

Permaculture Design Concepts for the Luwawa Environmental Interpretation Centre

Compiled by the Nordin Family, June 2021

Permaculture is a holistic design system. The term ‘holistic’ is characterized by the belief that the parts of something are intimately interconnected to the whole. Therefore, Permaculture implementation cannot be viewed in isolation from every element on the site which is being designed. With this in mind, good Permaculture Design follows a three-step process: Observation, mapping, and design.

From June 07-09, the Nordin family were invited to the Luwawa Forest Lodge to give advice on the implementation of Permaculture Design ideas for their new Environmental Interpretation Centre. During this time, the Nordins conducted the phases of observation and mapping. After taking the time necessary to process their findings, they have now completed a design for the area mentioned.

What follows is a summary of their findings:

Observation—During the observation phase, we were able to define the boundaries of the areas being designed. This area runs approximately north and south, and slopes downwards in both directions towards a small stream that exits the Luwawa dam and runs from the west to the east. There is a predominate wind which blows from east to west, and a dirt road which runs through the middle of the plot. This road presents issues of dust and noise for future events taking place at the Centre. The land on the east of the road is primarily wetland (dambo), sloping upwards



into an area currently being used as a forestry nursery. The land on the west is where the Centre has been constructed and a diversity of trees have been planted. The Centre has also installed solar panels for the generation of renewable energy.

Through interviews with the Luwawa staff and ownership, it was determined that the Centre will offer environmental activities and education to school groups and community members. This includes the demonstration of sustainable practices such as: renewable energy (with the possible addition of wind and hydroelectric power), composting toilets, fuel-efficient stoves, and the planting of indigenous species. Picnic areas will provide areas for visitors to relax and there may be the possibility of having plants for sale from the nursery area to generate additional revenue.

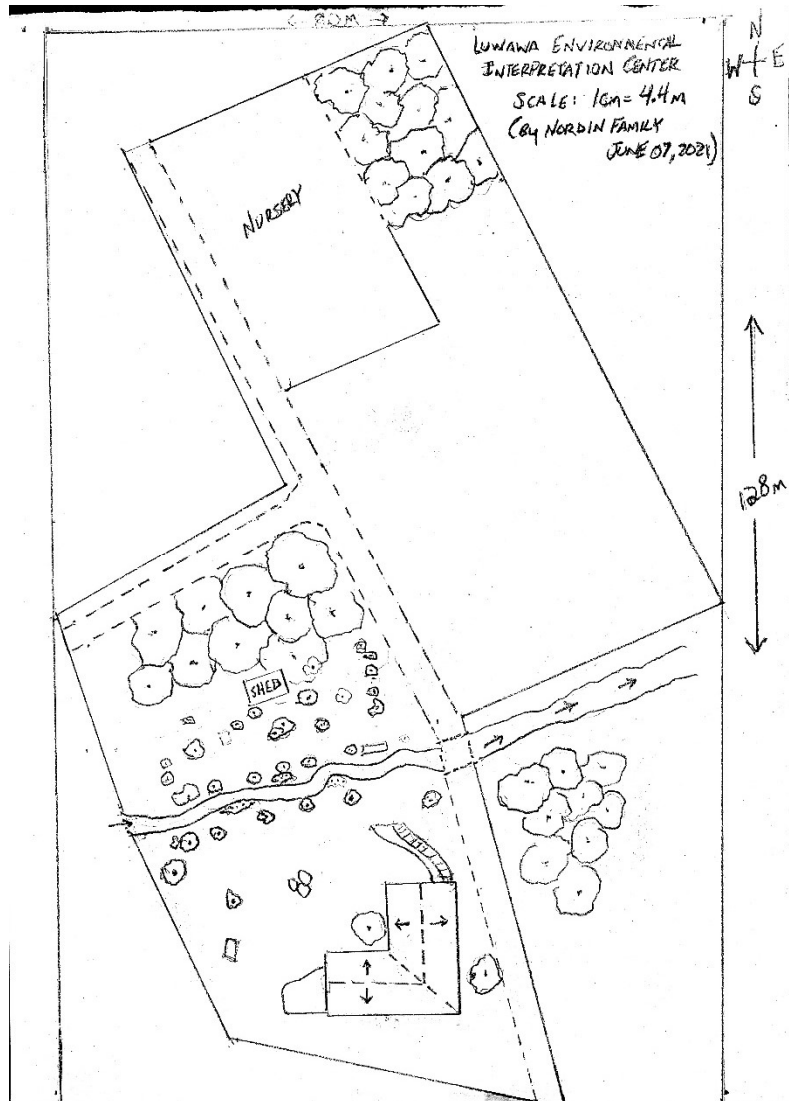
Mapping—A base map of the area was drawn by the Nordins and includes as many of the currently existing features as possible. A map is used in Permaculture Design to provide a record of existing resources and to offer a starting point for design ideas that will subsequently

be added. A map also offers a historical record of each site being designed, which can be revisited over time to review that changes that have been implemented. The map which is shown is oriented north-south, and includes a view of key elements such as: the Interpretive Centre, the nursery area, the main road, the stream, the small shed which is currently being used to store tools and for cooking staff meals, and the main trees located throughout the property. The site being designed runs approximately 128 meters north-south, and is approximately 80 meters west-east.

The roof of the Center has a sloping metal roof in which the drainage angles are indicated. There is a wheelchair-accessible ramp and stairs being constructed on the north end of the building. The main road slopes fairly drastically from the north end of the site down to the stream, and there is a gentler slope from the south end of the site towards the stream.

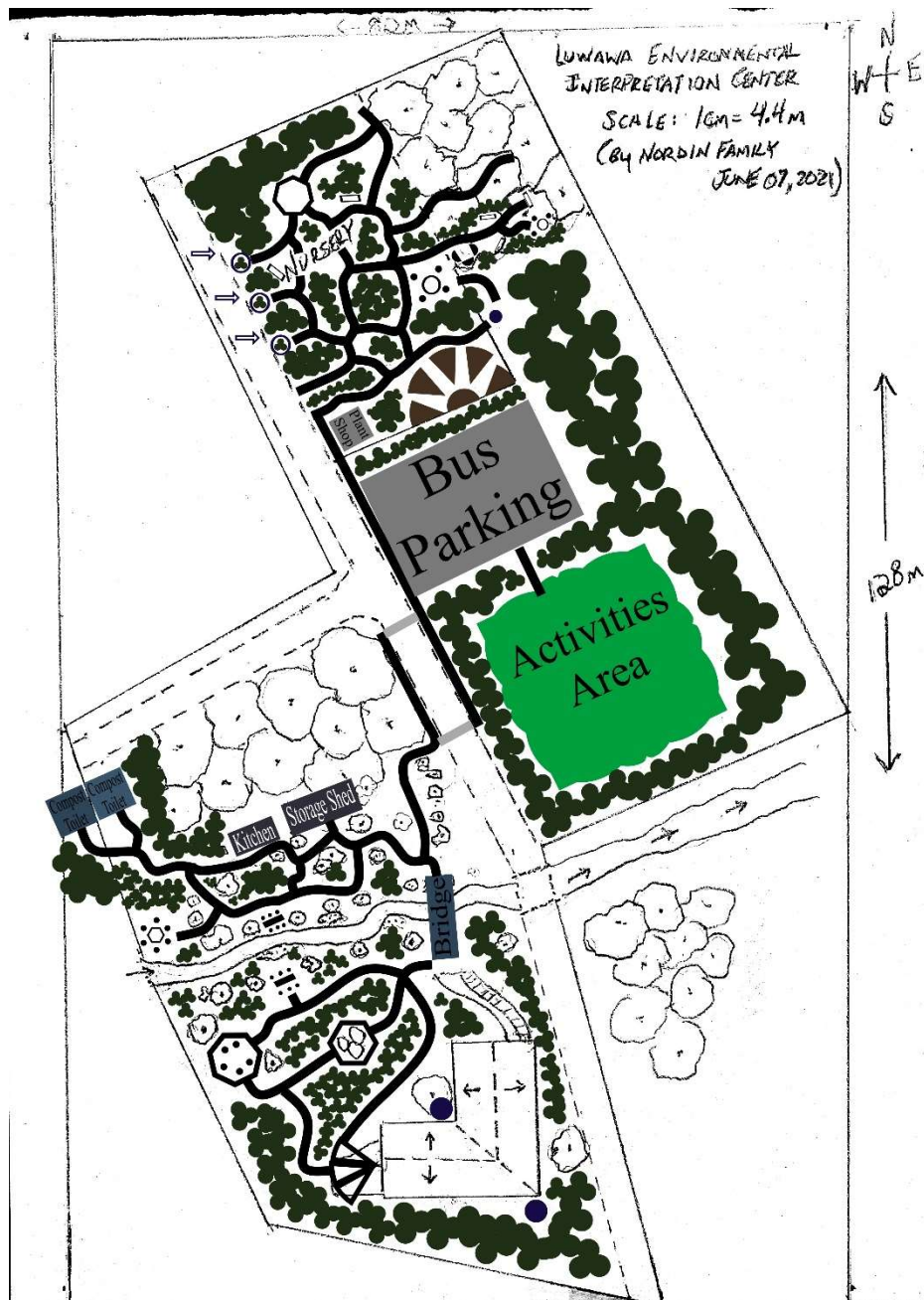
At the north end of the nursery site, there is a grove of large pine trees which will be possibly be cleared before any further implementation in that area. There are also large trees behind the shed and along the southeast side of the road. Many of the other trees on the site have been recently planted and are currently about one meter in height.

Design—A *Permaculture Design* is most simply a plan for the future. Good designs incorporate the integration of elements so that each element helps to support all of the others. This is done by applying the lessons learned in the observation and mapping phases to help add design features which help to meet the needs of the site. In this instance, the *needs* of the site include: opportunities for environmental education aimed at both children and adults, the demonstration of sustainable practices, and the accommodation of groups of around 20-40 people in size.



The design ideas that we are proposing should help to integrate the use of the nursery area with the area around the Interpretive Centre. The idea is that the nursery area would eventually be part of the educational process in helping people to identify indigenous species, produce plants for sale, and be an enjoyable area to explore the demonstration of sustainable designs.

Permaculture employs two main design tools, known as *guilds* and *zones*. Zones serve to help designers to conserve or harness energy, and in producing a harmonious flow throughout the site. *Zone 0* is the starting point where there is generally more energy and resources available



for use. In this instance, the Interpretive Centre could be considered to be a future *Zone 0* area, as well as the addition of a small kitchen area. These are areas where there may be more human activity and even provide access to grey water or compost material. *Zone 1* is often a high-maintenance irrigated garden area. This may include water harvesting off of the roof of the Interpretive Centre or any other future buildings. But for this site, there may not be a consistent flow of people or visitors on a daily basis, so the *Zone 1* areas may be limited in size and located in close proximity to water sources, or just consist of an irrigated nursery on the east side of the road. *Zone 2* tends to include more orchard types of fruit trees, perennial food crops, and other low-maintenance species of useful plants. It may also include the addition of small animal husbandry, composting toilets, picnic areas, or small gazebos and outdoor classrooms. This site

is well-suited to the establishment of *Zone 2* areas. *Zone 3* is often rain-fed staple crop areas, or areas with larger animals such as cows and goats. This site is not particularly suited for *Zone 3* production. *Zone 4* is a managed woodlot. *Zone 4* might be appropriate for the north end of the nursery area, along the east side of the main road, or behind the shed area. *Zone 4* can provide agroforestry species, fuelwood, medicinal plants, income generation, and even things like beekeeping, nature trails, tree houses, or seed collection. *Zone 5* is the forest and often provides valuable lessons from nature, which can be applied to other areas in the design. *Zone 5* surrounds this entire site, including the dam area, and is also important for providing habitat for larger animals and birds.

Guilds are groupings of plants, animals, and other natural resources which work together to improve growth, yields, and use. Guilds can be incorporated into all of the zones, and they work through functions, rather than species. Every good guild should include things that meet the needs of the site (food, medicines, fuel, income, etc); things that feed the soil (compost, mulch, nitrogen fixers, etc.); things that dig the soil (tubers, deep rooted plants, worms, etc.); climbers and supporters (vines on trellises, ivy on buildings, beans on trees, etc.); protectors and attractors (strong smelling plants, living fences, brightly colored flowers, bird baths, habitat, etc.); and groundcovers (mulch, rock gardens, creepers and vines, etc.).

Guilds are recommended for implementation throughout the site, with special attention given to the use of indigenous species. The species and makeup of these guild will differ depending upon their placement within the site, intended use, and types of growing conditions.

In the design shown above, we have tried to demonstrate examples of how pathways can connect different areas within the design (e.g. picnic areas, toilets, kitchen, outdoor classrooms, etc.) The areas between these pathways offer potential for the establishment of guilds within their respective zones. The pathways across the road should be limited for the safety of people crossing amid the use of the road by vehicles, motorcycles, oxcarts, and logging equipment.

We have proposed the construction of composting toilets at the northwest corner of the site and surrounded by guilds to help provide privacy. This location takes advantage of the easterly wind and allows for their use without having to cross the road. The kitchen is also placed in the northwest to allow the easterly wind to keep smoke from blowing through the site.

The area across the road, on the east, could be used for an activity area (depending upon the wetness of the soil, which could be raised a bit with the addition of soil, sand, or gravel), and would provide a place for larger group activities, sports, or team-building activities. North of the activity area, we suggest a possible parking area for buses or other vehicles.

The nursery area can be integrated to include small gazebo sitting areas or outdoor classrooms, benches, pathways, *Zone 2* guilds, and educational signs about Permaculture designs, the uses of indigenous plant species, and ecology. We suggest digging a new water source near the southeast corner of this plot, which would reduce the work involved in irrigating the nursery area. The nursery could be used to propagate and promote plant species which are unique to the Luwawa area and then sold from a small shop located on the site. We have also made recommendations for harvesting water off of the road into the nursery area to help prevent erosion and utilize runoff into banana pits or fruit trees. Guilds could also be established between the road and the Interpretive Centre to help reduce dust and noise from traffic.

The following are a few illustrations of how designs may be integrated. These pictures are not *firm design* plans, but rather ideas for how elements can be layered into the implementation process:

Bridge Area



Water Catchment



Picnic Areas



Nursery Area



Nursery Area



Water Management



Conclusion:

We hope that these design ideas help the Luwawa team to envision the implementation of sustainable solutions. These recommendations should help to provide ways to enhance the overall goals of the Environmental Interpretation Centre, while simultaneously providing for the needs of the site as a whole. The Design ideas presented here are open to interpretation by the Luwawa staff and will need to be customized and modified to make the best use of the space provided. Good luck with your future endeavors and thank you for allowing us to be part of the process.

Sincerely,
The Nordins
(www.NeverEndingFood.org)