial population likely nearer 3.5 to 4 million), where many of those who decide the fate of the orangutans' natural habitat, or influence such decisions, live and work. The Orangutan Haven also lies on a major tourist route to the town of Berastagi, the Karo Highlands and Lake Toba, which under normal conditions is travelled by many thousands of domestic and foreign tourists every month.

The Orangutan Haven will be open to the public so that both today's decision makers and those of tomorrow, will be able to visit, learn and understand: why orangutans end up in human hands, what are the consequences for orangutans and humans alike, and what is required to conserve the species and their habitat in the present day? This highly innovative 'model' project will offer a long-term, viable solution for the few unfortunate orangutans at the SOCP that cannot be returned to the wild, and serve as an example that could be easily replicated in other regions, where there are orangutans or other critically endangered species in similar situations.

The Orangutan Haven also has unlimited education potential too. Through a unique experience, both local and international visitors will gain a better understanding of orangutans, their individuality, intelligence, and complexity, and develop far greater appreciation of the threats they are facing in the wild, and the need for human populations to co-exist with and to conserve them. As a result of this inspirational experience, it is our hope that visitors to the site will feel encouraged and empowered to help protect the remaining wild orangutans and their habitats in Sumatra.

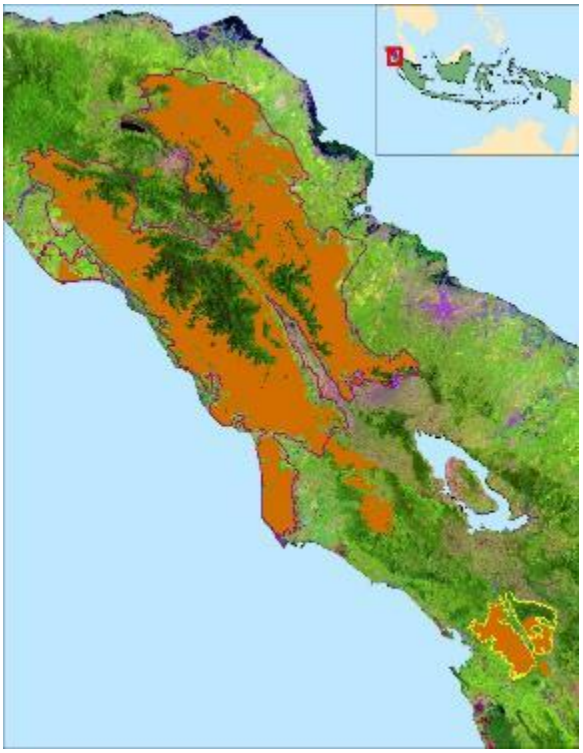
We are confident that in spite of the present extraordinary situation, the first ape will begin moving to the islands in 2022 and that the Orangutan Haven will be ready for a soft launch to the public in the same year.

Drone ortho photo taken in July 2019 depicting the location of the SOCP Orangutan Haven (bounded in red) in North Sumatra, Indonesia. The valley and islands can be clearly seen stretching north to south in the centre of the image, surrounded by the Haven's 47 ha of mixed agroforest landscape

4. Primary Objectives

1. Provide greatly improved living conditions for disabled or otherwise un-releasable orangutans in need of lifelong support;

2. Foster greater support for orangutan and tropical rainforest conservation, through offering professional environmental education and awareness programmes at the Haven.



Map of wild Sumatran and Tapanuli orangutan populations

In the context of the two primary objectives above, the Orangutan Haven will educate and inform visitors of all backgrounds, from school children to international tourists regarding:

- Wildlife conservation;
- The importance of wild habitats, such as the Leuser and Batang Toru Ecosystems, for human welfare and livelihoods;
- Issues surrounding the illegal wildlife trade in the region;
- Sustainable agriculture, architecture, energy and socio-economic development.

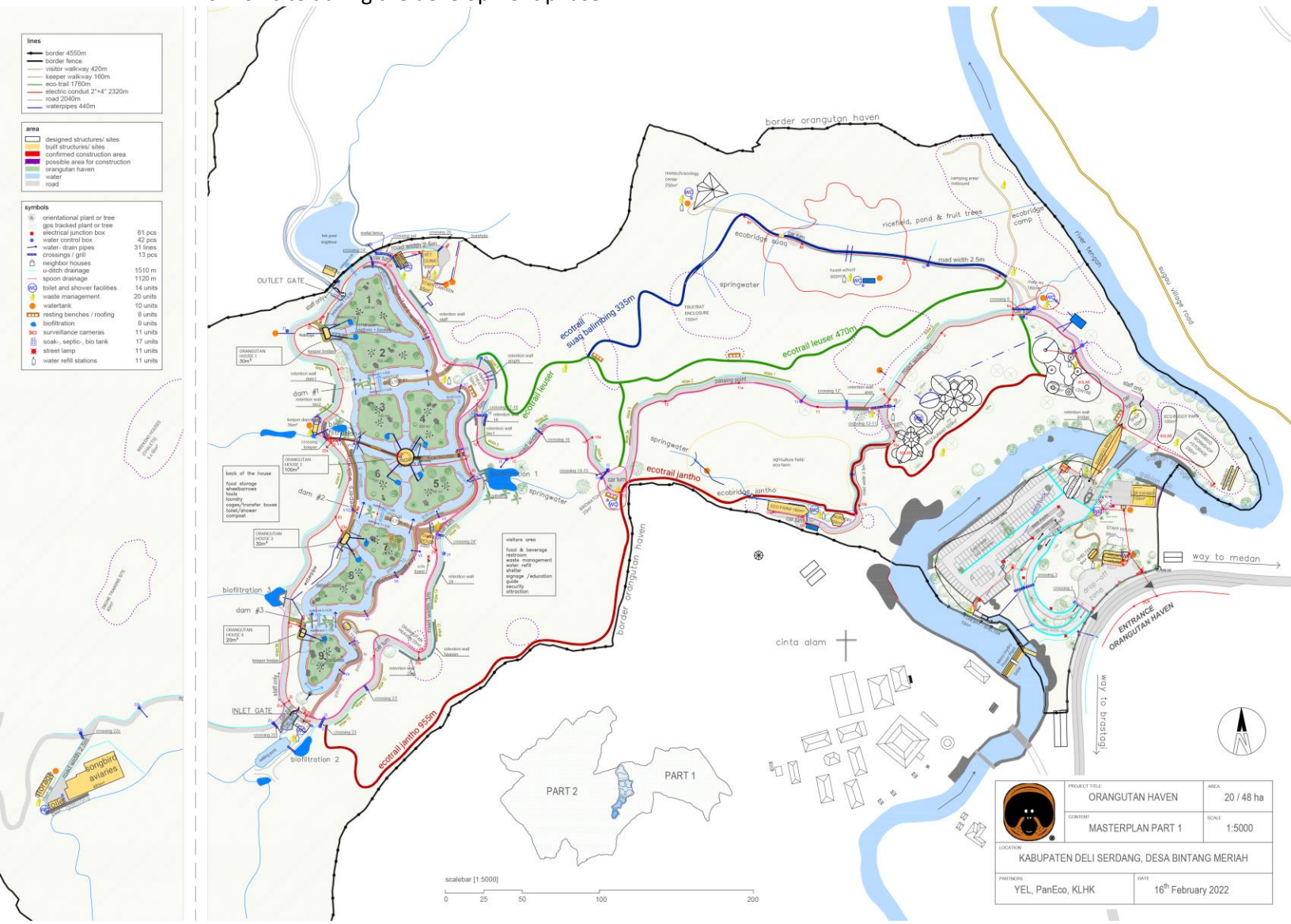
This will be achieved via the 6 main focus areas of the Orangutan Haven, laid out below.

The six primary focus areas of the Orangutan Haven

5. Masterplan

The Orangutan Haven Masterplan provides a strategic overview of the entire site. The document continues to be developed with inputs from people (both internal and external) with considerable expertise in various different fields, many of them offering their assistance voluntarily, or '*pro bono*', due to their keen interest and support for such an innovative and exciting project.

For the purposes of the Masterplan we use geodetic systems and GPS data to carefully determine the position and orientation of the buildings, roads, trails and other facilities within the landscape. The representative Masterplan is shown to guests before and after visiting the site, help them to get their bearings and understand what they have and have not seen during their tour. In this way they are far better able to imagine what the Orangutan Haven will look like when complete, and to appreciate its ground breaking nature and scale. The technical Masterplan is more often used, however, as an important planning tool for the Haven's development team, and as an orientation tool for the labour force when discussing their daily work on site during the development phase.



Technical Masterplan depicting planned objects by February 2022. The Masterplan is continuously updated and increasingly detailed. To date it focuses on only one portion of the entire Haven site (namely the easternmost 1/3 of the total area where most of the currently planned facilities (phase 1) are located.

6. Security Border Fence

A 2.6 km border fence was built in 2015 to demarcate the Orangutan Haven land and separate it from its neighbours. The initial 'barrier' consists of spiny snake fruit palms and barbed wire, in separated sections. In 2018 - 2020 we added spiny bamboo plants which will both demarcate the border and can later be harvested and used as a construction material. We have also planted areca trees (commonly known as betel nut), along the edges of the land as this is the most common and most recognized border vegetation in the region. Periodically we plant additional trees, and add barbed wire and permanent border posts where required, especially in some of the more remote stretches of the Haven boundary.

Border fence posts along the southern land that borders with Cinta Alam

At the bottom of the orangutan islands valley we have cast a permanent 'rubble stone' foundation for the boundary fence that retains the land and prevents erosion into the neighbour's pond. On top of this we have erected a light metal fence carefully designed to blend well into the surroundings whilst remaining difficult to climb/cross. Creeping plants like wild passion fruit and clitoria plants were added and are beginning to further blend the fence into the surrounding natural vegetation. The same design has also been used to build a visually unintrusive boundary fence at the entrance to the Orangutan Haven and this has been augmented with street lighting as well to maximise security and control of people coming in and out.

On the southern and northern borders of the Orangutan Haven, we plan to install a permanent fence eventually, consisting of concrete poles, each 2 meters tall, and barbed wire. This fence will help us prevent theft of some of the agricultural produce on site.

7. Orangutan Islands

The SOCP currently has eight orangutans that cannot be released to the wild and must be housed at the Orangutan Haven; 5 large adult males and 3 females. We plan to pair each female with one of the males for companionship. Therefore, we only need 5 islands to accommodate them, meaning that we have flexibility to accommodate several more un-releasable orangutans in the future if we need to.

Due to the nature of the design of the islands and associated orangutan houses, we are, however, able to give orangutans access to more than one island. This can be done at the same time, by allowing them to enter the orangutan house, move to another cage and then access out of the building onto a different island, or by simply hanging ropes between islands so that the orangutans can climb across. It can also be done on a monthly rotational basis as we can 'switch' orangutans across inside the houses so that they can 'swap' islands, without them having physical contact during the process (important as adult males will attack each other).

The valleys 9 orangutan islands are separated from each other and the visiting public by moats, a minimum of 1.5 meters deep at their deepest point and a minimum of 5 meters wide. The islands and moats have all been created using excavators and local labour. Water levels are regulated by five dams spread along the valley, with inlet/outlet pipes and gates for controlling through-flow. The three dams that separate the islands from one another correspond to four water levels along the valley and were built with a natural overflow system (large waterfalls) to regulate water levels and maximise oxygen absorption. A water catchment basin and settling pond at the inlet gate near island 9 helps to regulate storm water and sedimentation, and will allow us to manage the water level during dry seasons.

The four water levels were filled step by step starting from the top, assuring sedimentation and water flow can be dealt with at each level. The three dams were constructed from gabions (wire mesh filled with river stones), covered with soil, sugar palm mesh and a bentonite clay mixture. The waterfalls are lined with natural stone that creates a ripple effect and enhances oxygen absorption.

Aerial images of the Orangutan Islands Valley during its development; from top to bottom in 2015, 2019, 2022

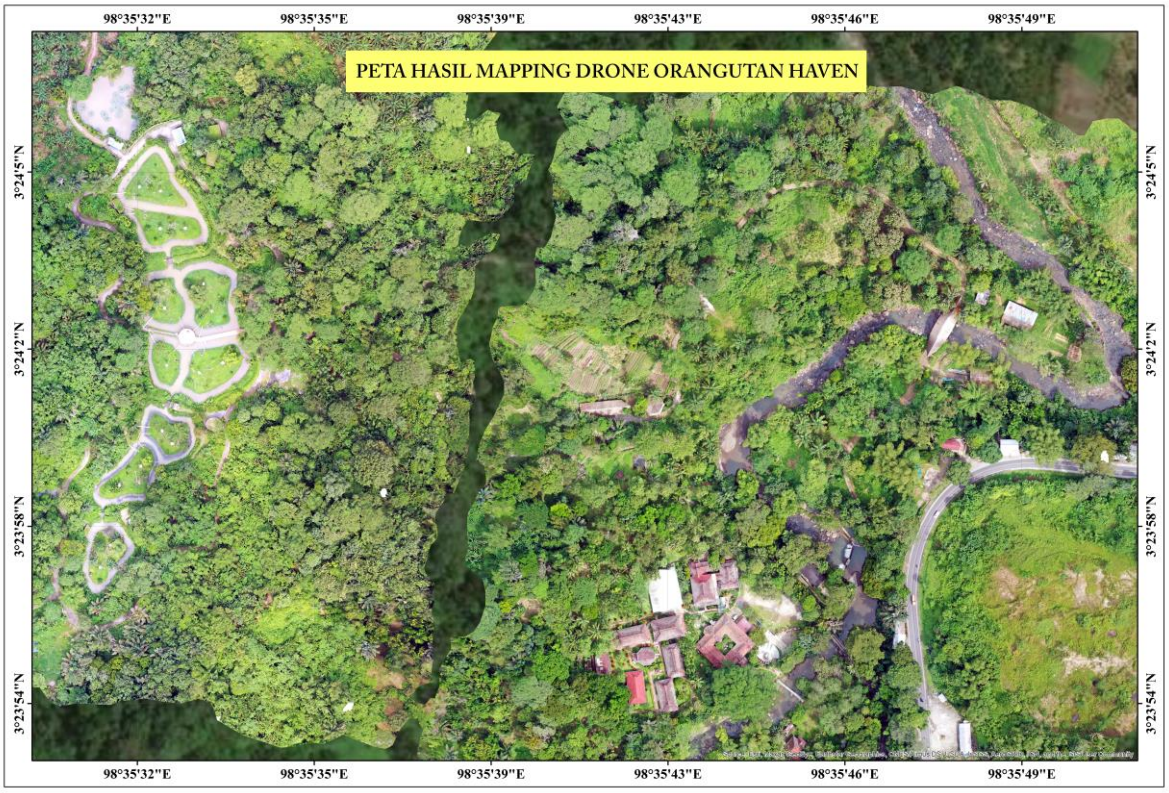
Our team is also building the climbing structures for the orangutans. Each island has two permanent metal poles from which large timber logs (former electricity pylons), coconut palm logs and thick bamboo poles can be hauled up and fixed in place. This all provides a framework to which ropes, nets, hammocks and other structures will be added nearer to the time when we are ready to move the orangutans in, to prevent them being degraded unnecessarily by the weather.

Each metal pole also supports a platform for rain and sun protection with a nesting basket underneath that simulates the orangutans 'treetop nests'. Trees and other vegetation planted on the islands is now providing considerable shade and will be a natural form of behavioural enrichment for the orangutans when they move in.

Water springs provide 24-hour access to clean fresh drinking water on each island. Furthermore, we are also filtering the natural spring water that flows into the moats through placement of a natural bio-filtration system. Water first flows through rocks interlaced with a natural mesh of fibres and filtering plants, cleaning out impurities and ensuring fresh, clean water surrounds all of the islands, safe for the orangutans to drink should they wish to. These units will be equipped with educational signage so that visitors and school groups can learn about the importance of clean water and the importance of natural ecosystems for filtration.

Island design plan (L); the state of Orangutan Island construction as of January 2022 (R)

The project benefits from its natural surroundings, which forms a water basin. Hydrological studies of the valley monitoring all water inputs (streams, rainfall, overland flow) and outputs (stream, evaporation etc.) prior to construction of the islands suggested that no major waterproofing of the moats (e.g. via use of a geomembrane or concrete slabs, etc), would be necessary.
We successfully used bentonite and rubble stone in several key locations for waterproofing of the dams, however, while leaving the remainder of the moats simply as compacted earth. Today we are collecting data and monitor sediment build up both upstream of and along the island valley.



Drone mapping of the Orangutan Haven in November 2021, depicting the islands on the left

As an additional safety measure for the orangutans, three strands of electric fencing are located just above the water level around each island, at a distance of about 1 meter from the islands perimeter. This will act as a 'psychological barrier' to the orangutans, keeping them on dry land and discouraging them from entering the deep water section of the moat.

We continue with maintaining moat clearance (removing vegetation along the moat edges) and more intensive retention planting along the visitor walkways at the eastern side of the valley, creating natural vegetation 'barriers' in areas where we wish to restrict visitor access.

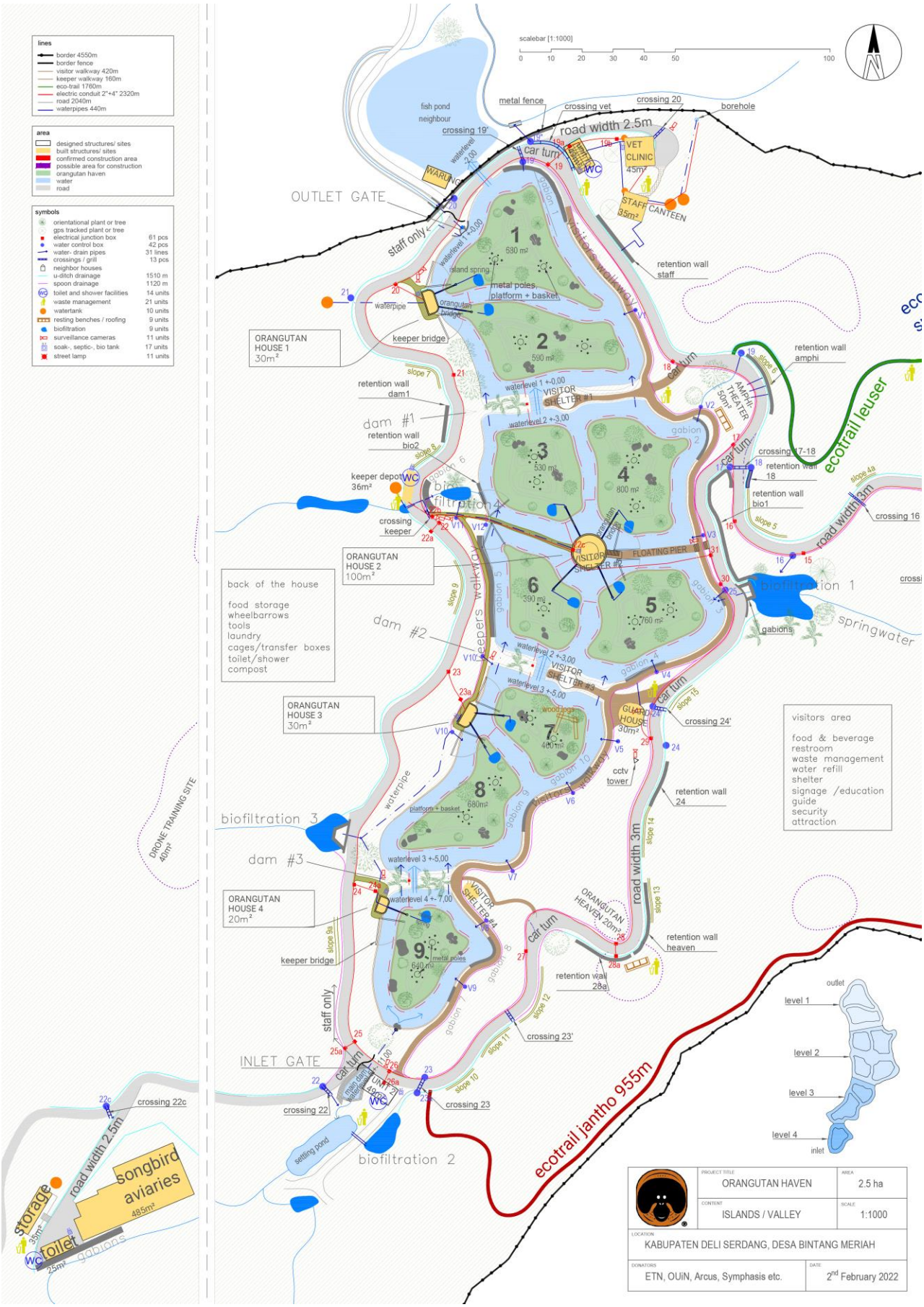
The first 'visitor shelter' in the islands valley was built 2021 at dam #3, with look-out possibility to island #9 and #8. This is near to the islands new security post, the Guardhouse, which is now the hub for the installed camera surveillance system, comprising 11 cameras scattered in strategic locations around the islands valley to maximise safety and security.

Looking south at water level 1 with the veterinary complex and public toilet to the left, orangutan house #1 on the right and orangutan house #2 in the background

Looking south towards waterlevel 2 with orangutan house #2 in the middle

Looking south towards water level 3 with the guardhouse to the left and orangutan house #3 to the right

Looking south towards water level 4 with the new visitor shelter to the left and orangutan house #4 on the right



Orangutan Islands Masterplan as of February 2022

8. Orangutan Houses

Four ‘orangutan houses’ have been created in the islands valley linking each of the islands with safe indoor holding area for the orangutans, allowing them to get out of heavy rain and providing a secure safe area where they can be kept overnight if needed, e.g., if heavy storms are forecast. The layout of the cages inside each house allows animals to be moved from one island to another safely and easily, without the need for anaesthesia.

The orangutans will access the houses from the islands via a sturdy bamboo bridge across the water moat. Even if left to spend the night on the islands each orangutan will be encouraged to enter the associated house for at least half an hour every morning and evening allowing them to be closely checked and monitored on a daily basis, and for any medications to be administered if necessary. To allow staff to access the islands on a weekly basis for cleaning and maintenance (whilst the orangutans are in the houses), lightweight keeper bridges have been constructed that can be easily swung out over the moat from the keeper side, and pulled back again after use.

View from the visitor walkway towards orangutan house#2

Orangutan house 2 is an exception to the other 3 smaller houses. It is the biggest house, with cages linking to four islands instead of just one or two It also links to the public side of the islands valley via a floating visitor walkway

Staff can enter the building from both the public side and the keeper side of house 2, and visitors will be able to access the roof of the building via the floating walkway and the stairs. There they will find an astonishing view of the islands and the orangutans, sometimes with the animals at eye level, and shelter from the sun and rain, under a small lightweight bamboo pavilion, allowing visitors to take a short break during their tour of the orangutan islands.

The houses are carefully designed to minimize the risk of orangutans escaping. Apart from the shape and materials used which mean the orangutans should not be able to climb out, some electric fencing has also been placed on the front facade. As with the fences at the edge of the islands themselves this is more of a 'psychological barrier', as it should be out of reach for even the largest of the orangutans, and is intended to dissuade them from even attempting to climb out.

All of the orangutan houses will be equipped inside with ropes, nets and hammocks once we know we are able to move the orangutans in. Numerous metal rings were fitted to the inside walls in March to allow the equipment to be fitted. The ropes and nets and material for the hammocks (old firehose generously donated by the Singapore fire department) are all on site and ready to be installed.

9. Keeper Depot

At the back of the islands (non-public access) there is a 'keeper depot' where the daily food rations will be cleaned and prepared for the orangutans. It contains a kitchen area, storage racks and a shower and toilet for the staff. Only some furnishings and a composting system (for food waste) remain to be added. We began educating the islands staff about composting and now make our own fertilizer too, for the time being, use it on plants around the orangutan islands.
All water for the keeper depot is taken from a nearby spring that has enough capacity for both this facility and orangutan house #2. At a later stage, a filtration system will be installed to make the water drinkable.

10. Veterinary Complex

The veterinary complex, which includes the medical clinic and adjacent staff canteen, is situated near the island complex at the northern end of the islands valley and occupies about 150 square meters in total. This area will be closed off to the public to ensure that animals with medical needs will have a safe, quiet place and that staff can complete their activities without disturbance. The two buildings are a hybrid of bamboo and brick construction with a grass roof and natural open ventilation all around.

While the veterinary clinic will serve for health monitoring, medical check-ups and emergency cases for orangutan, it will also have cage facilities to care for, treat and quarantine birds as part of the songbird captive breeding programme we are planning. It will probably also serve as a first-aid station for staff and visitors too. It will house a basic pharmacy, first aid kit, lab for routine examination of blood and faeces, a work bench with sinks next to a surgical table, and simple facilities for a veterinarian to sleep over if they need to.

The staff canteen is situated on the hillside, slightly up from the medical clinic. It overlooks almost the entire islands valley, providing a perfect vantage point for surveying the islands and monitoring what is going on, even during coffee and lunch breaks! This facility is also now fully equipped and fully functional, and has already hosted several important guests during their tours of the site.

The access road up to the Veterinary Complex is laid with pavement blocks and has been landscaped, using shrubs that naturally repel mosquitos, and some plants that are edible and can be used in the canteen kitchen.

The staff canteen often also welcomes visitors; here our neighbours from the convent 'Cinta Alam'.

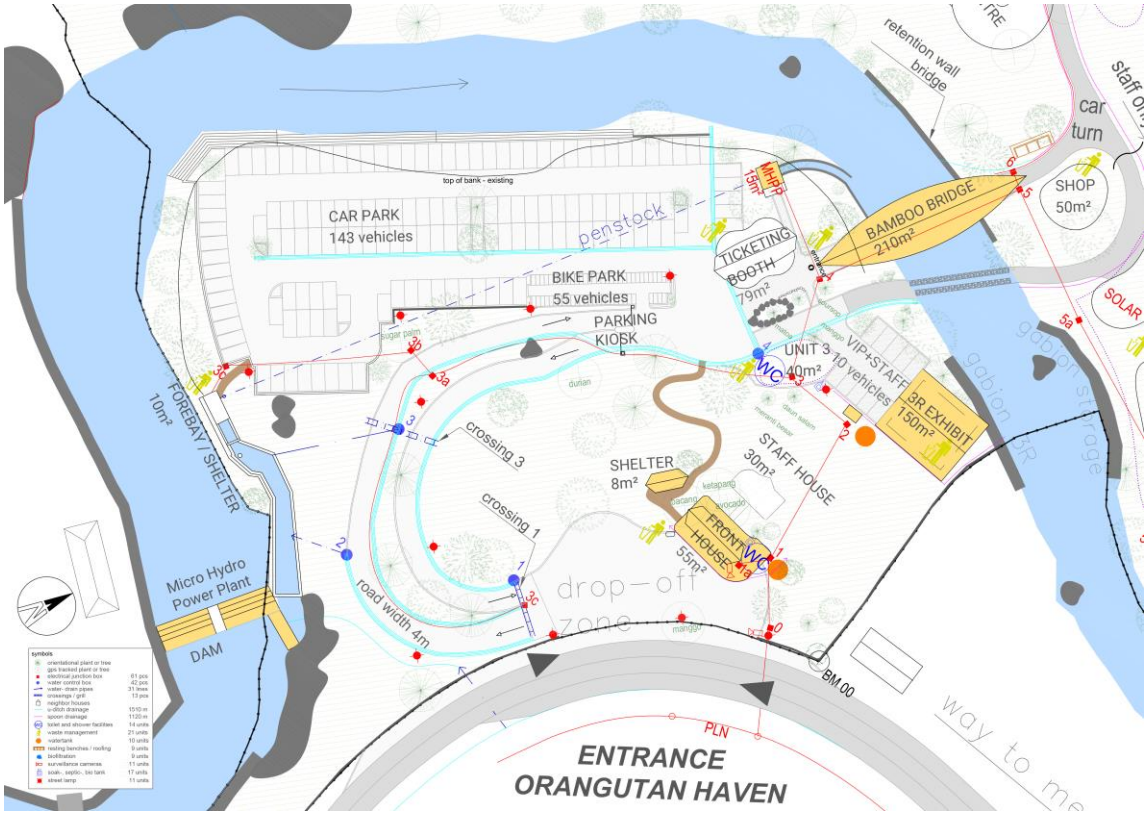
11. Guardhouse

The Guardhouse is located in the orangutan islands valley on dam number 2. Its location was carefully chosen to accommodate a monitoring hub for all surveillance cameras and the base for two security guards tasked with ensuring the safety and security of the orangutans. The idea is to have one guard constantly patrolling the islands and one guard watching (e.g. monitoring CCTV) from inside the monitoring hub. A sleeping and changing room next to the monitoring room allows shifts and gives us the flexibility to increase the number of guards.

Not only is the guardhouse perfectly allocated for security purposes, it also serves as a good vantage point for visitors, who can shelter during rain under its extended roof, with benches to sit on.

12. Front Area

Located at the Front Area of the Orangutan Haven, coming in from the main road, are the Front House, the Staff House, the Car and Bike Park with adjacent shelters, the Ticketing Booth, Toilet Unit #3, the Micro Hydro Power Plant and the Reduce/Reuse/Recycle Exhibit. This area and all its facilities is our priority for development in 2022 and work is well underway, with technical drawings now being finalised and construction due to commence during the next quarter.



Front area layout depicting car park and entrance situation as of February 2022

a. Front House & Staff Facility

The Orangutan Haven's 'Front House' was built many years back, and was in fact the very first construction on site when the land was first purchased. It has served as a basic arrival zone with a small office and toilet facilities for staff, and a secure storage area. Recently, as we are now planning the development of the whole front area of the Haven more seriously we renovated and upgraded this facility, and expanded its roof coverage so it can also shelter visitors and even some vehicles from heavy rain.

Behind the Front House will be a new Staff House that will provide accommodation for staff and consultants from outside the local area, and which will also provide some office space for the Orangutan Haven's operations. Looking down on the main arrival area (parking, ticketing, bridge etc.) it is a perfect vantage point for staff to have as a base.

The newly renovated Front House with traditional local pitched roof and ornamentation in line with the local Karonese culture.

View of the rear of the Front House, overlooking the Haven's iconic bamboo bridge

The Front House car and motorbike parking area with secluded restroom at the back

There is no funding yet available for the planned Staff House building and so to date we have only been able to proceed with renovation of the Front House, which is now fully operational.

b. Car Park & Entrance

With special attention to traffic flow and national regulations we are currently communicating and collaborating with the national department of transportation and the international engineering company 'Arup' to ensure arriving visitors will have a safe and smooth entry into the Orangutan Haven site, and well managed parking and ticketing facilities.

A separate exit road to mak the incoming and outgoing traffic smoother has to be excavated soon followed by further shaping and installation of drainage channels. When this is done we will use the excavator to also shape and retain the parking lot, which is a major step needed before the Orangutan Haven's planned soft opening, which we hope can be realised in 2022. Here cars and motorbikes will find spacious parking with all necessary security and operational facilities.

The technical drawings and cost calculations for the car park area have already been completed and we hope to have funds available to at least start earth works and base course construction during the 2nd quarter of 2022.
Due to limited flat space for the parking area we plan to develop a solution for coach parking with the adjacent communities and a drop off area there, possibly making use of a pedestrian bridge to the Haven entrance area.

c. Arrival Area & Ticketing Booth

An ‘arrival area’ concept has now been developed and approved. It was reviewed by Stuart Green, of of Green & Dale Associates, Landscape Architects, Environmental Planning and Zoological Design who has assisted the Haven team since 2013, producing the early ‘artist’s impression’ sketches.

Currently designed for a maximum of around 780 visitors per day (public holidays), based on the projected Haven business plan, this area is not only supposed to welcome and guide visitors into the Orangutan Haven but will also function as an information hub and shelter for queuing visitors. Three main facilities are planned for this: a) a ticketing booth to provide information to visitors and sell/check tickets, to be located in front of the bridge; b) a shop with merchandising products and a food/drinks outlet, located after the bridge and c) a visitor restroom, set off to the side in front of the bridge.

Our own in-house architect, Jhon Saragih, has designed the ticketing facility and carried it into the technical drawings phase. A set of complete working drawings is now available and we began staking out the construction site during the last few weeks. This building will foster new methods of sustainable construction and for that we plan to work together with our old friend bamboo expert Jörg Stamm, on bamboo techniques on structures, and with Earth Construction Bali for ‘rammed earth’ walls and floor. We predict this facility will be completed and ready to be operational before the end of 2022.

Jhon Saragih during the model making process

13. Access Roads

Base course construction of the 1,800m arterial access road from the front to the islands valley and around it was completed in 2017. We also added 115 meters more to create access to the Eco-Farm, 28 meters access road to the Veterinary Complex and 308 meters access road to the new Songbird captive breeding aviaries. All roads now have their base course and necessary drainage systems and gullies in place, but still await final surfacing with paving blocks (except the 28m to the Veterinary Complex which is already fully paved). Until then the maintenance of the temporary 'base course' surface is a constant task due to erosion. Only the 132m access road to the planned Forest School Education Centre has not yet been excavated and is pending until sufficient funds are available.

Along the roads pipes and control points have been laid down for future electrical infrastructure and at several locations we have used slope saver mesh (made from coconut fibre) to prevent erosion and planted retaining vegetation (e.g. Vetiver grass - *Vetiveria zizanioides*, a densely tufted grass with stout roots), to further stabilise the soils. In some areas with poor soil conditions and steep gradients, retention walls were built with rubble stone from the river. Up to this day we continue retaining and planting accordingly on all slopes.

Current road condition without the final layer of paving blocks

There are crossings in some places along roads to break the stream of water at the bottom of steep slopes during heavy rains. Some of these crossings were made with precast U-ditch elements and have a galvanized metal grill on top, others simply make use of precast kerb stones.

We hope to be able to secure funding to begin the final surfacing of the roads with paving blocks in 2022. The sooner this is done the maintenance costs for the roads will come down, due to erosion of the existing base course materials and the need to maintain them, and of course smoother roads will optimise visitor comfort and enjoyment.

14. Maintenance Centre

To maintain all of the facilities and infrastructure at the Orangutan Haven we are in need of a centralized maintenance facility, with a workshop and storage space for materials and equipment. The best location will be determined by the planning team soon and the goal is to have a working concept brief and designs by the end of the year.

Our maintenance and technical team was recently strengthened with the arrival of Yon Maryono. A routine maintenance schedule has also now been developed and one of our long-term local staff is being trained to become a coordinator for this task.

Newcomer Yon Maryono servicing one of the generators used for remote construction work

15. "Rimba Raya" Rainforest Centre

This spectacular bamboo building, covering more than 1.000m², will be the first major facility visitors encounter after crossing the bridge and entering the Orangutan Haven site, and serve as a major visitor hub. It will provide various visitor services and house seminar and conference facilities. It will also host an innovative and interactive multimedia exhibition, presenting Sumatra's incredible biodiversity, tropical rainforest ecosystems and the many pressures that they face.

Swiss architect Lukas Zollinger has been commissioned to complete detailed construction plans for the Rainforest Centre under the guidance of Colombia based master carpenter and bamboo expert Jörg Stamm. Scenographer, Stefanie Frey, is developing the concept and design of the exhibition, working alongside a highly-skilled team, including graphic designer, Eve Hübscher, and public artist, Ernest Goh. These international experts are working side-by-side with the local Orangutan Haven team, enabling cross-cultural learning and knowledge transfer.

The present focus of development of the Rainforest Centre lies on the exhibition concept itself, so that space and infrastructure needs can be defined. Following this critical step, designs can be finalised and construction plans developed over the course of 2022. Once again, when these are available, fundraising will be the next big challenge prior to actual construction of the facility.

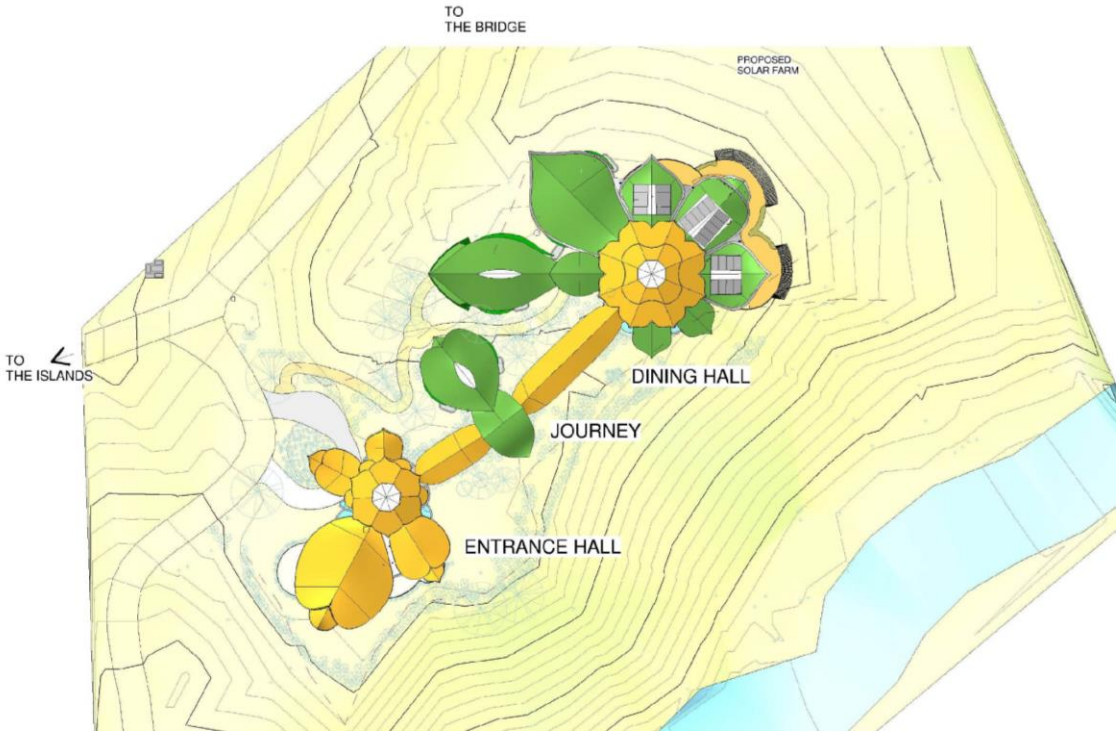
16. Restaurant

The Orangutan Haven is in need of a hospitality infrastructure for visitors (food, beverages and functions), which will serve as another major hub for the Haven and a profit centre, to raise sustainable funding for the operations of other parts of the site (including education programmes) and the wider conservation work of the Sumatran Orangutan Conservation Programme. The goal is to serve delicious, healthy, natural foods from nearby organic farms. By doing this we hope to create awareness of the importance of food quality and its relevance for our quality of life, health and well-being, whilst at the same time promoting sustainable livelihoods amongst the nearby communities.

The restaurant building will be equipped with function rooms to host corporate and social events (e.g. weddings), seminars, workshops and conferences. The restaurant's location will be at the intersection of the main artery road and the side road to the Eco Farm, allowing the application of a Farm-to-Table concept.

It will be a challenge to serve more than 200 guests in the restaurant and accommodate a further 100 people in the function rooms. The important task of designing this facility was taken on by well-known architecture firm TENTEN, led by its director, Ewe-Jin Low. The initial concept design has now been carried to the detailed engineering design (DED) phase, where structural/technical drawings and costings are being finalised. This process is led by our long-term partner Ozin Karya, directed by Erik Brandt. A bamboo construction engineering firm, Asali Bali, is partnering in the DED process with structural analysis and their expertise in bamboo work around the globe.

We are currently revising the most recent drawings and expect to receive the completed DED documents no later than mid 2022. Once we have these, we will be able to take the restaurant concept and design to potential donors, or to apply for a bank loan based on the developed Bill of Quantity and Business case. If we are successful in raising the required funds, we would very much like to begin construction of the restaurant in 2022, with a one-year long construction period anticipated. The sooner the restaurant can be operational, the sooner we can begin generating revenues to fund other aspects of the Orangutan Haven project, and eventually we hope, the wider SOCP.



Top view of the restaurant, depicting the overall layout and roofs as of March 2022

South-east view by March 2022, looking from the river side

17. Forest School

The Forest School (as it's currently named) will serve as an education centre for visitors, a base for the Orangutan Haven's education team and all education and interpretive services of the Orangutan Haven. It will cater for visiting groups like schools, university students, tour groups, etc., seeking more formal education activities, environmental learning, and a deeper experience than is offered to more casual visitors. Domestic and international schools are encouraged to move their classroom to the Forest School, profiting from the opportunity to intensify their knowledge and understanding of the natural world and sustainable development. They will be offered programmes, prepared by our education team and external experts, customised to their needs and in tune with their curricula.

To facilitate the Orangutan Haven`s education and awareness raising mission, Yayasan Ekosistem Lestari and its partner, the PanEco Foundation, plan to hold a "National Architectural Design Competition for the Forest School at the Orangutan Haven," which will invite architects and students to submit imaginative and innovative designs for the new facility, The competition will be launched when the 1st development phase of the Orangutan Haven is completed, when all necessary facilities for the soft-opening in 2022 have been established and funds have been secured.

18. Research/Ecology Centre

Located on the northern part of the Orangutan Haven in a valley with steep topography and swampy areas that were formerly rice fields, we plan to develop a facility that can be used by students and universities as a base for research at the Orangutan Haven, and allow visitors to understand the challenges of field research and its value in conservation.

PanEco and Yayasan Ecosystem Lestari invited the Singaporean University of Technology and Design to develop, together with students, a design for the centre. This collaborative project built on an existing institutional relationship between the Future Cities Laboratory, ETH Zurich, and SUTD. In 2019, we selected the winning design, named the "meandering ark". With some slight adaptations, the concept is ready to go into the next detailed structural design and technical planning stage, which as with the Forest School is scheduled to happen once the 1st development phase of the Orangutan Haven is completed and funds have been secured.

19. Bamboo Bridge & Workshop

An impressive 30 m long bridge crosses the river from the Haven's main entrance area towards the site's interior. This iconic "Bamboo Bridge" was designed by Swiss architect Lukas Zollinger, with professional inputs from bamboo specialist, Jörg Stamm, and was built by the YEL construction team in 2017. It is already a much talked about feature of the Haven amongst those that have visited and seen it and a 'must have' location for "selfie" photographs!

Back in 2017, during the bridge's construction process, a skilled team of 10 bamboo carpenters was formed for bamboo procurement and construction, and to run the bamboo workshop and storage facilities. Our bamboo team now supports all Orangutan Haven construction work, i.e., scaffoldings, markers, reinforcements, ladders, and temporary quick build structures meaning that most construction needs can be completed by the human resources already on site.

Bamboo procurement itself follows a number of steps: survey – harvest – clean – treat – dry – store, before it is ready to use. The Orangutan Haven bamboo team takes orders for traditional bamboo bells, furniture, building material and handmade bamboo straws, and its professional labour is also in demand to collaborate for construction outside of the Orangutan Haven. We also run monthly teaching sessions for our local labour force, focusing on various topics and introducing new ideas, to continually build their skills and abilities.

Bamboo clump survey in the forest

During the first quarter of 2022 we procured 378 giant bamboo poles, 100 siam bamboo poles, 425 belangke and kapur bamboo poles, 40 wooden planks, about 50 cordwood logs and several smaller cuts of bamboo and local wood found on site. As with bamboo, the treatment of wood with borax helps to immunise against boring insects and at the same time strengthens it by making the vascular bundle more dense. We have also planted another 74 new giant bamboo seedlings on site, which we continue to maintain.

Bamboo seedling nursery, where several species of bamboo are propagated

We are exploring the potential to introduce a resilient bamboo growth and harvest method to the local community around the Orangutan Haven. Most of our bamboo comes from nearby villages like Bintang Meriah, Sembahe, and Durin Pitu, where we are working with the local people to ensure that only mature stalks are harvested, and that cutting is only done during a waning moon, which aids in reducing populations of boring insects that might otherwise degrade the organic structure of exposed shoots. The goal is to establish a sustainable market for locally produced and harvested bamboo. However, creating a truly resilient bamboo market will require more effort and funding than is available at the moment. Our ultimate hope is to collaborate with the 1000 Bamboo Village Programme, gradually restoring 2 million hectares of degraded land whilst at the same time improving livelihoods among rural communities.

In addition to all the efforts made to sustainably develop the potential of bamboo in the region, we offer products, artwork and furniture from this beautiful material. We are happy to introduce a bamboo pricelist for 2022 and by current status already support the close by building sector with treated bamboo poles. More and more bamboo has reached the market.

20. Energy Supply Orangutan Haven

A project as large and complex as the Orangutan Haven necessitates a reliable and professional approach to generate clean renewable electricity. We estimate that when the Orangutan Haven is completed and fully operational the daily peak load will be 106 kW, with around half of that needed before then, after the 'soft opening'.

In 2018 a comprehensive sustainable energy concept for the Orangutan Haven, or "Energy Roadmap", was created with our partner 'Alva Energi', to identify appropriate ways to generate our energy supplies and meet our needs. For example, direct solar water heating systems might be suitable for the restaurant and guest houses, while lighting and electricity for exhibits and office needs could come from photovoltaic (solar) cells - which can be integrated into buildings. A separate solar station to charge the electric 'golf' buggies we hope to eventually have on site will be modelled to serve as an educational resource, explaining how solar energy is created and harvested.

The original Energy Roadmap now needs to be rethought and updated to the current status of the project, i.e., as the project develops and plans and designs become more detailed and refined we are constantly identifying new electricity needs that were not accounted for back in the early planning phase.

Furthermore, as the Orangutan Haven is a long-term project that will continue to expand and add new facilities, it requires a robust electrical configuration that is flexible and which can also be expanded as it evolves. As an example, photovoltaic modules and batteries can be added relatively easily to any and all existing facilities.

Below we highlight the two primary electrical energy supplies that are currently operational on site.

a. Micro Hydropower Plant (MHPP)

A 6,5 kW capacity micro-hydropower power plant was constructed in early 2017 at the front area to the Haven (car park area), and is fully operational. With a 4 metre drop (head) between the inlet and the turbine, and a water flow of 250 litres/second, we are currently generating 3.5 kW of power. Electricity is generated using a cross-flow water turbine (T14), licensed by Swiss Entec AG. The MHPP consists of the following components: a dam (wier), water intake, settling basin, fore bay, penstock pipe, crossflow turbine, generator, electronic load controller (ELC), balance load, power house and tailrace.

Every two weeks we maintain the water race and clear trash along the river upstream and around the water gate. We do have first designs for installing a trash rake in the river to try and reduce trash, and are keen to develop this further at a later stage.

The current system covers a small proportion of the Orangutan Haven's total energy needs, which currently is connected to the whole front area and all around the car park until the bridge and temporarily also it is feeding the Eco-Farm with clean electricity. As a back-up during potential floods and maintenance we make use of the national grid, PLN. Also it has to be mentioned that it will serve as a valuable educational resource.

b. Solar Energy

Thanks to high solar irradiance in the tropics, solar energy has huge potential. Certain facilities like the eco-buggy park and maintenance centre, and even the Orangutan Islands can be powered 100% by solar energy and backed up by an Uninterruptible Power Supply (UPS), without any need for fuel. After initial set up costs, solar electricity generation is also free of charge, and is of course much cleaner than electricity produced by a generator or the national electrical grid (PLN).

As the islands are remote, installation of a photovoltaic battery grid (PV Battery Grid) allows us to operate the Orangutan islands and houses, veterinary complex, keeper depot, canteen guardhouse, restrooms and all crucial infrastructure in the orangutan islands valley. The battery storage system we have for the islands produces 30.72 kWh, equivalent to two days of electricity autonomy with estimated loads about 12 kWh/day. The size of the PV modules is 6.21 kWp. Based on calculations of the total need of electric energy data we distributed the load accordingly to three electric phases. The energy produced is environmentally friendly, partially self-sufficient and economical, reducing operational costs.

To install the system our partner Alva Energi contracted a local firm, P.T. Wiric, to pull the grid cables and install the grid boxes. Load stabilisation and distribution will be controlled and optimised by the system of the producer, BOS in Germany, to whom data will be regularly sent via an integrated modem in the battery boxes. Due to the remoteness of the islands, however we have had internet connection problems and have as yet not been able to make this happen. We are currently to solve this problem with our partner Alva Energi.

Photovoltaic panels on top of the toilet unit at the islands

21. Organic Farming and Eco-Farm

The Orangutan Haven's large (48 ha) total area offers enormous potential to promote sustainable organic farming practices. A wide variety of cash crops, fruits and vegetables such as rubber, citrus, cacao, durian, spinach, pineapple, sugar cane, oil palm and many other crops are present throughout the site's existing traditional agroforest mosaic. Local villagers are employed to tend to the organic vegetable garden and the agroforestry crops, and we plan to develop a farming cooperative with the local community in the future.

Some of the Haven's agricultural produce provides fruits and vegetables for the orangutans at our nearby Quarantine Centre and some is sold on the local market. Similarly, once the Haven's restaurant facilities are complete, fresh fruits and vegetables will be sourced as much as possible on site, thereby implementing the "From Farm-to-Table" concept.

A plant nursery has been established which could be integrated into a permaculture system in future to showcase different cultivation possibilities. This nursery is our plant bank, providing the seedlings necessary for agriculture, landscaping and construction and we hope to add an aquaponics system to the nursery at a later stage.

Eco-Farm team

The Eco-Farm building next to the nursery was erected in 2019. It currently functions as a training facility for farmers, as an aula and shelter for visiting schools and other groups, and as a workers' hut and storage for seeds, crops and tools. It has a clay floor, using clay on site, after experimenting with several samples and methods the floor was laid during July 2021.
Recently the aula was equipped with a projector and screen and is now fully ready for educational purposes (since we do not yet have the Forest School). We also just finished the front yard by laying grass blocks and an additional drainage system, and erected a trash collection station.

Later on, once the Orangutan Haven becomes operational, the Eco-Farm will offer facilities for cleaning, preparing and packing all farm produce for our own needs (Orangutan Haven restaurant, stalls, EcoLodge Bukit Lawang, orangutan food, etc.), and for external sales to the public.

Water is a key concern for farming, of course, and we need to develop an irrigation system to deal with dry periods. For human needs, we will use the spring nearby to support the kitchenette, washing facilities and semi-dry toilet inside the building. We have also installed a bio-filtration tank at the site to ensure all wastewater is filtered and returned clean to the river.

Orangutan Haven consultant Yenni Lucia teaching about organic farming in March 2022

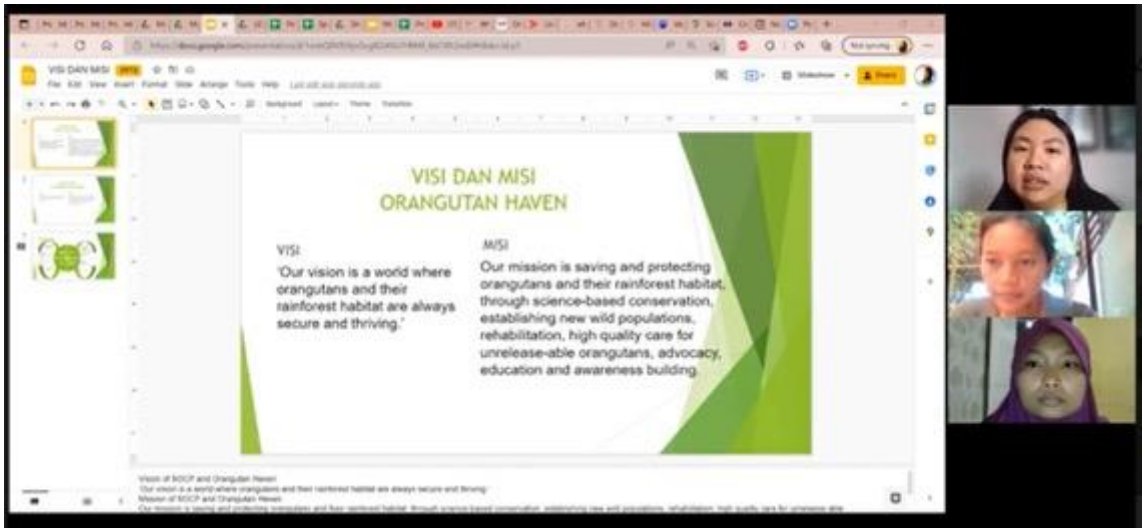
22. Educational Programme

Following development of the first Orangutan Haven teaching module in 2021, entitled "Biodiversity and Wildlife Conservation" during the first three months of 2022 the education team has been focusing on strengthening our education programmes and links to schools in the region.

With the strategic support from our education consultant, Tracey Yani Harjatanaya, the education team has designed a six-month programme that mainly aims to raise schools' awareness of the Orangutan Haven, while waiting for the infrastructure to be fully safe and ready to welcome visiting students.

The education team has also been working on developing their communication, organisational, educational, and technological skills to enhance their capacity under the close guidance of Tracey. A 4 day workshop is being planned to improve their skills in writing and developing new education modules and programmes. They will also learn more about the new concept of project-based learning, which is a compulsory new component under the national curriculum. The workshop is planned in collaboration with Yayasan Perguruan Sultan Iskandar Muda (a local school foundation) to allow us to benefit from their knowledge and experience.

Considering that education will be the main 'soul' of the Orangutan Haven, we plan to further strengthen the existing education team by hiring an experienced educator capable of managing the entire Orangutan Haven education programme and its implementation.



Online 'Zoom' meeting with Tracey, Riska and Mira from the education team in March 2022

For this task we have engaged with experienced zoo educators and as our qualified consultants. With the assistance and generous support of experienced zoo educators Stephen Woollard from ZooStephen.com in the UK and Constanze and Erik Mager from Burger's Zoo in the Netherlands we now have a draft of Orangutan Haven Education Masterplan and will continue to refine it with msite visits, trials and online workshops over the coming months.

A primary goal of the Orangutan Haven is to promote nature conservation and sustainable development, in a unique and highly innovative way, potentially changing people's attitudes and behaviour towards wildlife and the environment generally. The Orangutan Haven will become a remarkable destination and asset for tourism, schools, universities and other groups throughout the region and beyond.

In order to promote the Orangutan Haven we will of course make extensive use of social media tools. We will target school groups, youth communities, local and international visitors, and the travel and hospitality industry. Initially the content is focussing on introducing the Orangutan Haven to the audience; explaining why it is being built, what kind of facilities it will have and for what purpose. Statistics from the social media will be monitored monthly so that we can continuously adapt and refine its use to maximise its potential.

The Orangutan Haven website is at the development stage and will be connected to our affiliate websites and social media very soon. Much progress has already been made and the website is operational on a trial basis.

As stated, the Orangutan Haven has already been used by many schools, both local and international. To date, the education programmes and activities we have offered have been very informal. The corona virus pandemic has of course prevented visits in the last 2 years, but this has allowed us to focus and make good progress on developing the concept, the team, the materials and the methods for the Haven Education Programme. Today, with schools now finally starting to go back to the classroom, we predict the number of schools wishing to visit and make use of the resources we can offer will gradually start to increase again during 2022.

23. Eco-Nature Trails

The Orangutan Haven will become a major asset for education and recreation for the people of Medan, schools and other groups, and tourists, both domestic and international. It represents one of few, if not the only truly "green field" recreation site less than 2 hours' drive from the city (2.5 to 3.5 million people). Once planned facilities are operational - restaurant, rainforest centre, forest school and of course the orangutan islands themselves – visitors will take part in both formal and informal activities and be exposed to both formal and informal education programmes and interpretive materials.

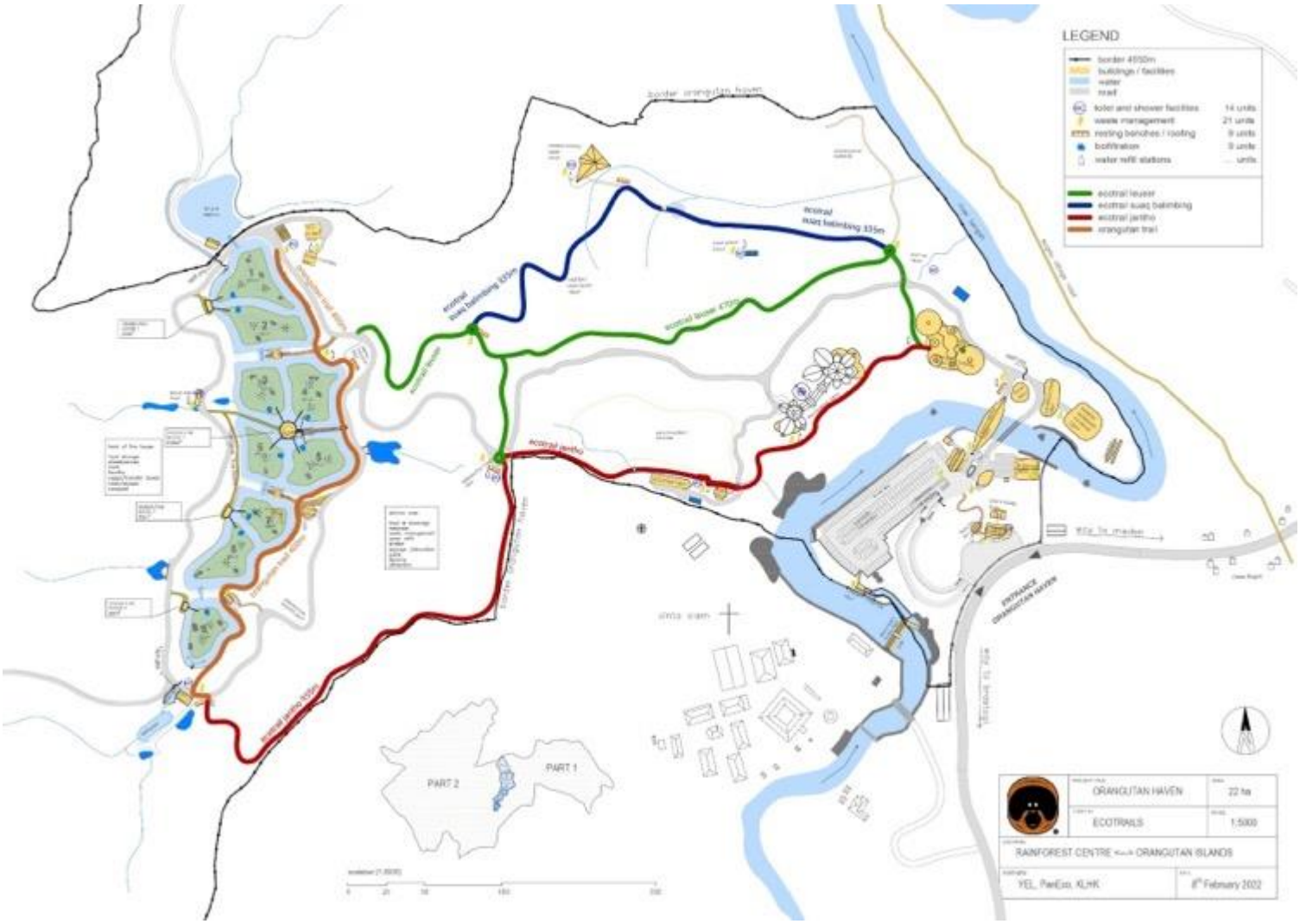
Formal education programmes, e.g. for schools and other organised groups, will make use of 'trails/footpaths' snaking through the Orangutan Haven's mixed agroforest landscape.

In an attempt to encourage physical exercise, all visitors will be encouraged to explore these trails too, to the maximum extent that they are able. The hope is that vehicles at the Haven can be kept to a minimum. It is envisaged that some golf buggies will be available, at a price, to those that are not able to walk very far and as far as possible visitor movement around the site uses these forest trails. Whilst there is a main artery road, from the bridge to the orangutan islands, the hope is that this does not become the main thoroughfare for visitors, but that they use the footpaths/trails instead, as much as possible.

For much of the length of these trails the environment is wooded. Despite being mixed agroforest, and not "true rainforest", to the average visitor it will appear very much like walking through a true rainforest. Many aspects of rainforest ecology can be found along the trails, and are therefore potential resources for education and interpretive materials.

Visitors will be able to walk along three main loops named after field stations managed by YEL in Sumatra "Leuser", "Suaq", and "Jantho" along which objects of interest are currently be identified and will be explained using signage and other interpretive tools.

At a later stage, agricultural exhibits, such as a banana and mango arboretum, etc., will be planned to display the incredible diversity of agricultural crops, which are rooted in the genetic diversity of the rainforest flora.



Orangutan Haven Eco-trail master planning by February 2022

24. Public Toilet Units

The current masterplan for the Orangutan Haven includes five separate public toilet units; two in the orangutan islands valley, one at the entrance (just after visitors enter or before they exit, one accessible from the car parking area, and one main unit opposite the Rainforest Centre (Rimba Raya). Toilets will also be incorporated in the restaurant and forest school design.

The toilets will be constructed to meet key requirements, such as low maintenance and low energy use, i.e., natural light, natural ventilation and natural resourcing. Apart from that, the units will be universally accessible and equipped with child care facilities. Moreover, they will also be designed to induce a “wow” effect – after all, a place we use several times a day should ideally have some excitement and beauty to it.

The public toilet unit at the veterinary complex was the first to be erected and completed, in 2021. This one unit was especially critical, because its roof is home for the photovoltaic panels and the battery storage system is housed inside.

When visitors will begin formally coming to the Haven, i.e., the soft opening, it is essential we have toilet facilities in critical locations. Construction of all other units will therefore start as soon as the design is agreed upon and funding is secured. Our current priority is the toilet unit located at the arrival area, near the planned ticketing booth, for which we expect to have a design and construction drawings ready during the coming months.

25. Songbird Aviaries

The last several years have seen conservationists globally increasingly concerned about the status and plight of a number of notable Sumatran birds species including the Silvery Pigeon, Helmeted Hornbill, Crested Jay, White-rumped Shama, Asian Pied Starling, Hill Myna, Aceh bulbul, and the Sumatran silver-eared Mesia. Heavily hunted and collected are some of the better singing birds, as these can win significant prizes in singing competitions. Much sought after species like the Straw headed bulbul (possibly now extinct in the wild in Indonesia), the Barusan islands white-rumped shama (some races probably already extinct in the wild), the Sumatran laughing thrush (declining rapidly) and the Nias Hill Myna (known from only one small island and already extinct in Nias), are of particular concern.

In response to this alarming situation and on the recommendation of the IUCN Asian Songbird Trade Specialist Group following the first Asian Songbird Trade Crisis Summit held in Singapore in 2015, and the European Zoo Associations Silent Forest campaign, we are building 24 specialist aviaries and supporting infrastructure, in an attempt to establish captive breeding programmes for these species, to try and prevent their extinction from the wild altogether.

The location for this facility is at the back of the Orangutan Islands down a short road in an area that will be closed to visitors to minimise disturbance and stress. The first phase of construction was completed by mid 2021, namely the food storage/office building, and the foundations and low walls of the aviaries. The second phase was completed more recently, assembling the metal aviary frames, adding the mesh and finally the roofs, guttering and drainage. Lastly, the contractors are currently constructing an additional small building with toilets, storage and a battery room for the solar panels we plan to install at the site.

Planting of the aviaries, and landscaping are now well underway and being done 'in-house' without a contractor. Water supplies to the aviaries and buildings were installed in March this year and we are now also focussing on training of a few key staff members who will develop the bird husbandry schedules and protocols with support from experts around the world. Installation of solar panels to provide electricity is planned for the next quarter. Once all is completed and birds begin to move in we will also need to add CCTV coverage to the aviary site – since thefts of the more desirable, and hence valuable species are always possible.

Construction work on the aviaries by beginning of March2022

On the left the aviaries, middle restroom and to the right the storage by March 2022

26. Construction and Consultant Team

YEL's lead coordinator for the Orangutan Haven project from the start is engineer Suherry Aprianto. He is a founder member of YEL and planned and supervised construction of the SOCP's firat facility, the Orangutan Quarantine and Rehabilitation Centre in 2001. A skilled architect from Austria, Gilbert Murrer, with experience in sustainable architecture, building materials and landscaping, works closely alongside Suherry as construction coordinator. Jhon Saragih, a local architect with a 'site supervision' background has joined the team last year and is permanently present on site as the main supervisor of all activities.

Between 2017 and 2020, we contracted a local design and construction company, Ozin Karya, led by Henri Iskandar, Erik Brandt and Tonggor Tts. They are architects and civil engineers with many years of experience in the Medan area and assisted in building the site and procuring necessary staff, materials and equipment. The Ozin Karya team is currently working on the detailed engineering design of the restaurant we wish to build as soon as possible.

Swiss architect, Lukas Zollinger initially drafted the masterplan with all major buildings and was present on site for the first year of the Haven's construction. He is currently developing the design concept for the Rainforest Exhibition Centre.

Andrea Fitrianto, a member of Architectes Sans Frontières and the Indonesian Architect Association (IAI) are providing their well appreciated input and share of knowledge.

An ambitious student competition was carried out in collaboration with the Singapore University of Technology and Design (SUTD) with the goal to share bamboo knowledge and develop the design for the planned Research/Ecology Centre. Felix Raspall, from SUTD, and Sebastian Linsin from the Future Cities Lab (FCL) are the leading professionals behind the competition.

The company „Bureau" in Singapore generously offered to develop 'pro-bono' a corporate design for the Orangutan Haven. The corporate design is now the basis for all graphic products and media related directly to the Orangutan Haven. The logo on the front of this report was their first step.

For bamboo construction, the team is supported by German bamboo architect and master carpenter, Jörg Stamm, who has pioneered many bamboo construction techniques all over the world.

Alva Energi is a Jakarta-based Indonesian renewable energy firm. They helped us to produce the 'Energy Roadmap" identifying the electricity infrastructure that needed to be developed. This team is led by Oktoviano Gandhi and Christoph Luerssen.

Andy Short, a former school teacher and conservation enthusiast joined for two years, 2019 - 2020, as a consultant to the YEL education team to help develop the concept for the educational programme and signage.

Scenographer Stefanie Frey and graphic designer Eve Huebscher have been working since 2019 to develop a convincing exhibition design and conceptual guidelines for the Rainforest Exhibition Centre. Ernest Goh, a Singaporean artist and photographer is also lending his experience and ideas.

Architect Ewe-Jin Low, former lead architect of IBUKU and director of a Melbourne based architecture firm, TENTEN, delivered the concept design for the Restaurant. He collaborates with Spanish architect Javier Diaz, who is also very experienced in southeast Asian architecture. Apart from the Restaurant, both contribute their knowledge to tackle the sustainable architecture issues of the Orangutan Haven.

A team of volunteers from RAW Wildlife Encounters dug out the bio-filtration tank at the Eco-Farm in 2019, and another group was expected for April 2020, but was postponed due to the current global pandemic.

Nadia Riley, zoo designer and founder of HAZKOBA, finished her voluntary work on the Orangutan Haven's car park and entrance area by the beginning of 2020.

A new local partner, P.T. Alam Jaya, commenced work in the second quarter, tasked with construction of the Aviaries and the road to there. They are also responsible for 24h security at the Orangutan Haven.

David Miller, a Land and Construction Survey consultant in Medan, did several topographical surveys on site. Before any construction began he surveyed the proposed artery road route and then continued to other parts of the site such as restaurant area and lately the car park and entrance area of the Haven.

Tracey Harjatanaya & Nadine Sugianto, joined the team as consultants for the environmental education programme in 2021 and we were very fortunate to obtain expert contributions from Constanze and Erik Mager, of Burger's Zoo in the Netherlands, who together produced the first draft of the Orangutan Haven Education Concept and Masterplan, generously volunteering their time to do so. Finalisation of the enrichment infrastructure is being led by experienced zoo educator Stephen Woollard, of ZooStephen.com, in the UK.

Swiss construction worker and hobby photographer Nathan Berther volunteered with us early 2021 for two weeks, leading the clay floor construction at the Eco-Farm building and documenting (photographing) the progress of work on all of the Haven facilities.

In 2021, the Orangutan Haven project received support from well known, international engineering firm ARUP, who have been helping us in four main areas; Traffic Circulation Strategy, Education Centre 'Forest School' Concept Design, Nature Trails Advisory and Islands Flooding Management & River Scouring Assessment. This support is targeted until mid-2022.

Several professional civilian servants have contributed their knowledge and experience. We are grateful to the following for their efforts: Andri Schmid (civil engineering, 2016), Daniel Petrasinovic (architectural, 2017), Arion Katana (bamboo bridge model, 2017), Lorenz Diefenbach (agroforestry and Eco-Farming, 2018), Gabriel Tanner (civil engineering, 2019), Stefan Banz (water and wastewater treatment, 2019), Nicolas Schwob (garbage collection infrastructure, 2019), Yves Luchsinger (project management tasks, 2019) and Markus Nyfeler (architectural design and technical drawings, 2020).

From November 2021 to February 2022 we had Iwan Tejo Manullang and Toni Sumuang Hutabarat as field work interns from polytechnic WILMAR, supporting organic farming at the Orangutan Haven.

Currently two students from the University of North-Sumatra (USU), Ari Maringan Gabriel Siburian and Sindy Hutapea from the faculty of forestry, are doing their out-of-campus practice with the bamboo procurement team.

We also want to thank Dr. Ian Singleton, Diana Kosmanto, Heli Lie, Hetty Damanik, Melda Sinaga, Khairuddin, Irwin Irwinsyah, Asril Abdullah, Citra Hasan, Riska Dayanti Situmorang, Mira, Yon Maryono, Suman Ginting and Yenni Lucia our core team here, Regina Frey and the PanEco team based in Switzerland, and many, many others who all play a key role in promoting, fundraising or otherwise supporting the Orangutan Haven's development.

Car-park meeting with our geotechnical consultants from CV Jo Lau Utama

Honeybee keeping of 3 api mellifera bee hives at the Orangutan Haven

Suherry giving lessons to staff about waste management

Security officer Benget Sinaga briefing his team

Happy visitor, Volta, exploring the Haven with his dog

Simpei SInulingga, on the left, delivering a traditional karoneses bamboo weaving ornament

27. Permits and Licenses

Permits from the Government of Indonesia are required to build and to operate the Orangutan Haven. The current progress in permit collection is outlined below:

Kind of permit	Description	Requirement	Estimate time	Progress
1. Izin Peruntukkan dan Penggunaan Tanah (IPPT)/Land use permit	This permit is to allow us to use the land as a Zoo, recreational park, botanical garden, tourism etc.	1. Foundation legal document 2. Land purchase document		100% (done) 1st quarter, 2019
2. Sertifikasi tanah/ Land registration/Land act	This act or land act is to announce YEL as the owner of the land and guaranty YEL's right to manage this land for the period 30 years and can be prolonged for 20 years.	1. Foundation legal document 2. Land purchase doc 3. IPPT (Done) 4. Tax 5. Local government		100% (done) 1st quarter, 2022
3. Izin Lingkungan/Environmental Licenses	An environmental permit is required to obtain a business license for any business and/or activity for which an AMDAL (Environmental Impact Assessment) or Environmental Management and Monitoring Program (UKL-UPL) is required. In this case Orangutan Haven project is obligated by local government to have an AMDAL.	1. Foundation legal document 2. Land purchase doc 3. IPPT (Done)		100% (done) 3rd quarter, 2020
4. Izin Lembaga Konservasi (LK) / Institutional Conservation License	This permit allows allows us to develop and manage a zoo and breeding or similar conservation program and in this context to ask for entrance fees.	1. IPPT (Done) 2. Land registration/act, (in process) 3. Foundation legal document (Done) 4. Local government recommendation (Done) 5. Environment Impact analysis (AMDAL, Done) 6. Environment Licenses (Done)	2nd quarter, 2022	In process
5. Izin Mendirikan Bangunan (IMB)/Building construction permits	This permit is to allow us to build the buildings at Orangutan Haven. The permit can be one permit for all of the buildings or a single permit for each building.	1. IPPT (Done) 2. Master plan (Done) 3. Building design (In process) 4. Environment Impact Analysis (Done)	Depend on the availability of the land act	In process, following izin lingkungan progress. Preparation of all the requirements

28. Environment, Health & Safety

Protecting the environment and maintaining health and safety at the Orangutan Haven are practices that we implement to prevent harm to anyone. Every facility has a fire extinguisher and eleven CCTV cameras keep a constant watch on the entire islands' valley, where else the front area is also equipped with 6 cameras observing all potential entrance points. Handwashing stations are provided at all major points of entrance and meeting points.

From an environmental standpoint we are taking a systematic approach to manage waste or air emissions all the way to helping reduce the Orangutan Haven´s carbon footprint. Currently our waste bins are reused woven bamboo baskets for non-organic matter. Organic matter to a small extent is thrown into the woods at the moment, until the concept for recycling and reuse is worked out completely, e.g., a compost digester will be installed at the keeper depot mainly for trash from the Orangutan islands. Later on, we hope to be able to design and install a trash rake for river cleaning.

Up to today we offer basic waste management and segregation lessons to the Orangutan Haven team and some of the surrounding communities. Currently we are in trial of a waste segregation system at the Eco Farm, where 3 types of main waste disposal bins are introduced. We would like to get more of this all around the Orangutan Haven and started to communicate with Roda Hijau, a waste management firm based on community development.

Heni sponsoring more than 20 raphis excelsa palms

Better health at its heart means the development of safe, high quality, and environmentally friendly processes, working practices and systemic activities that prevent or reduce the risk of harm to people, plants and animals on site.

29. Challenges

The Orangutan Haven project is highly innovative and ambitious. The construction of the orangutan islands is a pioneering endeavour, which cannot rely on any reference project anywhere in the tropics. This means the project has huge potential, but it also entails some risks and challenges, especially unpredictable costs.

We have attempted to highlight some of the challenges below according to their priority. As the Orangutan Haven new challenges arise, mitigation strategies are being developed and implemented.

- The project is in need of qualified and highly specialised labour which is frequently not available in Sumatra, and not easily at hand for a nature conservation NGO. Employment of qualified services is costly. Therefore, we are very grateful for qualified civilian workers, volunteers or Interns.

- Apart from giving un-releasable orangutans a better life, the most prominent feature of the Orangutan Haven will be education. It is a priority to create an educational concept, including recruitment and training of suitably qualified and experienced staff.

- The land where the main spring supplying water to the islands valley is not part of the Orangutan Haven site itself (not owned by us), and there is therefore always a possibility that the water supply to the valley could be impacted if the land use around the spring is altered by our neighbour. We would very much like to purchase this land if possible, to gain full control of what happens at the spring location.

- Generally, bamboo harvesting in Sumatra is unsustainable, as the whole clump is cut. We need to build bamboo capacity within communities, ranging from bamboo cultivation, harvesting techniques, building technology to market development. Funds are being raised to invest in such a programme.

- To fully operate the site, local staff must be trained, especially orangutan keepers. Accordingly, we have started a trainee programme with our nearby Orangutan Quarantine and Rehabilitation Centre. An additional operational team is being trained to handle maintenance and security.

- To transmit the spirit of development for the Orangutan Haven project to the surrounding community, community projects are needed as a medium of communication, such as and not limiting to a sustainable community farming project, sustainable village infrastructure project, village disaster management plan, bamboo plantation and school waste management projects.

30. Outlook & fundraising priorities

The islands are now ready for the first un-releasable orangutans to move in. Unfortunately, due to government bureaucracy and the need for the appropriate permits and licences, we predict that the first orangutans will move in during 2022. We are still trying hard to accelerate this process, and are optimistic that good progress is at last being made, but cannot promise anything at this stage.

Considerable work remains to be done at the Orangutan Haven but our experience is that – with sufficient funding available – we will be able to make good progress. With the orangutan islands themselves now pretty much completed, we are now turning our attention and fundraising efforts to other aspects of the project and masterplan. These include, but are not limited to:

- **Restaurant** – for general visitors and corporate events, weddings etc.; Detailed Engineering Designs already exist for the restaurant. **Having the restaurant operational will allow us to generate revenues that will help fund other aspects of the Haven.**

- **Ticketing** – to enable the soft opening of the Orangutan Haven we will need to have some form of ticketing system and a means of checking and selling tickets at the entrance. This facility **will be a high priority in 2022**.

- **Forest School (formerly Education Centre)** – for schools and other groups to study and learn about nature, ecology, conservation. **The Forest School will be a major asset for education and the many thousands of school children throughout the region.**

- **Rainforest Centre (Rimba Raya)** – reception, rainforest exhibition, administration, seminar rooms (first floor), first aid, office and other facilities to receive and serve visitors.

- **Research/Ecology Centre** – to promote interest in field research among young people, as well as to conduct research projects on site.

- **Organic-Farming & EcoFarm** – for production of fruits and vegetables, while serving as a training and interpretive facility for organic agriculture, addressing professionals and visitors.

- **Education team** – qualified staff to begin developing and designing nature trails and curricula for interpreting the OU Haven for visitors and school groups; including educators training.

- **Bird-Watch Tower** – experiencing the local bird biodiversity from the highest point of the Orangutan Haven

- **Fruit Bat Enclosure** – to inform visitors about the amazing value of these creatures in an attempt to reduce local demand for bats as traditional medicine and thus reduce the local trade in them.

- **Public Toilet Units** – for visitors and staff in form of bio-filtration toilets.

- **Maintenance Centre** – a centre where all kinds of repairs and small production jobs join up.

- **Eco-Buggy Park** – to charge the batteries of those future visitor vehicles, photovoltaic panels will be of use, creating a showcase for alternative energy at the same time.

The following activities are scheduled for the second quarter of 2022:

a. Continuous permits and licenses paper work
b. Continuous updating of Orangutan Haven masterplan and technical drawings
c. Islands construction and Orangutan houses: climbing ropes, nets, hammocks
d. Additional overflow at Orangutan Islands, and main stream retention walls
e. Off grid PV Battery grid at islands: connecting to BOS system
f. CCTV system operational imporovements
g. Veterinary clinic furnishing
h. Main artery road and side roads, maintain until funds are available for final layer
i. Parking area: start of construction
j. Organic farming (Eco Farm) operations
k. Micro hydro power plant (MHPP): maintenance and research strategies
l. Landscaping and gardening activities
m. Finalize technical drawings (Detailed Engineering Design) for the Restaurant
n. Construction of the Ticketing Booth and design for the public toilet at Arrival area
o. Border fence security continue construction
p. Eco-Trail, conceptualise and coordinate
q. Finalise construction of the songbird aviaries building
r. Team-building and personnel structure
s. Continue work on Orangutan Haven corporate design and public relations
t. Fundraising and financial security
u. Enhance Security of the land, uplifting security operator
v. Continue set-up of a website and social media accounts for updates
w. Build waste segregation at Front House
x. Bamboo procurement and production
y. Fundraising for a new transport, people and material, vehicle

ORANGUTAN HAVEN

31. Acknowledgements

Needless to say, none of the above would, or will be possible without continued help from the Haven's many supporters and donors!

For major donations we thank Swiss Symphasis Foundation (symphasis.ch) and German ETN (etn-stiftung.de), the European Animal Protection and Nature Conservation Foundation.

Many thanks are also due to Orang-Utans in Not e.V., Animal Friends Pet Insurance, Arcus Foundation, and Orangutan Outreach for their support of the Orangutan Haven.

The increasing costs of the challenging access road construction were covered thanks to two generous private Swiss donors (Mr. Robert and Mrs. Henrietta). Elaine Fairfax from the UK gave an extremely welcome donation to the islands valley area during the early stages.

For their generous support of the new bird aviaries and conservation programme we would like to thank Fondation Segré, Beauval Nature Foundation, Durrell Wildlife Conservation Trust and the European Association of Zoos and Aquaria (EAZA) Silent Forest Campaign.

Big acknowledgement goes to Deutsche Postcode Lotterie, who are funding the development of the environmental education programme and with that main infrastructure needs.

Generous donations from private Swiss donors covered unexpected costs arising during Orangutan Islands' construction and promoted the establishment of the Orangutan Haven's restaurant.

Considerable funds must still be raised to complete Orangutan Haven. We hope that corporate and institutional donors, as well as individual donors will contribute to complete this pioneering and ground-breaking project.

THANK YOU!

PanEco

YAYASAN EKOSISTEM LESTARI YEL

April 1st 2022