

# 2012

## ISoM Community Garden Landscaping Project



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## Contents

1. Background .....	3
1.1 Aims and Objectives.....	3
2. Landscaping Process .....	4
2.1 Phases.....	6
2.2 Phase 1 .....	6
2.2.1 Site Preparation.....	6
2.2.2 Drainage and Roof.....	8
2.2.3 Outlining Shape of Area.....	10
2.2.4 What to grow? .....	10
2.2.5 Ideas for wall by Art Room.....	13
2.2.6 Other garden amenities.....	14
2.3 Phase 2 .....	15
2.4 Phase 3 .....	15
3. Funding and Responsibilities.....	16
3.1 Developing a Budget .....	16
3.2 Funding.....	16
4. CONCLUSIONS .....	17
5. Appendix A .....	18
6. Appendix B .....	18
Bibliography .....	19

## 1. Background

School gardens have a number of different uses which can be both practical and educational. School gardens provide an environment in which students can learn to work with teachers and parents while growing plants and learning the relationship between people, plants and wildlife. The only limiting factor to the lessons that can be taught at the garden site is one's creativity. A school garden can be viewed as a special type of learning center.

In the case of the International School of Macaé (ISoM), the school garden and landscaping project is necessary for a number of reasons such as solving drainage issues, providing a proper grassed area for the children to play and beautifying the area within the school grounds.

The project is being opened to the children, volunteers (parents and ex-students), teachers, other school staff, and locals (such as women's clubs or community groups) who may be interested in garden and landscaping projects.

### 1.1 Aims and Objectives

The aims and objectives of this project include:

1. To manage the rainwater runoff and soil erosion problem in the rectangular area outside the music room, in an attempt to solve the drainage problems
2. To convert the muddy, water logged area into a field of grass so as to reduce flooding in times of rainfall and to reduce the amount of mud that is transported via the students into the tiled areas of the school and the classrooms.
3. To create a successful, sustainable garden using organic methods
4. To improve the school environment (trees/grass/walking paths/flowers, etc.) and beautification of the area to enhance the aesthetics of the school
5. To provide a beautiful natural outdoor environment for the students and teachers to play, learn, relax and enjoy with the vision that every child benefits from stimulating outdoor learning and play in their education.
6. To enable the students to connect with nature, be more active, be more engaged with their learning, develop their social skills and have fun.
7. For students to gain a respect for and an interest in their school environment
8. To bring together school, children, families and community in a common endeavor

## 2. Landscaping Process

It is recommended that the landscaping process be divided into three (3) separate phases. Each phase will have a budget and a list of things to do. During each phase the work area should be accessible and usable to students. Depending on the work that is being conducted, the entire area may not be accessible but a concerted effort should be made to allow students at least partial use of the area.

The area that is being considered for this landscaping project is the rectangular area within the boundaries of the music room, the girl's bathroom and Mr. Kay's classroom, as shown in the photo below.

*Figure 1: Photo showing the site under consideration for the project*



*Photo taken by: Ian Bigger, 9<sup>th</sup> Grade Student, ISoM*



*Figure 2: Project site from another view*



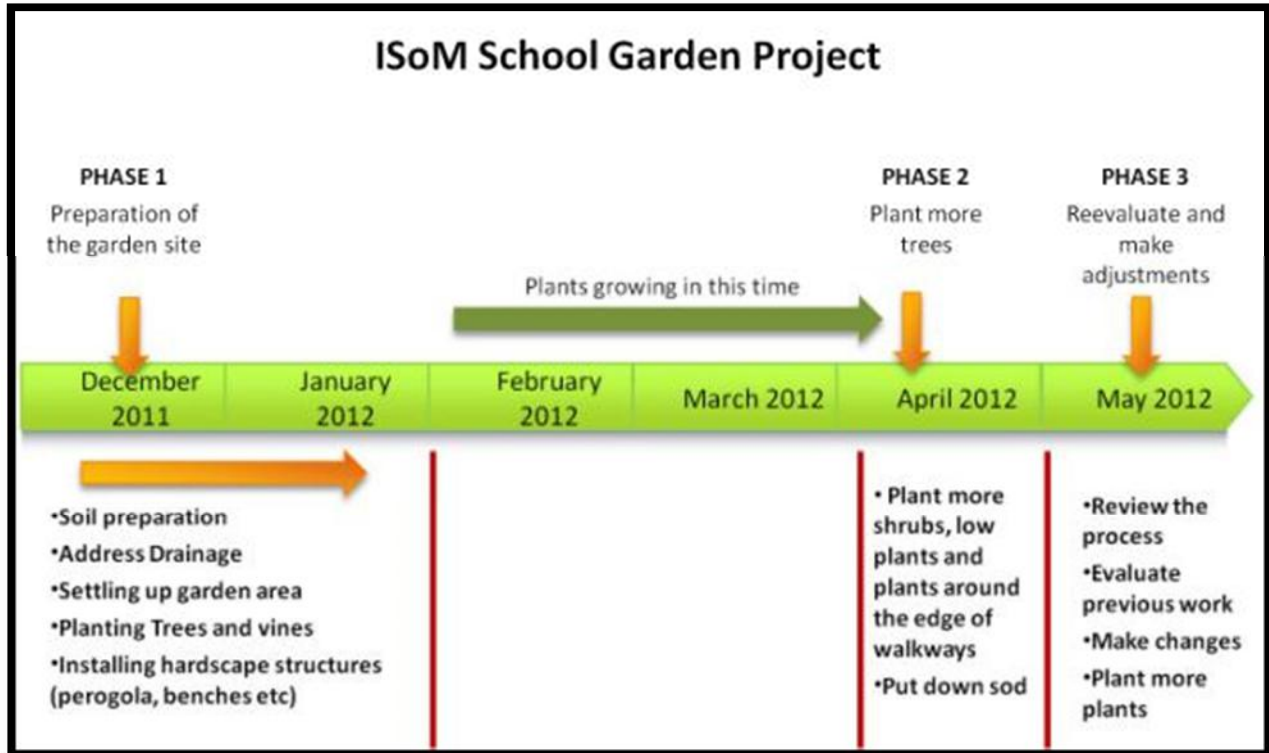
*Photo taken by: Ian Bigger, 9<sup>th</sup> Grade Student, ISoM*

General observations of the Site:

- 1) Soil is very compact and not suitable for vegetation
- 2) Needs plenty of organic matter
- 3) Soil needs aerating, drainage and humus
- 4) Terrain is relatively flat
- 5) Approximately 40% of the area is covered with grass but it is sparsely distributed throughout the site
- 6) There are two stoned pathways traversing the site
- 7) Site is prone to becoming waterlogged when it rains
- 8) Site collects rain water runoff from the roofs of the surrounding buildings without proper drainage for the water to leave the site
- 9) There is a play structure situated in the middle of the site
- 10) The perimeter of the site is covered with stone/tiled walkways
- 11) There is a hedge of trees to the west of the site

## 2.1 Phases

This project will be divided into three separate phases which will be outlined in detail below. An idea of the timeline and summary of works that would be completed are shown below.



## 2.2 Phase 1

This phase involves site preparation, drainage issues, outlining the shape of the area and deciding what to grow and other garden amenities and accessories. This phase should last about one month and should be completed during December 2011 to January 2012.

### 2.2.1 Site Preparation

At this point it should be decided what on the existing site that wants to be kept and what has to be completely removed. The play structure that is presently located at the centre of the site is to be removed and relocated to somewhere else on the school grounds. In addition, the diagonal stone path also has to be removed.

## **Soil preparation**

The grass and weeds that are presently on the site have to be removed. The soil needs to be dug up and sorted through to remove the small rocks and stones from it. In addition perennial grasses and weeds have to be removed. The ground should be leveled out. Organic matter will have to be added to the soil since it is presently heavy and not optimal for plant growth. A soil test can be done to determine the nutrients that are lacking. Mr. Kay's high school science students can probably do these soil tests as part of a class exercise. For instructions on doing a soil test refer to Appendix A attached to this document.

Please note the following:

1. *Acidity* If the soil is too acid, you will need to add lime; if it's not acid enough, add sawdust, composted leaves, wood chips or peat moss.
2. *Composition* (the proportions of sand, clay, silt and organic matter). Generally you will need to add more organic matter to help with drainage.
3. *Chemicals* If there is a lack of nitrogen, potassium or phosphate, these can be restored with natural fertilizers

We should try and consult someone in the community who is an expert in dealing with soil or maybe someone who works at a garden nursery or plant shop for advice and assistance.

## **Irrigation**

In the event that irrigation lines need to installed, this is the time for this to be done.

## **Hardscape**

In the event that sidewalks, raised beds, stone paths and general walkways have to be installed then plans should be drawn up and these structures put in place. If there are going to be any hedges, fences and walls, these should be established at this point (see section on Garden Amenities below for more ideas).

## **Tools, Equipment and Materials Needed for the garden itself**

- Shovels
- Spades
- Lawn Rake
- Wheelbarrow
- Hoes
- Watering cans
- Hose
- Multi-compartment re-useable plastic seed trays
- Trowels
- Buckets
- Pruning Shears
- Soil (organic matter, humus)
- Average grade soil
- Round river rocks
- Other rocks
- Bags of cement
- Piping for drainage
- Seeds, saplings, cuttings
- Wooden frames for crawlers
- Plants
- Natural Fertilizer
- Water

*\*\* Note – other items not included include tables, benches, bird house etc.*

## 2.2.2 Drainage and Roof

When it rains, the site becomes waterlogged and muddy. The rainwater from the rooftops flows directly into the site and something needs to be done to properly channel this water away from the site. The photos shown below illustrate what happens when it rains.







The above photos show the effects of rainfall on the site.

*All the above photos were taken by Ian Bigger, 9<sup>th</sup> Grade Student of ISO.*

### **Possible Drainage Solutions**

The drainage and flooding problems have been solved with the use of gutters that are designed to channel the rainwater to an underground rainwater reservoir system. For more details, please speak to Leslie Ann da Mota or Zoltan Raffai.

### 2.2.3 Outlining Shape of Area

Presently, on the site, everyone walks through the site using either the stone pathway or simply walking on the cross in all different directions. The desired shape of the area should be set up by forcing people to walk around the area rather than them walking across the site in a haphazard manner. Students and adults alike should be forced to use the proper walking paths and avoid stepping on the grass.

One suggestion to habituate people to the new use of the grounds is by building the “slant” and planting on it the heliconias, setting up the crawler frames and planting the crawlers. In addition, plant around the sinkholes so that no one walks on the edge of them.

\*\* See sketched design by Zoltan (Appendix B) which shows the intended layout for the community garden site.

### 2.2.4 What to grow?

When choosing what to grow, it is important to choose crops which are adapted to local conditions that match local traditions and are easy to cultivate and fit the school term. The general type of trees that should be considered include: shade trees, hedges, grasses or ground cover, ornamental plants, aromatic shrubs, evergreen bushes, herbs, and flowers.

Some of the recommendations made by Mr. Zoltan include:



**Erythrina Crista galli (Coral Trees)**



**Heliconia**





Heliconias collinsiana



Bromelias



Hibiscus



Sausage Tree (Kigelia Africana/Kigelia Pinnata)



Epidendrum radicans



Erythrina Ysistemom





**Bougainvillea**



**Mucuna Urens Tree**



**Mucuna urens seeds**



**Pau Brasil Abelha**



**Philodendrons**



**Spathoglottis Plicata**



**Pau Brasil**



**Wisteria Tree**

Other trees like bamboo can be looked at as an option as well as various herbs and vegetables that are native to Brasil. A trip to the local plant shop would be very good for getting ideas of the plants that can be grown in the community garden and the prices etc.

When buying the plants, it would be a good idea to get both saplings and developed plants as well which can minimize on the growth time and allow the garden to flourish earlier.

### **2.2.5 Ideas for wall by Art Room**

The wall that runs along the western border of the site (between the art room and the supply room) should be planted with creeper vines as shown in the photo below. These creeper or crawlers are otherwise known as “philodendrons” and “mucuna”. A pergola is supposed to also be located in front of this wall.



*Photo taken by Leandra Sebastien (2011)*



### 2.2.6 Other garden amenities

There are many additional items that can be added to the community garden for use by the students and teachers. Some garden amenities include:

1. Table, benches and rocks for sitting, eating and reading.
2. Grassy communal area for sitting, playing and outdoor lessons
3. Bird house which will encourage birds and can be a delight for the students of all ages
4. Pergola which is a garden feature that forms a shaded walkway or passageway or even a sitting area. It is made of vertical posts and pillars that support cross-beams and a sturdy open lattice. Vines are grown at the top of the pergola that provides some shade and cover from rain (See sketch by Mr. Zoltan for an idea of where the pergola should be constructed). Research will have to be done on this to know what materials will be needed, how to build etc. (see photo below).
5. Weather proof signs should be put throughout the garden, identifying the various plants which can be educational for the students. Painting of these signs can be done as an art project for the upper high school students.



## 2.3 Phase 2

After phase 1 has been completed, the site area should be left alone so that the plants can get settled and grow properly, for a period of approximately two to three months. After this time period, phase 2 can begin. This would be around April 2012 (refer to the timeline in Section 2.1).

It is anticipated that by this point, people would not be walking across the area but would have learnt to go around it.

The following can also be done in this phase:

- 1) Plant more shrubs like hibiscus and jasmine
- 2) Plant the low plants like: bromeliads, ground orchids, flowers etc.
- 3) Plant around the edge of the walkways (if the drainage solution is properly resolved)
- 4) Once shrubs are in place – put down sod. The area should be cordoned off for two to three (2-3) weeks to allow the sod to settle in.

The materials that are needed at this point include: the sod and relevant plants.

## 2.4 Phase 3

This third phase will be executed in May 2012. The following will be done during this phase:

- The process will be reviewed, the previous work evaluated and any changes and adjustments will be made at this point
- More trees can be planted such as – thin bamboo and dwarf banana
- At this point the crawlers on the pergolas have to be checked and attended to.
- The area where students will work and plant in the future have to be set up – such as flowerbeds, vegetable garden etc.

The materials needed for this phase include: plants

### 3. Funding and Responsibilities

For this project to be successful, it is critical that budgeting and funding be examined and worked out. A budget for this project can be done by either the members of the Community Garden Committee or by Leslie Ann da Mota and the relevant accounts personnel.

#### 3.1 Developing a Budget

The following items should be taken into consideration when developing the budget and securing the funding:

- 1) Site development and improvements – including water lines, Hardscape structures such as the pergolas, benches etc., and initial soil preparation including weed and grass removal, grading and tilling.
- 2) Equipment including items such as garden tools
- 3) Annual operating expenses which includes seeds, transplants, fertilizers and the water bill.
- 4) Curriculum and project materials which include educational and resource materials for teachers and youth and garden activity supplies (this is in the event that teachers decide to use the garden as an educational resource tool)
- 5) Miscellaneous – there are always things that may not have been considered... so brainstorming will help or allotting a certain amount for this item.

#### 3.2 Funding

Funds for this project may come from a variety of sources. Such sources include:

- 1) School – ISoM may fully fund the project or be able to assist with capital improvements, providing water and other expenses.
- 2) Parent Teacher Organizations – if one is established in ISoM – may be able to help purchase tools and supplies, as well as provide labor for the project
- 3) Service Organizations – in the community who support youth projects with monetary help and voluntary labor
- 4) Local businesses – can maybe donate plants, seeds, supplies, equipment rental or monetary gifts. You should be specific in your requests if you choose to go this route
- 5) School fund raising projects – ISoM can have school fund raising activities such as a school carnival, bake sale (cookies, brownies etc.) and other initiatives of this kind.
- 6) Personal donations – parents of the students may be willing to personally contribute to the endeavor

## 4. CONCLUSIONS

This document is meant to be used as a guide to the Community Garden Project. It is by no means, an extensive step by step document but more of an outline, guideline document that should be supplemented with additional research from online, books and within the community by speaking to experts in different field areas.

This project can be a really exciting, educational and fulfilling project for the International School of Macaé. Let's face it, our school grounds are presently not looking aesthetically beautiful and can use some sprucing up. Significant effort should be made by the administration, teachers, students and parents to get this project underway and to see it through. Come on! We can do it! It will be a great team building exercise and in the end we'll have a beautiful school garden that we can have classes in and relax on afternoons.

## 5. Appendix A

Source: Food and Agriculture Organization (2005), "Setting up and running a school garden – A Manual for Teachers, Parents and Communities", Rome

### Starting with soil *Children look closely at soil.*

**Objectives** Pupils learn to distinguish topsoil and subsoil, recognize good soil by feel and sight, and become aware of all the components of soil.

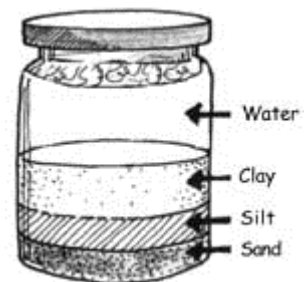
**Activities** In the school grounds pupils dig a hole to observe topsoil and subsoil, then inspect samples of good and poor soil, answer questions about them and learn the slogan "Good soil is damp, dark, crumbly and full of life". On sheets of paper they sort soil components into four sets: things from plants, things from animals, live things and "other", and learn to approve of organic content. They also do experiments to establish that soil contains air (put a soil sample in water), and water (cover a sample with a plate and leave in the sun).



### Soil quality *Simple experiments investigate soil quality and drainage.*

**Objectives** Pupils have a good understanding of soil structure and its importance.

**Activities** Students discuss which soil components contribute to: opening up the soil for air, water, roots; keeping the surface soft; providing essential food for plants; dissolving nutrients; holding soil in place; holding plants firm; allowing animals and bacteria to live; trapping water or helping it to drain. They identify the type of soil in the school garden (clay, silt, sand) by feel. Soil quality is tested by making a "mudshake" with soil and water and letting it stand for two days until the sand/silt/clay/organic matter settles out (ideal proportions are clay 4, silt 4, sand 2 and about 5 percent organic matter). They test drainage by digging a hole, filling it with water, letting it drain, filling it again and timing how fast it drains with a measuring stick (should be 6–10 cm per hour). Finally, they recognize that adding compost is the way to improve soil drainage.



## 6. Appendix B

See - (Sketch done by Zoltan)



## Bibliography

FAO (2005), "Setting up and running a school garden – A Manual for Teachers, Parents and Communities" Food and Agriculture Organization of the United Nations Rome

Evelyn Neier and Pamela Paulsen (2005), "Gardening with Kids" Kansas State University source <http://www.ksre.ksu.edu/library/hort2/mf2663.pdf>