



# Garden of Ganesh

*- A permaculture design for a Forest Garden -*



*Benjamin van Ooij  
April 2011  
Sankhu. Nepal*

## Site Survey

Type of site:	Terraced field which is currently unused.
Size:	500m <sup>2</sup> approximately.
Slope:	Gentle slope towards south-east.
Aspect:	South facing.
Altitude:	1500 meters.
Water source(s)	Upper terrace water taps at buildings, water hammer from below lower-terrace.
Micro climates:	Terrace walls on upper terrace on west-side, Trees cover the east-side.
Building(s)	On the upper terrace there are buildings.
Pollution:	1 waste-burning place in field.
Access:	Walkway from upper terrace to lower terrace and south-located field.
Soil:	Poor quality, rather silty with some (fine) gravel. The site has been cleared of topsoil by a JCB half a year ago. The soil looks depleted and very compacted. Small Gullies from upper terrace show waterflow.
Vegetation present:	Grasses, clover, mimosa, plantain. Presence of clover and plantain indicate compaction of soil.

## Work Plan

Activities	Days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Rotor tilling soil	1	█																				
Design	4		█	█	█	█																
Earthworks	5						█	█	█	█	█											
Soil improvement	3											█	█	█								
Purchase plants	3														█	█	█					
Planting	3																	█	█	█		
Mulching	2																				█	█
<b>Total Days</b>	<b>20</b>																					

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## Goals Articulation

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- To create a forest garden to grow fruits and nuts where maintenance and external inputs are kept to a minimum;
- To provide fruits & nuts and other crops for consumption of the 34 residents of the orphanage;
- To demonstrate permaculture principles and techniques to residents and the local community.

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## Forest Garden

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- ⇒ High productivity by intercropping;
- ⇒ Biodiversity;
- ⇒ Self-sufficient eco-system;
- ⇒ Low maintenance;
- ⇒ Multiple *microclimates*;
- ⇒ Use of water harvesting.

The Garden of Ganesh is a place for fruit and nut trees placed in a way that nature can take its course and can maintain itself for as much as possible.

The area is located behind the kitchen area and girls dormitory. In relation to the centre of activities this area will be in Zone-3 of the Zone-planning. In length the field is going from north to the south and in this way we can make excellent use of the different sun positions. This area has a gentle slope. By preventing rainwater to just runoff from the area and causing soil erosion and loose essential *top soil*, *swales* are made. Runoff from the kitchen area is also diverted to these *swales*. The *swale*-system harvests rainwater and optimizes the use natural given water.

To speed up fertility of the soil a thin layer of *compost* is spread in parts where it is needed. Fragile parts, like *swale* mounts, and parts where it is needed most are *mulched* and here and there cow dung is spread. The presence of fungi in the *soil* is important for the growth of woody plants and trees. To increase these organisms trunks are dug in the soil.

At first nitrogen-fixing plants, like beans, peas and clover, (nitrogen is an element in chemical fertilizers but can also be obtained naturally) are grown together with other plants that create *biomass* or are beneficial in some way. All this is done to build *top soil*.

The vegetation after this soil building phase is placed within *guilds* to create more stable, stronger and self-sufficient eco-systems and to promote biodiversity so we keep on building *top soil*.

To protect the trees from strong winds, banana plants and napier grass is planted in between the swales. They function as windbreaks.

# Maps and Designs



Building

Upper Terrace

Small hill

Upper Terrace



**Garden of Ganesh**

Lower Terrace

Lower Terrace

**Garden of Ganesh**  
Hamro Gaun Eco-village, Sankhu, Nepal  
Forest Garden Project  
Base map  
April 2011  
Benjamin van Ooij

0 m  10 m

# Garden of Ganesh

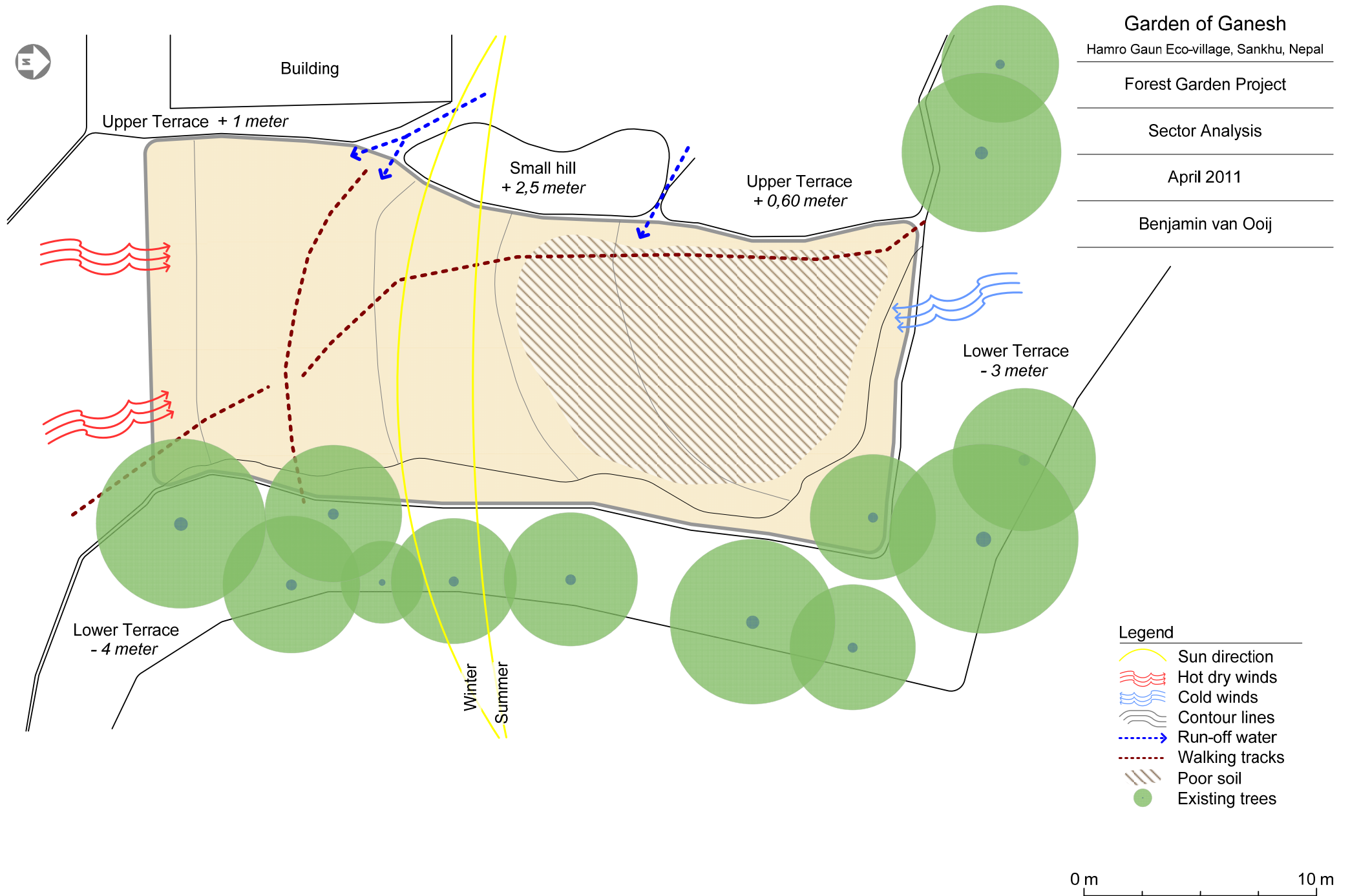
Hamro Gaun Eco-village, Sankhu, Nepal

## Forest Garden Project

Sector Analysis

April 2011

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# Garden of Ganesh

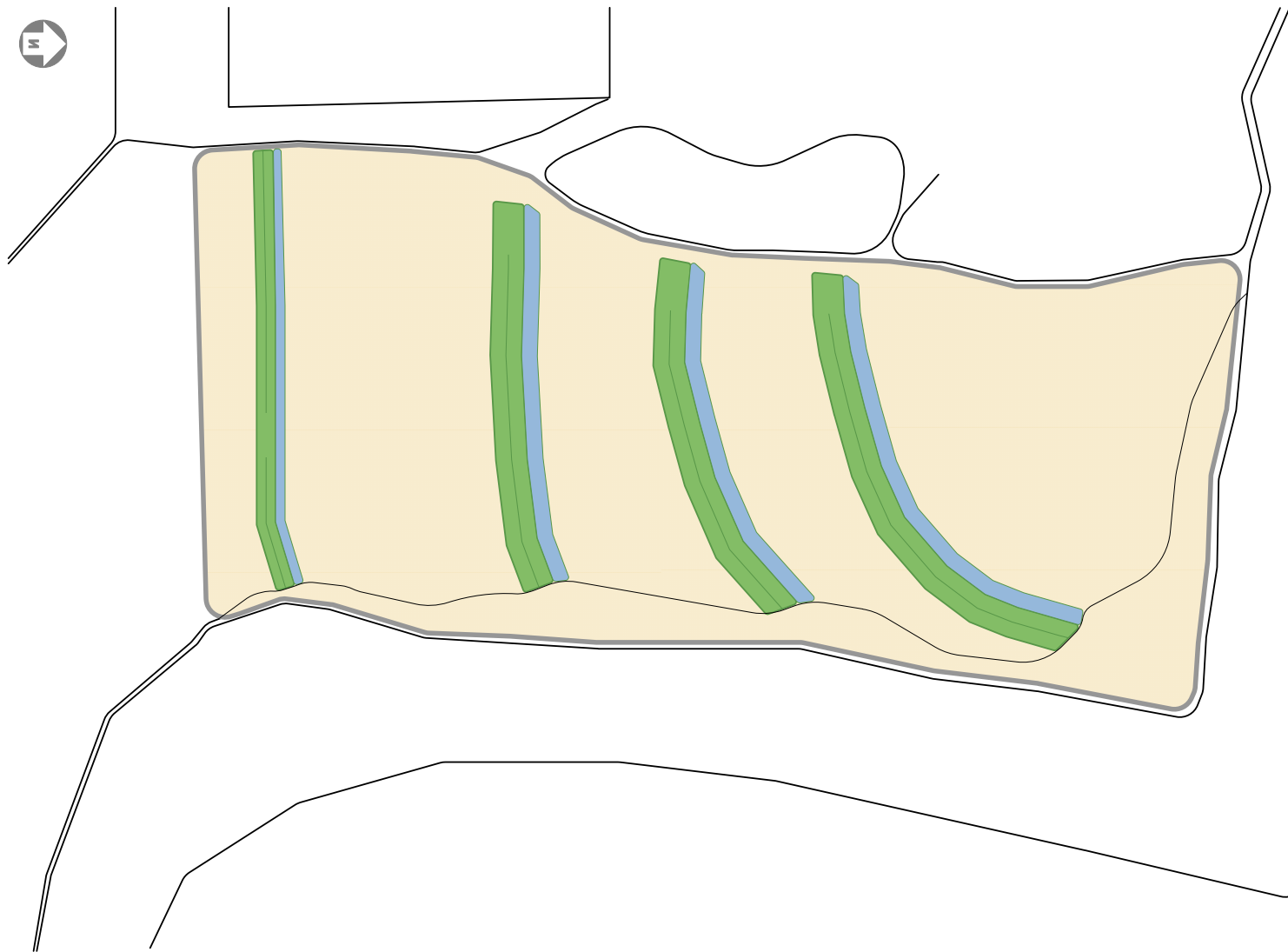
Hamro Gaun Eco-village, Sankhu, Nepal

Forest Garden Project

Swale-system

April 2011

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## Legend

 Swale

0 m  10 m

# Garden of Ganesh

Hamro Gaun Eco-village, Sankhu, Nepal

Forest Garden Project

Final Design

April 2011

Benjamin van Ooij



## Trees and major plants

1	Loquat	8	Lime
2	Fig	9	Banana
3	Walnut	10	Albizia Lebbeck
4	Avocado	11	Mango
5	Pomegranate	12	Frangapani
6	Orange	13	Jatropha
7	Pear	14	Napier Grass

## Legend

- Swale
- Pathway
- Tree
- Herbaceous plant

0 m 10 m

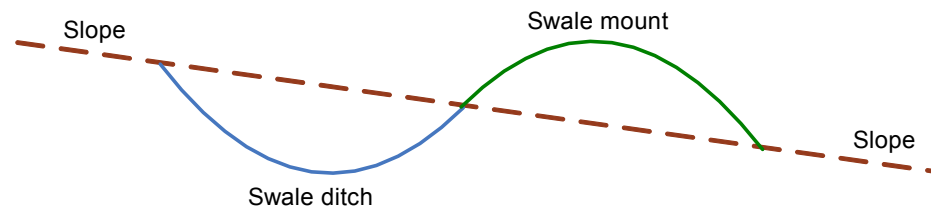


# Specifications

## Swale

- ⇒ Slows water runoff
- ⇒ Manages water flow
- ⇒ Creates *microclimates*
- ⇒ Creates fertility
- ⇒ Prevents erosion
- ⇒ Accelerates revegetation

A swale is a ditch on contour. With other words, it is a ditch following the slope on waterlevel. By doing this you will hold water from rain and/or runoff water. The mount (the dyke/wall) which is not compacted, unlike dam walls, slowly let's the water infiltrate the water downhill. See drawing below.



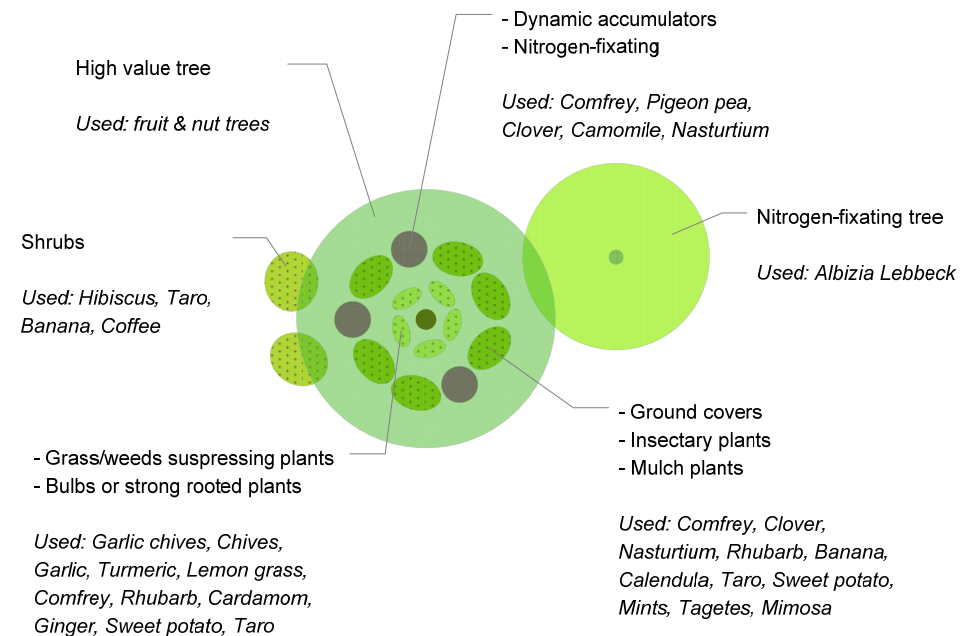
This way some of the water is held and slowly irrigated on the land below without any energy spend or any human interaction. With this you reduce the need of irrigation and increase fertility with more water present. Vegetation can be grown on different spots of the swale, which each have different conditions, multiple *microclimates* are created. When there is less runoff water, soil erosion will decrease and organic matter or silts that do get washed away by heavy rainfall will be caught in the swale and can be used later.

## Guild

- ⇒ Plants benefit each other
- ⇒ Stronger plants
- ⇒ Prevents pests and plagues
- ⇒ Self fertilizing
- ⇒ Attracts beneficial insects
- ⇒ More nutrients available
- ⇒ Less maintenance

All trees are placed in guilds which is a group of plants with each their different characteristics that benefit each other. See drawing below.

From down in the soil, different root systems, to up above ground, with different heights, everything works with each other. Some attract beneficial insects and some repel destructive insects. Some cover the ground or create shade and some bring nutrients up from deep underground. The chance of deceases and plagues will be reduced because you will have stronger plants. Another benefit is that the guild takes care of itself so you don't have to add fertilizers or do heavy maintenance.



## Plant list

Species	Type	Foliage	Yearly	Use	Edible parts
Loquat	Tree	Deciduous	Perennial	Fruit	Fruit
Fig	Tree	Deciduous	Perennial	Fruit	Fruit, leaves for tea
Avocado	Tree	Evergreen	Perennial	Fruit	Fruit
Walnut	Tree	Deciduous	Perennial	Nut	Seeds
Pear	Tree	Deciduous	Perennial	Fruit	Fruit
Pomegranate	Tree	Deciduous	Perennial	Fruit	Fruit
Orange	Tree	Deciduous	Perennial	Fruit	Fruit
Lime	Tree	Evergreen	Perennial	Fruit	Fruit
Mango	Tree	Deciduous	Perennial	Fruit	Fruit
Albizia Lebbeck	Tree	Evergreen	Perennial	Nitrogen fixing, fodder, mulch	
Frangipani	Tree	Deciduous	Perennial	Flower	
Coffee	Shrub	Evergreen	Perennial	Seeds	Seeds, fruit, leaves
Hibiscus	Shrub	Evergreen	Perennial	Flower, windbreak, mulch	Flower for tea
Pigeon pea	Shrub	Evergreen	Perennial	Nitrogen fixing, fodder	Seeds
Banana	Herbaceous	Evergreen	Perennial	Fruit, windbreak, mulch	Fruit, flower
Rhubarb	Herbaceous	Evergreen	Perennial	Vegetable	Stem, leaves
Sweet potato	Herbaceous	Evergreen	Perennial	Vegetable, groundcover	Root
Lemongrass	Herbaceous	Evergreen	Perennial	Herb, weed suppressing	Stem
Taro	Herbaceous	Evergreen	Perennial	Vegetable, mulch	Root, stem, leaves
Comfrey	Herbaceous	Evergreen	Perennial	Ground cover, pest control, mulch	
Napier grass	Grasses	Evergreen	Perennial	Windbreak, fodder, mulch	
Mimosa	Herbaceous	Evergreen	Perennial	Nitrogen fixing, ground cover	
White Clover	Herbaceous	Evergreen	Perennial	Nitrogen fixing, ground cover	
Aloe Vera	Succulent	Evergreen	Perennial	Medicinal	Leaves
Chamomile	Herbaceous	Evergreen	Perennial	Herb, flower	Leaves, stem, flower
Cardamom	Herbaceous	Evergreen	Perennial	Spice	Seeds
Ginger	Herbaceous	Evergreen	Perennial	Spice	Root
Garlic	Herbaceous		Perennial	Herb	Leaves, stems
Sweet potato	Herbaceous	Evergreen	Perennial	Vegetable, groundcover	Root
Diverse flowers, herbs, vegetables	Diverse	-	Annual	Groundcover, mulch, nitrogen fixing, pest control	Flowers, leaves, roots, stem, seeds