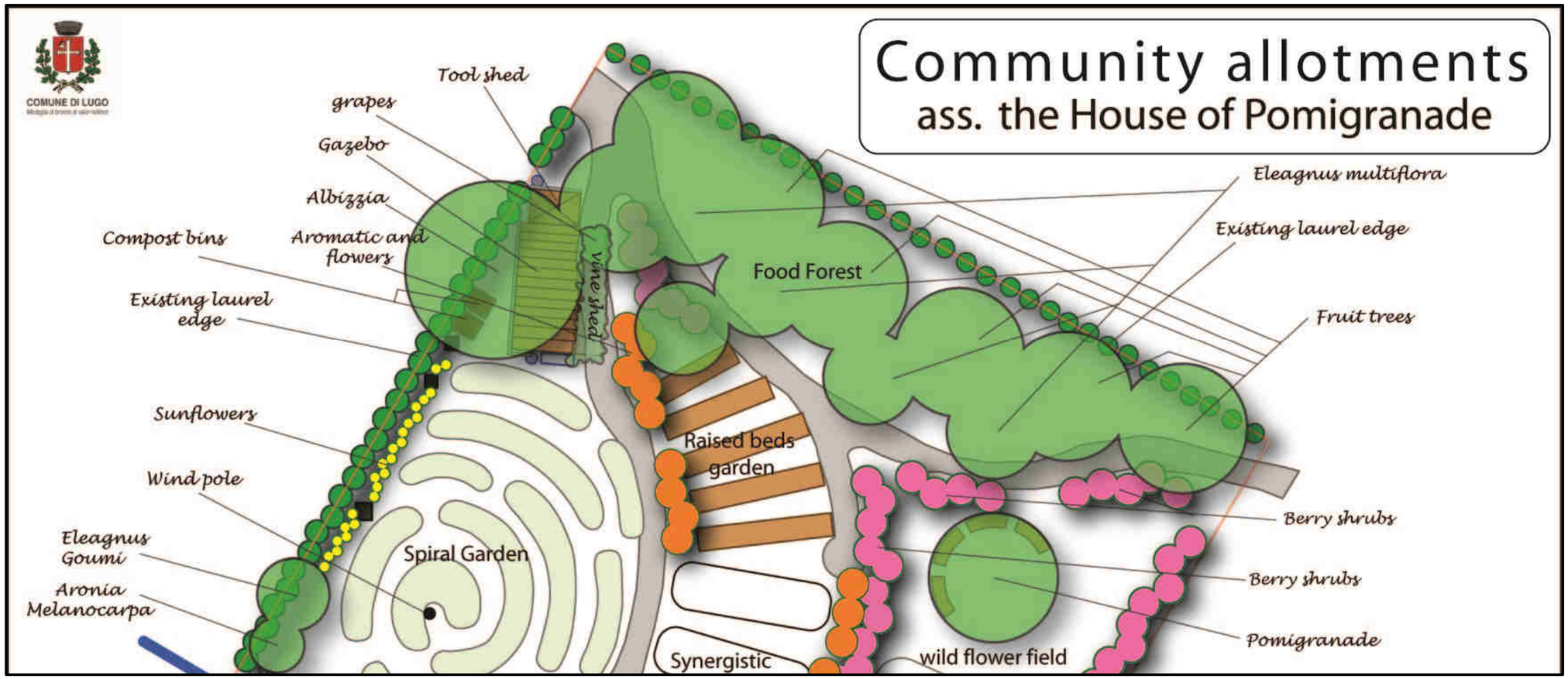
COMMUNITY GARDENS

Via Nievo – Lugo (RA)



Summary

I INTRODUCTION

This project was born from the desire of some friends to create a non-profit association for environmental educating through the creation and management of community organic gardens, educational and social activities and environmental education. The project design of the community garden was entrusted to me and I decided to design it by applying the ethics and principles of Permaculture, to have a project that would take care of the land, of the people and that would redistribute the surplus (garden products, experience and knowledge) to those who need it.

For this design I decided to apply the SADIMET (Survey, Analysis, Design, Implementation, Maintenance and Tweaking [adjustment]) framework.

I.1 ETHICS

EARTH CARE:

The land, property of the Lugo Municipality, will be cultivated organically, grown without use of chemical fertilizers or pesticides or fungicides. The soil will be enriched using the compost that will be produced in the garden and regenerated with the use of compost or Vermicompost tea.

PEOPLE CARE:

The members of the Association “the House of Pomigranade” will take care of their health by investing their time to cultivate vegetables, and by feeding themselves with products that will result from a regenerated and healthier land.

FAIR SHARE:

The garden products will be distributed to the people living in the neighborhood in the form of vegetables and fruits, but also in the form of food during events organized by the Association. The windbreak fence will also produce fruits and berries for the birdlife.

I.2 PERMACULTURE PRINCIPLES:

Observe and interact: For the relative position of the structures inside the garden we have observed both the sun orientation and the morphology of the ground, in particular a high precision GPS survey has been carried out in order to determine the water accumulation zones.

Catch and store energy: The simple fact of having a vegetable garden means to capture the sun's energy and store it in the form of vegetables. We will also create structures (gazebo and garden tool shed) for harvesting rain water for irrigation.

Obtain a yield: We will collect food (veggies, fruits and flowers) from the garden beds, from the food forest, from the berry edge and also from the windbreak edge.

Produce no waste: All the waste produced within the garden will remain on the garden beds or, together with the grass mowing and the rest of the organic material, will be put in the compost heaps to produce compost.

Design from pattern to details: to design the main paths I was inspired by patterns of the leaves of the trees, while for the arrangement of the raised garden beds by the radial patterns. The synergistic garden will have the form of a spiral.

Use small and slow solutions: for the realization of the garden we are making small steps at a time using almost 100% hand and muscle work.

Use the edges and value the marginal: one of the most interesting area of the field was the margin with the ditch in the West side. Along the old path of the ditch that has now been filled by the Municipality, will take place a multifunctional (windbreaks, nitrogen fixer, producer of berries and flowers and also a source of great biodiversity and shelter for birds, insects and even rodents) edge.

I.3 SUMMARY of TOOLS:

I.4 ACHIEVED OUTPUTS

- Creation of an Association that manage a community garden
- Creation of a community garden
- Creation of different kind of garden beds (raised, synergistic, food forest, huegelkultur, etc…)
- The garden could be a key point for the organization of events.

II SURVEY

II.1 MAP OF THE AREA:

Figure 1: Satellite image of the field in via Nievo – Lugo (RA).

Figure 2: Position of the field (pin) in respect to the position of the city of Lugo (RA) (in yellow).

BRIEF DESCRIPTION OF THE AREA

The field is located in the city of Lugo, province of Ravenna, outside the historic center, in the North West side of the city and it is accessible through the road Ippolito Nievo. The area that will be used as a vegetable garden is served by a small park located in the North-West side.

The area is surrounded by a small city park that overlooks via Nievo and two large areas devoted to Municipal Gardens. In the south-west side it borders with an abandoned field and a ditch.

The soil is clayly, with evident cracks (summer 2013), along both sides there is a laurel hedge with drip line irrigation, while the border with municipal gardens is marked with a concrete curb 20 cm high . Thee gardens are served by municipal irrigation system.

On land there are also four manholes, one of which on the SW side to collect water (source of mosquitoes) and three on the east side closed, probably containing electrical cables or water diversions.

II.2 CLIMATE

Altitude: less than 15 m (mean sea level)

Precipitations:

769.2 mm/year average 1960-1999;

546.4 mm/year average 2000-2010

Snow: normally between December and March, max snow 50 cm.

Late frost: they could occur between the 16th of March to the second half of April due to cold winds coming from the Balcans. The minimum temperatures are registered at dawn and the duration can be from a few hours (normally 1 or 2 after dawn) to a max of 10 hours in extreme situations.

Drought: strong from April to May, medium from May to July

Temperatures: Min -5° C, Max 35°C.

Winds: in winter from North-West, in Spring from North-East, in Summer from East and in Autumn from North and North-East. The field in protected from the cold winds coming from North and West because of some residential buildings that act perfectly as wind stopper. The wind coming from the South-East are a problem only during the summer because they can dry the soil and vegetables more quickly.

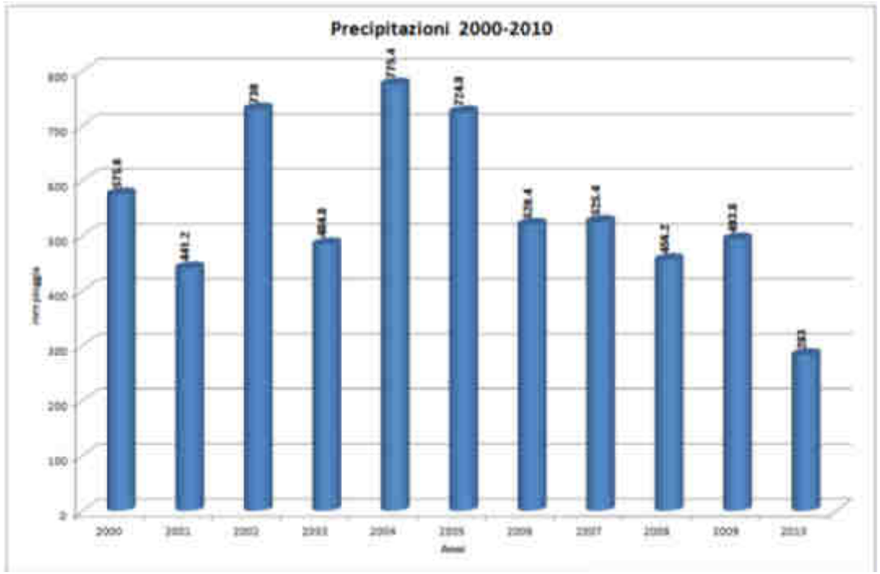


Figure 3: Precipitation in the last 10 years (2000-2010).

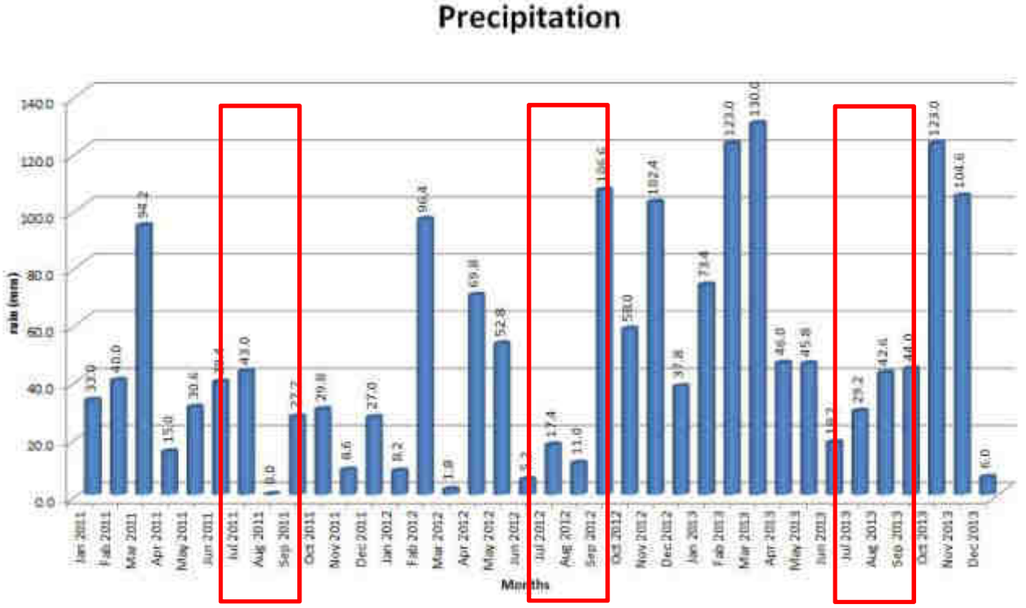


Figure 4: Monthly precipitation diagram for the last three years (2011, 2012 and 2013), the red boxes highline the three summer months

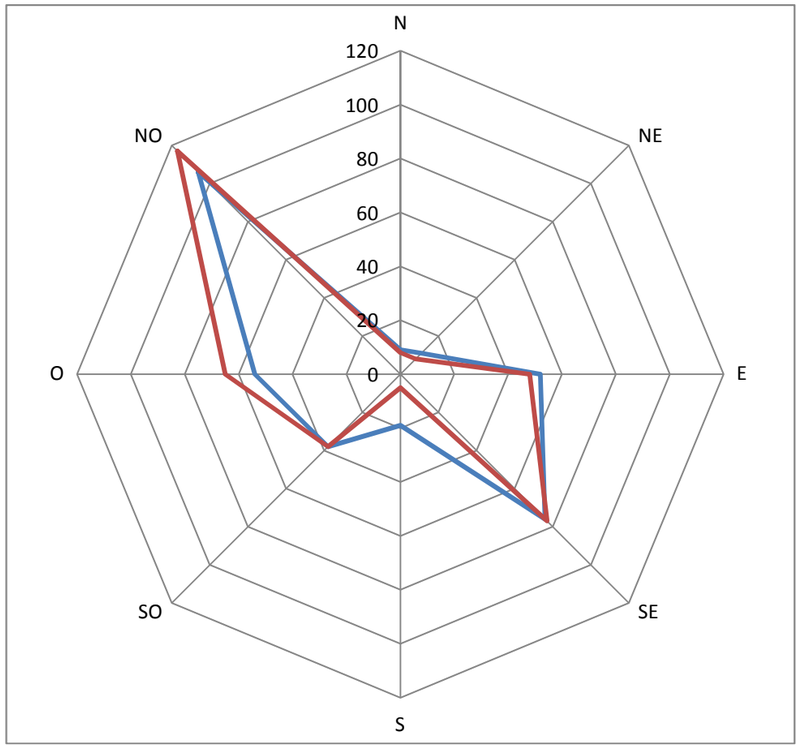


Figure 5: Direction and frequencies of the winds (red for 2013 and blue for the average 2000-2010)

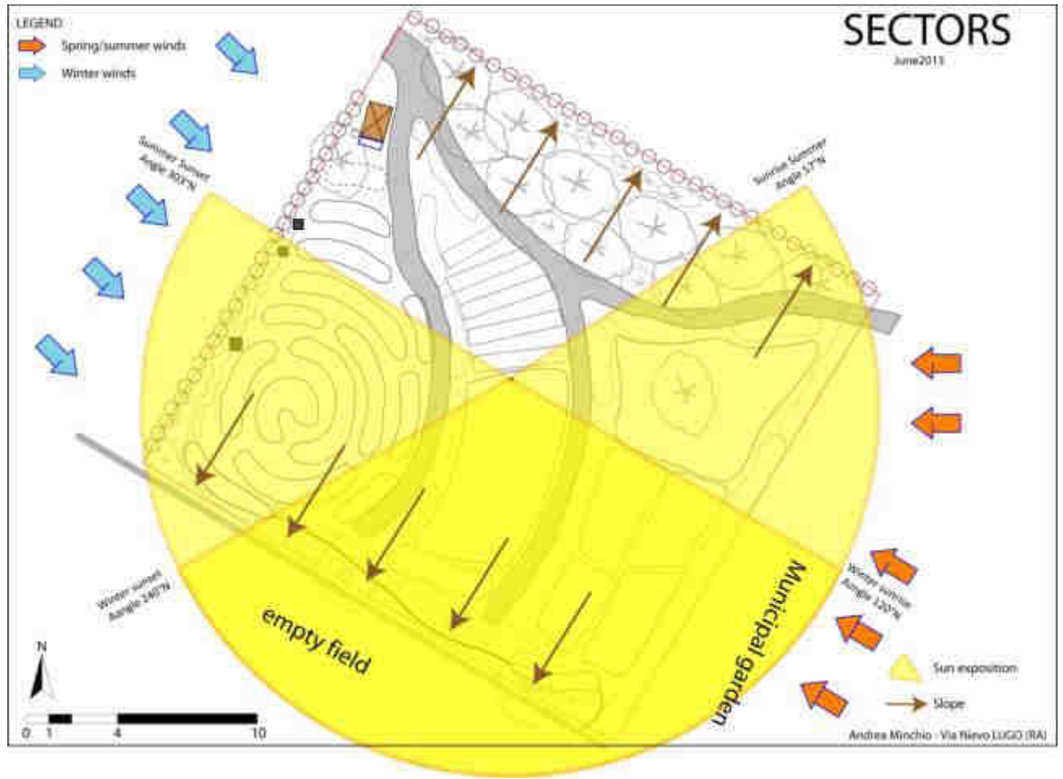


Figure 6: Sectors map.

In figure the blue arrows represent the cold winter winds, while in orange the spring/summer warm wind. The yellow areas represent the insolation areas (summer and winter time). The brown arrows represent the slope.

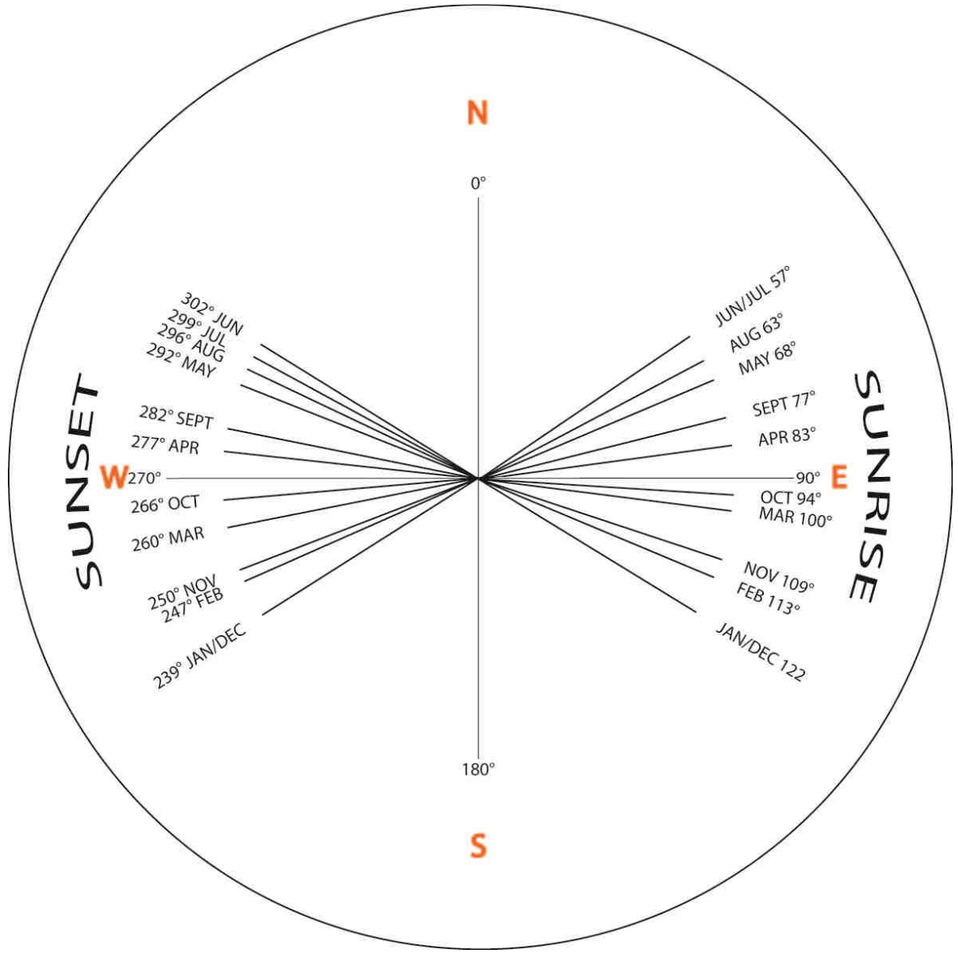


Figure 7: Angles of sunset and sunrise for the area.

II.3 CLIENT INTERVIEW

The client is represented by the association called "The House of Pomigranade" which consists of 12 members (June 2013). The interview has been attached to all the 12 members and below is a summary of their responses.

Name: Association “the House of Pomegranates”
Address: Lugo (RA)
Size of property: 900 sq.m.
Number of people in the property: 10-40
Groups who use the property: Students, friends, visitors from the neighborhood.
Consider physical disabilities: The idea is to open the garden lot for school visits and therefore some physical disabilities could occur.
Labour and skills: -
Client values: in the road of sustainability
Custom Food: Omnivore
Age: From 27 to 65.
Financial situation for construction design: very low money to invest in the project
Resources on the property: water supplied by the Municipality of Lugo, Lampposts on the west side outside the boundary of the area.
Type of property: Concession (owned by the Municipality of Lugo).
Restrictions on the use of the property: distances from the boundaries for planting trees and bushes.
Potential disasters: Snow and ice and strong wind from the West in summer time.
Maps: cadastral map, Google map / Bing
Level / type of products required: Shed for the garden tools and gazebo for socializing.
Measures for energy efficiency: yes
Confidentiality (views, neighbors, etc...) if possible
Priority for the property: Garden beds
Hydrographic situation (quality and quantity): Quality not available
Water in general: one given by the Municipality of Lugo and rainwater collected from the roofs of the structures (gazebo and shed).
Soil: clayly-silty, shows cracks and very light color. Absence of humus.
Erosion: not evident
Appearance: lawn prevalence of weeds.
Client wants: covered area, educational area; vegetable garden; fruit trees
Client needs: Healthy eating; gathering space / sharing; relax; a project that works.
Services: Shed for garden tools, small greenhouse for seedlings, rainwater tank, compost and gazebo.
Winds: North-West

The interview was conducted in early July 2013 via internet (e-mail).

II.4 LAND SURVEY:

A land survey has been carried out on the 11th of June 2013.

The ditch in the SW boundary.

View on the NW and NE boundaries. In the middle between the two laurel hedges there is the main access to the field

View on the NE and SW boundaries you can see part of the city park and part of the municipal garden.

View on the NE boundary from the secondary access. You can see the laurel hedge and some kaki trees..

View on the SE boundary. You can see the concrete curb.

A picture of the silty soil with cranks and grass.

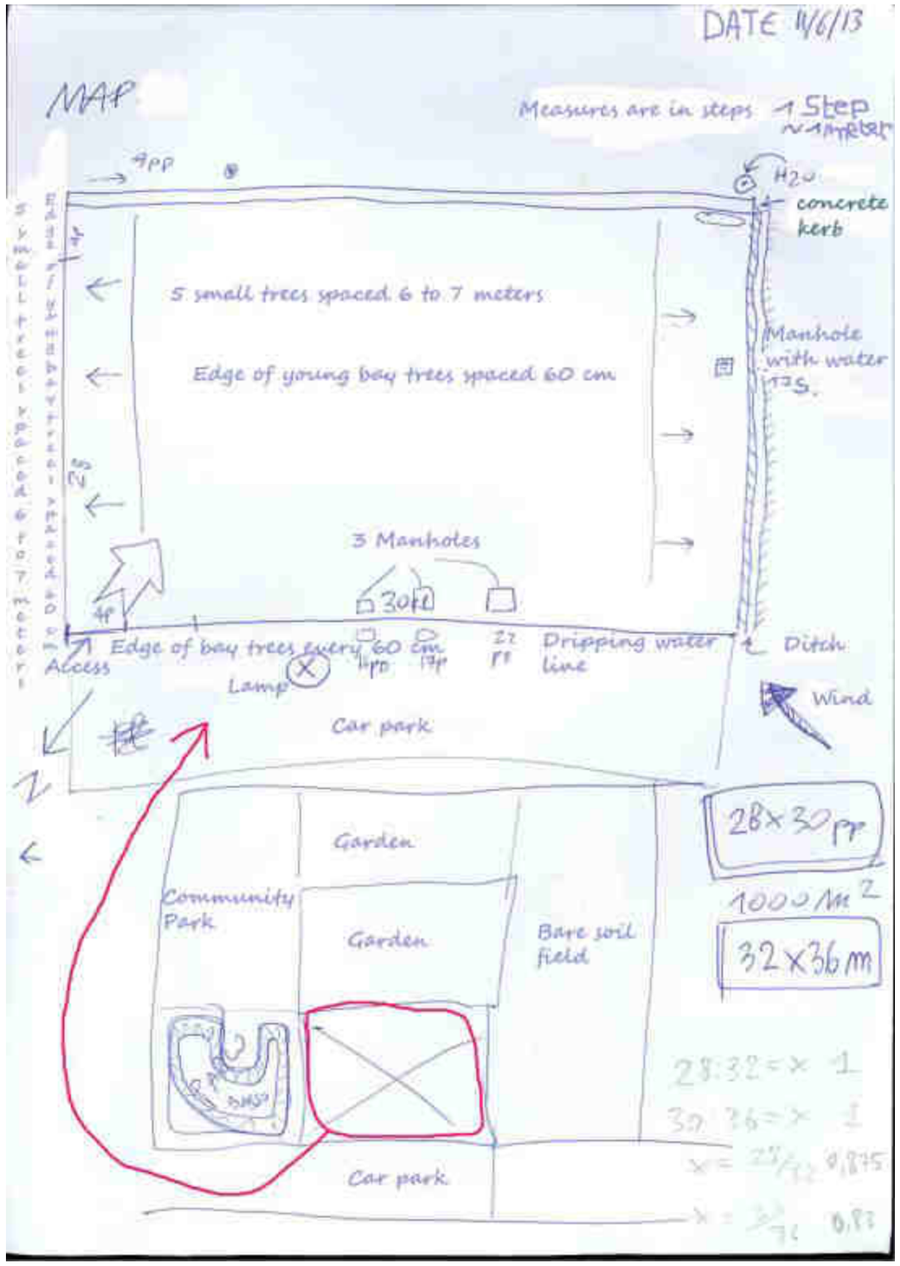


Figure 8: Draft survey map of the area.

A high precision GPS topographic survey has been carried out to evaluate the morphology of the land. You can see the map of the topographic points in Figure 10 while in Figure 11 there is the morphology map.

Figure 9: Map of the morphology points.

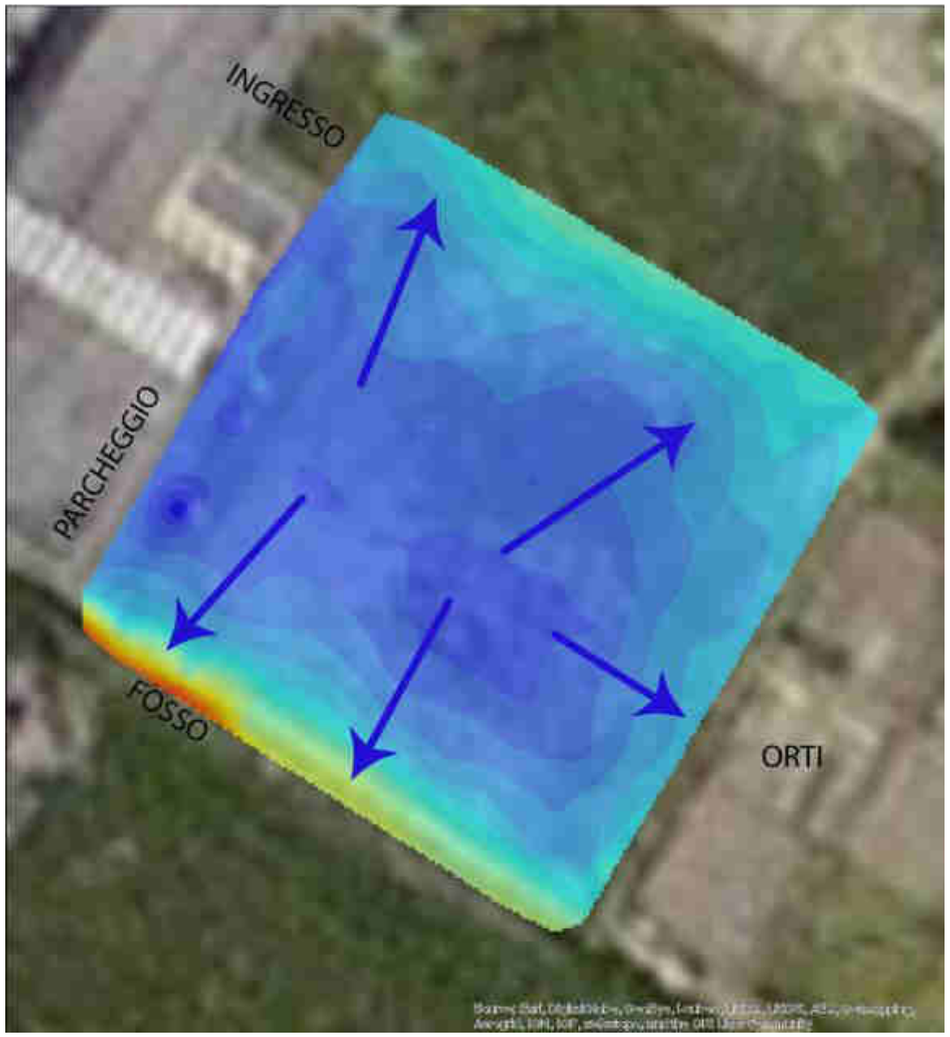


Figure 10: The morphology surface obtained by the analysis of the morphologic points. The dark blue are the higher areas while the reds are the lower. Arrow indicate the land slope.

II.5 LIMITING FACTORS

- Clay soil without humus with cracks and few diversity in the grass lawn; low soil fertility.
- Weeds
- Low budget
- Few hours/week to invest to the garden works
- Dogs and cats entering the garden.

II.6 MICROCLIMATE.

The most interesting margin is the one in the SW side where a ditch with natural vegetation and insects is the major source of biodiversity. Two laurel edges. A concrete kerb dividing the garden from the neighbor allotment.

II.7 P.A.S.T.E. (Plants, Animals, Structures, Tools and Events)

PLANTS	ANIMALS	STRUCTURES	TOOLS	EVENTS
Trees: 5 kaki.	Crickets.	4 manholes	Low budget.	School workshops.
Shurub: 2 Laurel hedge with plants planted 1 meter spaced	Dog traces.	Two young bay tree edges 60 cm spaced		Neighborhood workshops.
Climbers: Nothing.		A parking lot		
Plants: Some weeds and grass.		Lamps on the road (Ippolito Nievo)		
Runners: White clover.		Municipal Water		

III ANALYSIS

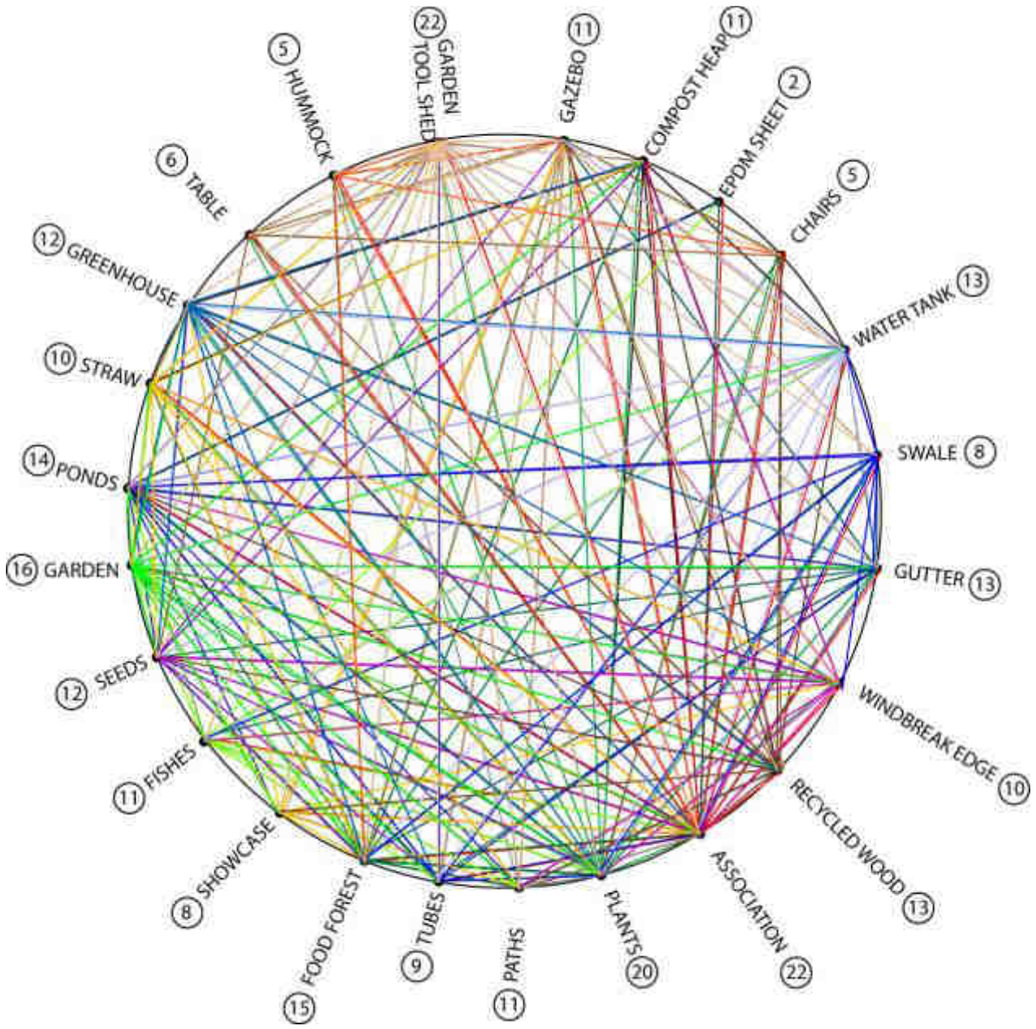
III.1 NEEDS, WANTS AND VALUES

NEEDS	WANTS	VALUES
Healthy food Integration/sharing space A project that has a good end Relax To educate Implementation of the Association projects Working outdoors	Gazebo Space for didactics Garden Trees Flowers Shed for garden tools	To become more sustainable :work with nature Association Psychophysical wellness Organic food Ecology

III.2 FUNCTIONS, SYSTEMS and ELEMENTS

FUNCTIONS	SYSTEMS	ELEMENTS
Relax	→Gazebo	→relax corner →chairs →beach chairs →hammock →recycled material
	→Food Forest, Windbreak edge	→trees, shrubs, plants, flowers →Mulch
	→Small ponds	→initial work →EPDM rubber sheet →plants and fishes
Healthy food production	→Garden beds	→seeds, plants and small greenhouse →earth, sand, compost and straw
	→Food Forest	→Trees →Shrubs, perennials →cover plants →Cardboard, straw, mulch
	→Wind break edge	→Trees, shrubs, berry shrubs, plants → Cardboard, straw, mulch
Aggregation/sharing	→Gazebo/Shed	→Wood →Gutter →Tubes →Climbing plants →Table and chairs
	→Planning	→Schedules →Organisation
Teaching	→Visite organizzate	→Garden, paths, area in common →Showcase → Association logo
	→Network	→Facebook →Friends →Mail
	→Neighbors	→Showcase →Association logo
Good project	→Planning	→Gantt project →Time tables
	→Garden tool shed	→Wood →gutter →Tubes

III.3 WEB of CONNECTION



NUMBER OF CONNECTIONS	ELEMENTS
22	Association Tools shed
20	Plantys
16	Garden
15	Food forest
14	Ponds
13	Water tank Gutter Recicled wood
12	Seeds Small greenhouse
11	Gazebo Compost bin Paths Fish
10	Wind break fence Straw
9	Tubes
8	Swale Showcase
6	Table
5	Ammocks Chairs/Benches
2	EPDM rubber sheet

III.4 INPUT-OUTPUT ANALYSIS

The systems that will be described are as follow:

I sistemi che vengono descritti e analizzati in seguito sono i seguenti:

- Spiral garden
- Raised beds garden
- Food Forest
- Wind break edge
- Ponds
- Tool shed
- Gazebo/Shed
- Paths

INPUT	SYSTEM	OUTPUT
Earth movement Irrigation system Straw Veggie plants Seeds Flowers Water Hedge Initial work Cultivator	SPIRAL GARDEN	Biodiversity Veggies Flowers Beauty Relax Food Fertility Straw Edges
Wooden boards Soil, sand, compost Veggie plants Seeds Flowers Water Hedge Initial work	RAISED BED GARDEN	Food Veggies Flowers Beauty Edges

Trees Shrubs Plants Bulbs Seeds Flowers Compost Cardboard Straw or mulch	FOOD FOREST	Food Fruits Flowers Relax Biodiversity Edges Veggies and perennials Microclimate Fertility Mulch Habitat for wildlife
Trees Shrubs Seeds Compost Cardboard Straw or mulch	WIND BREAK EDGE	Biodiversity Microclimate Edges Wind beacking Relax Habitat for wildlife Food Fruits Flowers for pollinators Straw
Earth works EPDM rubber sheet Fishes Plants Seeds Water Stones	POND	Biodiversity Microclimate Edges Food Relax Water Fishes Habitat for wildlife
Recicled wood Wooden boards Benches or chairs Table Gutter Vines Tank Sand Tyres	GAZEBO/SHED	Area in common Shade Reception Relax Water Vine support grapes
Municipality Scaffolding Seeds boxes Tool boxes Garden tool	TOOL SHED	Protection Space for Association logo Space for small greenhouse Water
Cardboards Debris Digging work Work machine	PATHS	Direction Order Edges
Green organic material Recycled pallets Shade Umidity Straw	COMPOST HEAP	Compost Heat Fertility Micro organisms

IV DESIGN

IV.1 ZONES

Zone 0 – orange in the map:

In this zone will take place the aggregation/sharing zone: the gazebo, the shed and the tool shed. In the gazebo the members of the Association will meet and decide al the work schedule for the gardens.

Zone 1 – blue in the map:

This is the zone of the gardens.

Zone 2 – yellow in the map:

This zone will be dedicated to the cultivation of annuals with low maintenance (potatoes, beans, cereals, etc…) but also a great flower filed.

Zone 3: - pink in the map

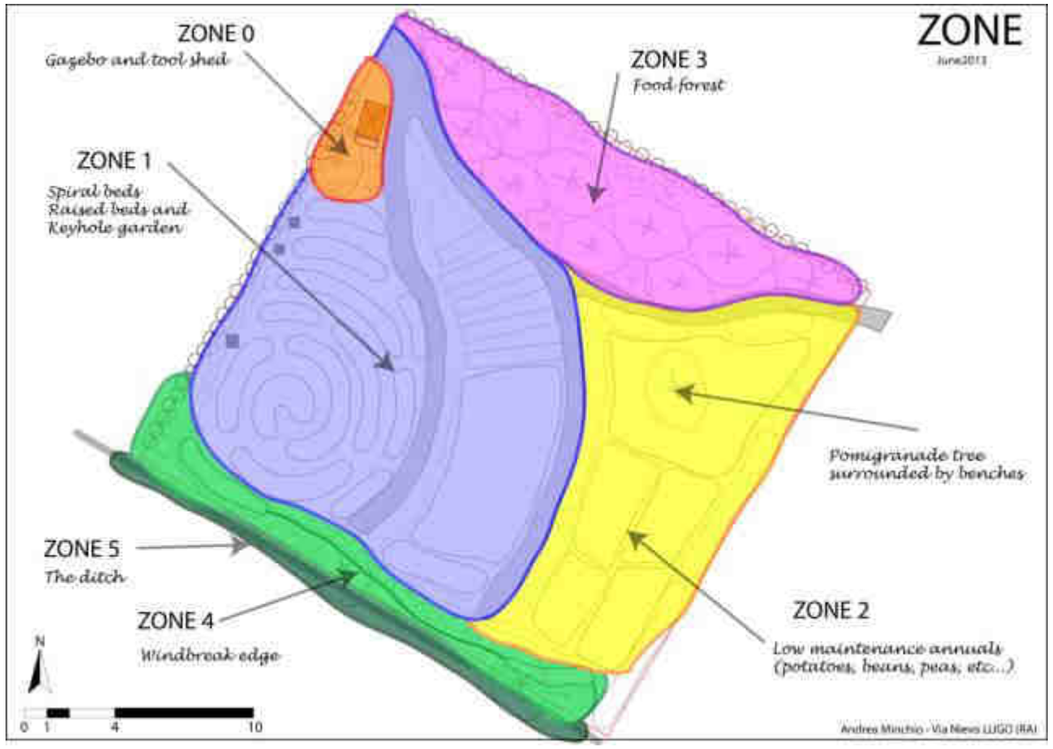
The zone three will be occupied by the food forest

Zone 4 – light green in the map

This will be the place for the ponds and the wind break fence

Zone 5 dark green in the map:

Occupied by the wild ditch



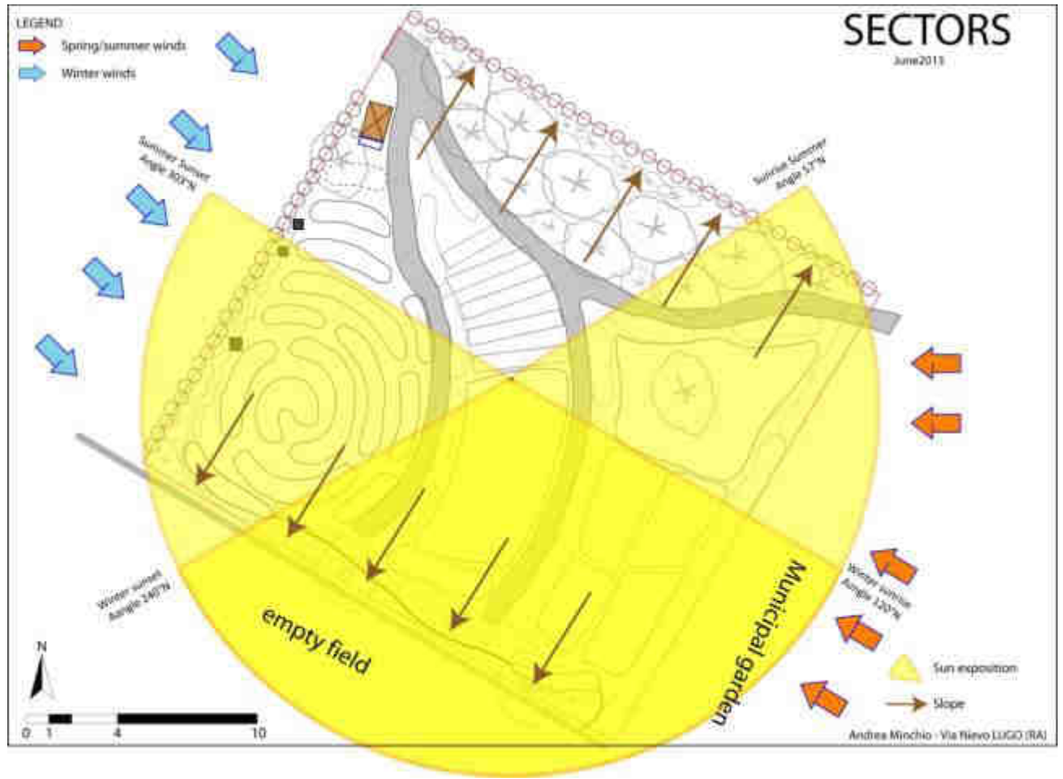


Figure 11: Sectors map.

In figure the blue arrows represent the cold winter winds, while in orange the spring/summer warm wind. The yellow areas represent the insolation areas (summer and winter time). The brown arrows represent the slope.

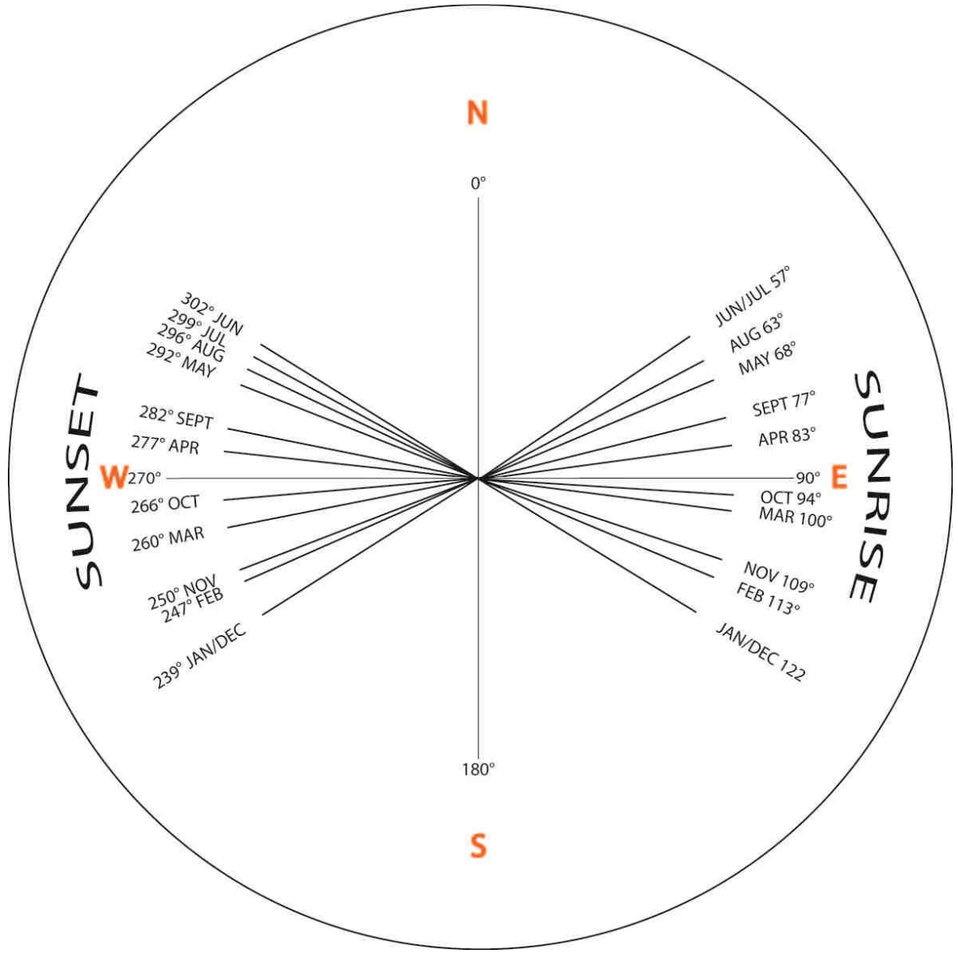
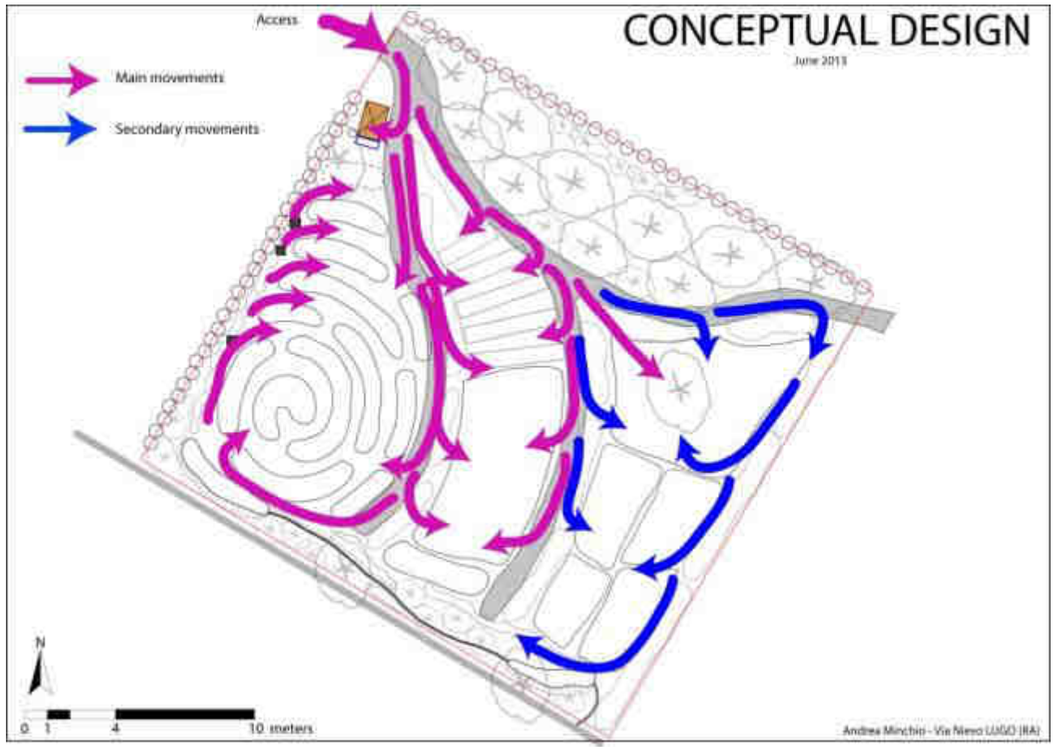


Figure 12: Angles of sunset and sunrise for the area.

IV.2 CONCEPTUAL DESIGN



This map represents the main and secondary fluxes(people walking) inside the property. Main movements within zone 0 and zone 1, secondary movements (blue) to reach and move inside the zone 2.

The main planned paths are three and will be created using long lasting materials and will permit people with physical problems to move freely inside the garden.

IV.3 MASTER PLAN

Three different type of garden have been designed for the Zone 1:

- A spiral bed garden with slightly elevated beds
- A radial raised bed garden using recycled wood for the beds
- A keyhole garden using recycled bricks

The zone 2 has been designed for annual crops (potatoes, beans, peas) or for medical plants. The core of the Zone 2 will be the Pomigranade tree with a circle of benches around for relaxing and talking. A field covered with flowers is also foreseen.

Zone 3 is for the food forest. 6 fruit trees will be planted together with N-Fixer shrubs and guilds plants.

Zone 4 will be for the windbreak edge


COMUNE DI LUGO
Community allotments
ass. the House of Pomigranade
Tool shed
grapes
Gazebo
Albizzia
Compost bins
Aromatic and flowers
Existing laurel edge
vine shed
Food Forest
Eleagnus multiflora
Existing laurel edge
Fruit trees
Sunflowers
Wind pole
Raised beds garden
Berry shrubs
Eleagnus Goumi
Aronia Melanocarpa
Spiral Garden
Berry shrubs
Pomigranade
Synergistic garden
wild flower field
Berry shrubs
Existing ditch
Topinambur and comfrey
Berry shrubs
Area for cereals, beans or potatoes
Hop or topinambur edge
Keyhole Garden
Aromatics and flowers
Berry shrubs
N
Sunflowers
Eleagnus x ebbingei
Tree sprigs
Eleagnus Umbellata
Eleagnus Multiflora
0 1 4 10
Andrea Minchio (a.minchio@gmail.com)

IV.4 COSTS

Main costs will be related to:

1. Gazebo
2. Tool shed
3. Fruit trees
4. Plants in general
5. Seeds and veggie plants

GAZEBO (zero)

The gazebo building costs will be covered by the sponsors

TOOL SHED (zero)

Tool shed will be donated by the Municipality of Lugo (RAVENNA)

FRUIT TREES (zero)

The fruit trees (6) will be donated by the Lions association

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BERRY SHRUBS (30 – 50 €)

At the beginning the Association will have to buy some plants but after a while they will be able to learn how to reproduce and multiply the berry plants

The shrubs will cost between 1 and 12 euros each and I can estimate that 20 plants at the beginning will be sufficient.

SEEEDS and VEGGIES

At the beginning it will be necessary to buy seeds and small veggie plant for the gardens, but after some years the associates will learn how to save the seeds and how to grow plants from seeds.

V IMPLEMENTATION

V.1 TIMELINE

I. With GPS mark the position of the main paths, the position of the fruit trees, the position of the windbreak trees

II. Creation of the paths using cardboards covered with different kind of material; sawdust will last for 3 to 5 years and after that time the sawdust should be used as mulch on the garden beds, straw will last for 2 to 3 years or solid material (waste material) will require very little maintenance.

III. Creation of the raised beds and spiral beds

IV. Fruit trees planting

Figure 13: Marking operation

Figure 14: Creation of paths and raised beds

Figure 15: Food forest and gardens in July 2014

Figure 16: Satellite images of the garden in 2011 and in 2014. The new shape of the garden is quite evident.

GUILDS WORKSHOP

On the **11th of October 2014** we have organised a workshop on guilds, association of beneficial plants under the fruit trees of the food forest. Many friends and visitors have come to learn about plants association bringing aromatics, flowers, shrubs and N-fixers plants to plant in the garden

Figure 17: Guilds workshop leaflet

Figure 18: Some pictures of the trees of the food forest.

On the **22nd of November 2014** we have organised a workshop on Hugelkultur beds. The two hugel beds have been realized using organic material coming from the associates home gardens and will host different kind of berry shrubs, aromatic plants and flowers.

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14 of February 2015

The area of the future circular garden is still covered with a mulching layer.

The area after the mulch layer has been removed. The soil under the mulch layer developer in a soft and rich soil with no plants at all. A worms activity was evident due to the presence of worm casts (not visible in the foto because after the removing of the mulching layer there has been a huge flood event that covered all the garden soil (and almost half of the city of Lugo) with water.

The berry shrubs have been planted and the beds have been mulched.

March 2015

This is a satellite image of the project taken on the 31 of March 2015. The mulching layer has been taken away (low left corner in the image) and the circular garden has been implemented. Also the 2 hugelkultur beds have been implemented and are visible in the right side of the image.

APRIL 2015

JUNE 2015

A photo of the circular garden planted with veggies and supports for climbing beans and tomatoes.

Mespilus germanica

Ancient pear

Ancient pear

2016

VI EVALUATION

The community garden is working since February 2014. Several works have been done to implement the design, in particular raised beds, garden beds, hugelkultur beds, and a small forest garden. The association has always been composed of a varying number of people from 10 to 15, but they use to spend only a few hours a week in the garden.

At the beginning of the project we all have assumed that a tools box or shed was necessary for having all the tools in and to have them ready on the site when necessary. The necessity of having a shed also came out from the web of connection tool which put it at the top of the rank for number of connections. The organization of the garden, the typology of gardening and cultivation demonstrate, on the other hand, that the shed was not necessary for having the tools inside; the people working in the garden in fact, only need small tool which can be carried easily by hand or in backpack while cycling to the allotments.

The type of framework used (SADIMET) has proved useful to analyze the existing situation and to have a structure to follow for the design, especially because this is my first design.

The phase of SURVEY has been useful in particular for the evaluation of this type of field and consequently on the type of cultivation method to recommend. Even the topographical study was important to understand how the water moves on the field in order to plan the shape and the position of the vegetable gardens beds.

I initially underestimated some information obtained during the INTERVIEW WITH THE CLIENT; in particular I underestimated the time the people of the Association could dedicate to the garden and therefore I planned to create all the garden beds at the same time. This was not possible and so we have decided to develop only a part of the garden beds and to wait some months before starting a new part of the garden.

As for the implementation phase, after the construction of raised beds we started to realize the spiral gardens beds, but given the time to devote to the project and given the time of year (late spring), we realized that it was not possible to proceed. To manage the situation we decided to cover the area (dedicated to the spiral vegetable garden) with a mulching fabric. This proved to be an inspired choice as it has allowed the group to focus on the existing veggie beds and Nature of turning the clay and hard soil into a soft mattress with no weeds.

The general design of the garden went well, even if it is not yet all realized. The garden is still in an initial phase even if three years have passed. Maybe the designed solution were a bit too much alternative for the people of the Association and needed some more competence.

I realized that the people of the association are not keen in doing courses for increasing their skills in doing gardening, food foresting or permaculture and even if we have organised several events related with gardening, soil, food forest, they are still not investing in the formation.

Time is still a limiting factor not for the management of the garden beds, but for the development of the garden (there are still some elements that are missing).

VII REFLECTION

POSITIVES

- Now there is a Community Garden almost in the center of Lugo.
- The garden is working and produce lots of vegetables and biodiversity.
- The soil is regenerating and the environment is getting better and better.
- Some events have been organised in the garden with lots of participants, workshops, music and technical sessions.

MINUSES

- The containers for the raised bed have been built using recycle material. After almost three years the recycled wood became rotten and they are now useless. It is better to invest in good and solid solution for building the containers, this to reduce further work in the future.

- The foreseen gazebo has not yet realised. This should be the meeting point and the point of reference for all the people working in the garden, there could be a table and benches or chairs to seat, for resting for relaxing and also for having a quick lunch or an aperitif all together. There could be a space for keeping the communal things (seeds, tools, lawnmower, etc..). The gazebo should also be used for inviting schools and visitors. We have tried to build it with recycling materials, but the municipality said that a certified one is mandatory, and the cost of the project slow down any implementation.

- The people of the associations did not invest resources in informing the people living around the gardens, in order to create a sense of community around it.

INTERESTING

- The garden could be used for organizing visits from the schools
- The garden is ideal for helping people in finding and growing a community sense

TIPS FOR BUILDING A COMMUNITY GARDEN

- Find a group of people sharing the same visions and goals;
- Find a piece of land easily accessible, with cars or bikes or whatever other kind of means of transportation;
- Design the garden after collecting needs and wants from all the participants;
- Find a place for a shed or similar for keeping community things;
- Create semi-permanent beds for cultivation and well defined path to walk on.
- Create a map of the garden and assign a name to all the area of the garden;
- Create a working plan and a maintenance plan for every named area in the garden;
- Assign specific roles within the group;