

2010/11 Hong Chi - Hong Kong Jockey Club
Community Organic Farming Competition for Pri & Sec Schools in Hong Kong:
Community Organic Farming Workshop
2010/2011 匡智香港賽馬會全港中小學社區有機農耕比賽:
社區有機農耕推廣分享會
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Rooftop Urban Farming 天台的都市農耕



1911-2011

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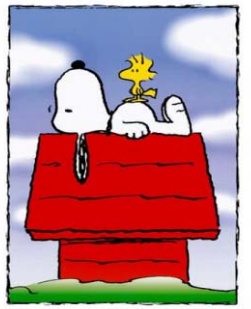
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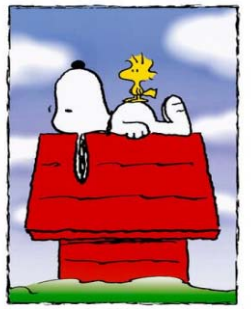


Why rooftop 為何在天台



- Urban cities 大都市
 - High density development 高密度發展
 - Lack of land and space 缺乏土地和空間
 - Some roof areas are unused 一些未使用的屋頂
- Potential 潛力
 - Better use of roof space 更好地利用屋頂空間
 - Improve urban greenery 提高城市綠化
 - Produce local food/vegetable 生產本地食品/蔬菜

Why rooftop 為何在天台



- Benefits of rooftop urban farming: 好處
 - Greening the rooftops 綠化屋頂
 - Produce vegetables/food 生產食品/蔬菜
 - Place for community functions 社區活動地方
 - More convenient to residents 更方便居民
 - Filter out air pollution 過濾空氣污染
 - Reduce air-conditioning load 降低空調負荷
 - Mitigate urban heat island 緩解城市熱島
 - Improve stormwater management 提高雨水管理

Rooftop urban farming in the world 世界上的屋頂都市耕種



Bangkok, Thailand (fruits, rice) 泰國曼谷 (水果, 米)



Tokyo, Japan (greenhouse) 日本東京 (溫室)



London, UK (with bee keeping) 英國倫敦 (含養蜂)



San Francisco, USA (kitchen) 美國舊金山 (廚房)

(Source: www.time.com)



Urban farming & education
都市耕種及教育



Horticultural therapy &
social functions
園藝療法和社區活動



How to do 怎樣做天台農耕

- Three key factors: 三個關鍵因素
 - 天時 (Climate)
 - Suitable climate/environment 適宜的氣候/環境
 - 地利 (Site)
 - Appropriate location 適當的位置
 - Site characteristics 位置特點
 - 人和 (People)
 - Manpower required 人手
 - Community/neighborhood support 社區 / 鄰舍支援



How to do 怎樣做天台農耕



- 1. Defining your project 定義你的項目
 - Describe intentions & expectations 意圖和期望
 - Social & community-based 社會及社區為基礎的
 - Educational 教育
 - Food produce & economics 食品生產與經濟
 - Environmental goals 環境目標
 - Horticultural experiment 園藝試驗
 - Personal pleasure & relaxing 個人的樂趣和輕鬆
 - Choose the scope & nature (temporary, permanent) 選擇的範圍及性質 (臨時，永久)

How to do 怎樣做天台農耕



- 1. Defining your project (cont'd) 項目定義
 - Select the type of garden 選擇花園的類型
 - Containers, open soil or others 箱，開放土壤或其他
 - Ornamental or edible plants 觀賞或食用的植物
 - Make a list of people involved 做一個人員名單
 - Design team & professionals 設計團隊及專業人士
 - Gardening: volunteers, residents, neighbours 園藝：志願者，居民，鄰居
 - Evaluate the resources 評估資源
 - Human, financial and material 人力，財力和物力

How to do 怎樣做天台農耕



- 2. Choosing the site 選擇地點
 - Loading capacity 承載能力
 - Weight of crops, equipment & people 作物，設備和人
 - Government regulations 政府規例
 - e.g. on height, railing 例如高度，欄杆
 - Sunlight and wind exposure 陽光與風
 - Access and safety 進入和安全
 - e.g. access to water, electricity 例如獲得水，電
 - Specific needs 特別的需要
 - e.g. elderly and handicaps 例如老年人或殘障人士

How to do 怎樣做天台農耕

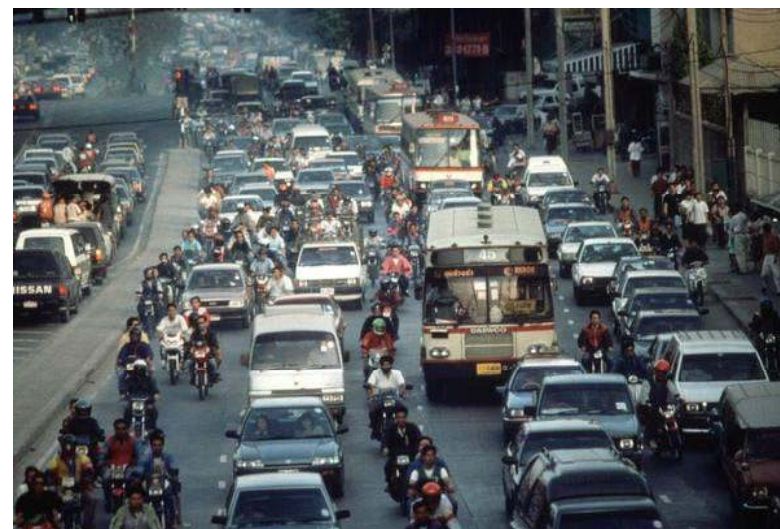


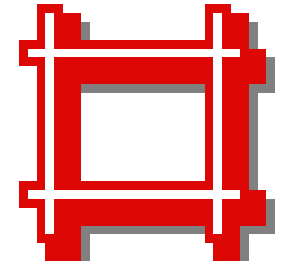
- 3. Designing the garden 花園的設計
 - Prepare the rooftop for setting up the garden 準備設立天台花園
 - Imagine and draw the garden 想像一下，並繪製
 - Build the infrastructure and lay out the garden 建設基礎設施和設計花園佈局
 - Coordinate the gardeners (manpower) 協調園丁(人力)

How to do 怎樣做天台農耕



- 4. Grow in order & eat well 生長秩序和吃好
 - Farm ecologically 生態農耕
 - Diversify edible plants 多樣化食用植物
 - Include medicinal herb plants 包括藥用草本植物
 - Understand the risks of urban pollution 了解城市污染的風險
 - Air pollution 空氣污染
 - Soil pollution 土壤污染
 - Water pollution 水污染

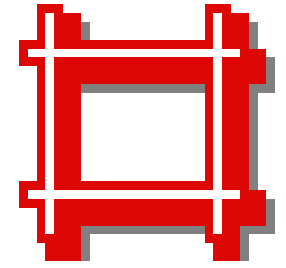




Design issues 設計因素

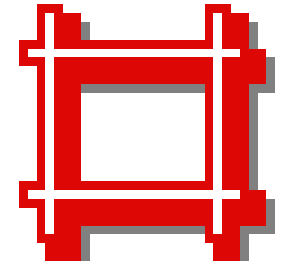
- Choosing plants 植物的選擇
 - Environment, space, availability, taste 環境，空間，可用性，味道
- Growing mix & compost 混合土及堆肥
 - Garden soil, potting soil, compost 茶園土壤，盆栽土壤，堆肥
- Fertilization 施肥
 - Organic, dry fertilizers, strips & soluble 有機，乾燥的肥料，帶材及可溶性
- Irrigation 灌溉
 - Water distribution, rainwater collection 配水，雨水收集

Design issues 設計因素



- Types of growing methods 種植方法
 - Containers 箱子/容器
 - Open soil 開放土
 - Hydroponic 水培
 - Greenhouse 溫室
 - Permaculture 樸門永續農業





Design issues 設計因素

- Growing in containers 在容器中生長
 - Movable and adaptable 可動和可適應
 - Usually more affordable 通常比較實惠
 - Small and large containers 小型和大型容器
- Open soil 開放土
 - Similar to ground level 類似地面
 - Usually with frames or boundaries 通常有框架或邊界

Urban farming on green roofs 綠化屋頂都市農耕



Farming on the roof



Vegetables and herbal plants



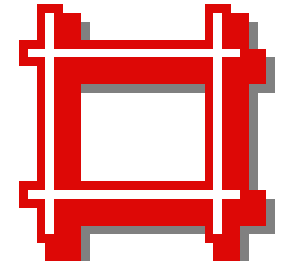
Water melon



Green beans

(Photos taken by Dr Sam C M Hui; Acknowledgement: St. Bonaventure Catholic Primary School)

Design issues 設計因素



- Hydroponic 水培

- Growing plants using mineral nutrient solutions, in water, without soil 植物生長使用礦質營養液，在水中，無土

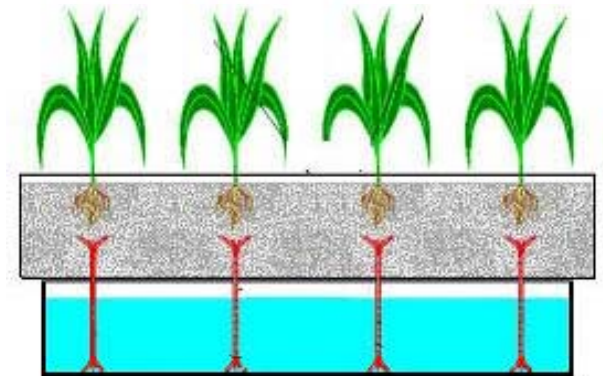


- Common techniques: 常用技術

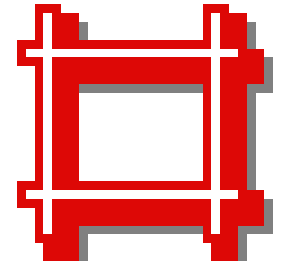
- Static solution 靜態方案
- Continuous-flow solution 連續流方案
- Aeroponic 空氣培

- Media 媒體:

- Expanded clay, rock wool, pozzolanic lassenite, coir 膨脹粘土，岩棉，火山灰lassenite，椰殼纖維



Design issues 設計因素



- Greenhouses 溫室



- Allow for year-round farming 允許全年農業
- Grow seedlings 幼苗生長
- Incubate special plants 孵育特殊的植物
- Can work with hydroponic systems 能與水培系統

- Permaculture (permanent agriculture) 永續農業

- A comprehensive approach to small-scale sustainable agriculture 一個全面的方法對小規模可持續農業發展



Practical examples 實用例子



- Container gardens in Taiwan 台灣種植箱
 - Modular boxes 模塊化箱
 - Can be set up D.I.Y. 可以自己動手設置
- Large containers 大型種植箱
 - For growing vegetables and fruits 種蔬菜和水果
 - Can be movable 可移動
- Window farms technique 窗口農場技術
- Sustainable rooftop farming 天台可持續農業

Container garden in Taiwan



(Source: <http://yiu.com.tw/green.htm>)

創造屋頂花園、菜園不必花大錢

休閒有機種植箱，獨特的DIY專利設計 可大可小、可高可低，並可自己動手組合成各種有層次的造形，及大大小小專屬的花圃、菜圃，也可加高兩層、三層種植絲瓜、葡萄、果樹等。

像積木般可隨意變化造形組合的栽種箱

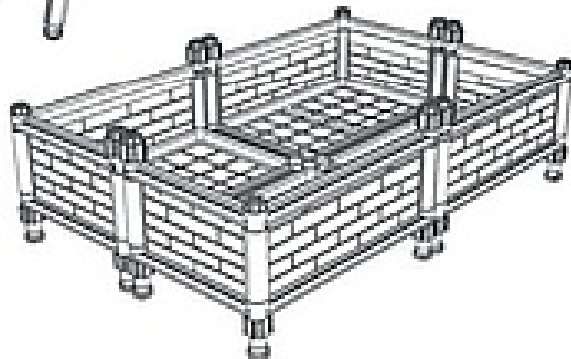
單層雙連通加高一節SD1

(長60cmx寬45cmx高35cm)



單層四連通SF

(長90cmx寬60cmx高25cm)



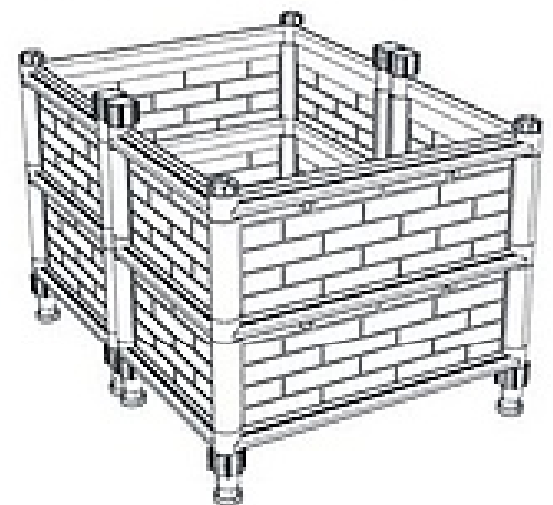
雙層箱DS

(長45cmx寬30cmx高43cm)



雙層雙連通箱DD

(長60cmx寬45cmx高43cm)



市民農園就在我家頂樓

不用防水、可隨意造景的種植箱

可搭一小型棚架、種植蕃茄、小黃瓜、等攀爬作物，也可加裝滑輪方便移動、清掃、搭配二箱、四箱、八箱防蟲網可防蟲防鳥，也可防雨淋。

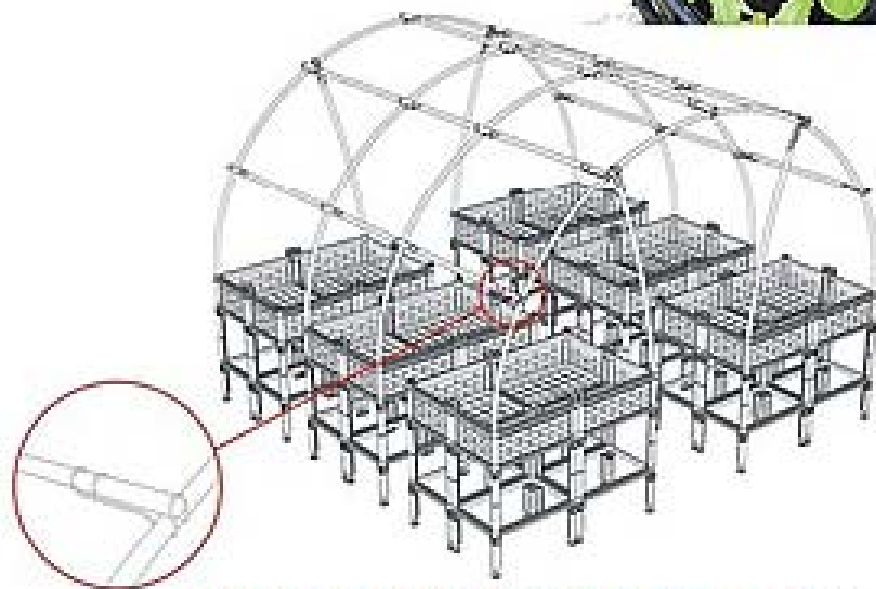
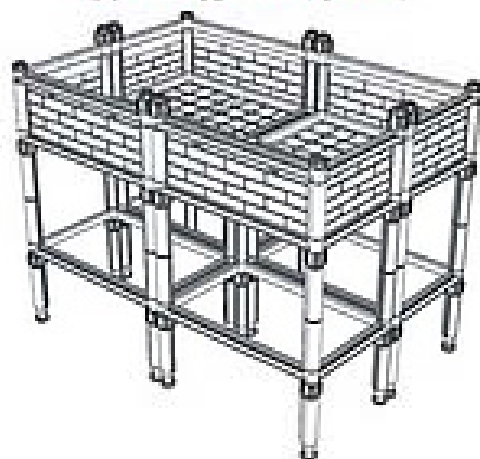


迷你溫室栽培組

種菜免彎腰，方便管理種植，年長者也能簡單種菜

單層四連通加高三節(種菜免彎腰) SF3K

(長90cmx寬60cmx高65cm)



使用彈簧扣夾固定水管

(Source: <http://yiu.com.tw/green.htm>)

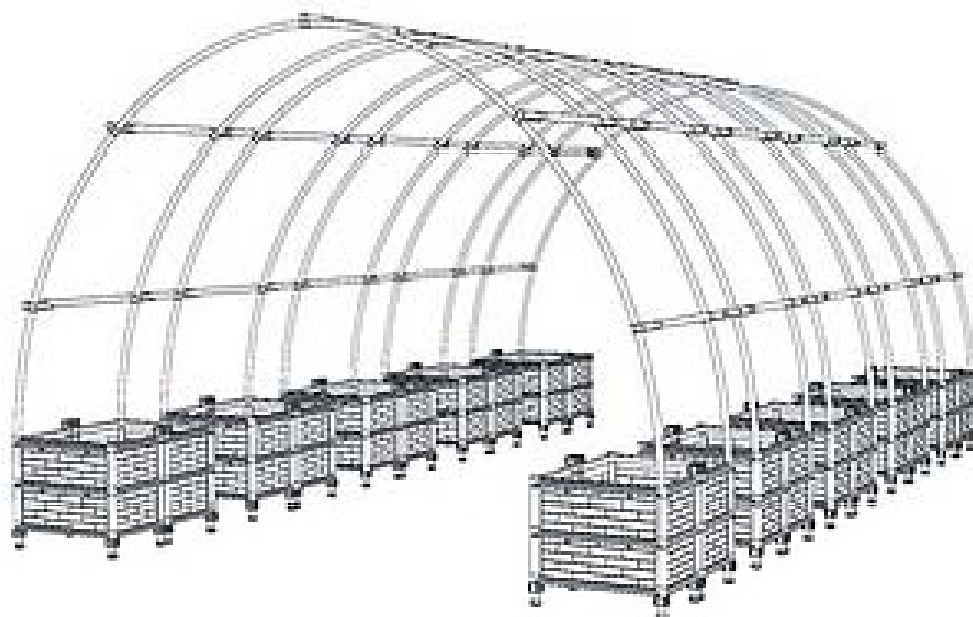
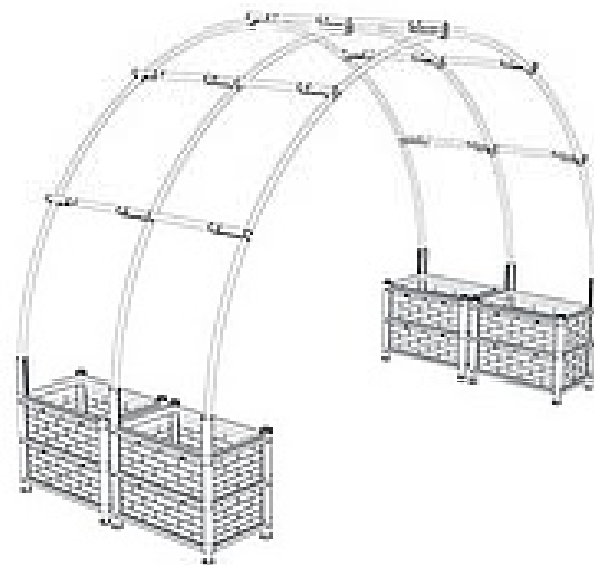
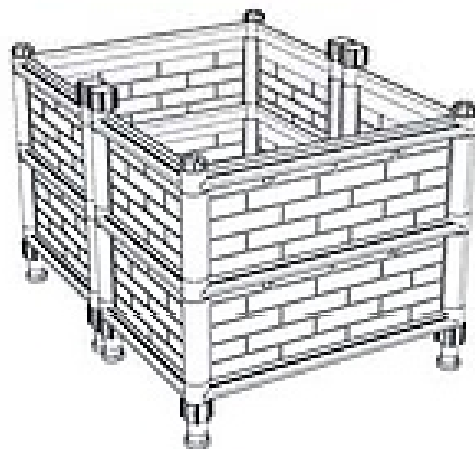


綠色隧道棚架栽培組

兩個箱子即可搭一棚架，無限延伸成為一綠色隧道

雙層雙連通箱DD

(長60cmx寬45cmx高43cm)



(Source: <http://yiu.com.tw/green.htm>)

Example of large containers for growing vegetables



Example of movable containers (strawberry barrels)

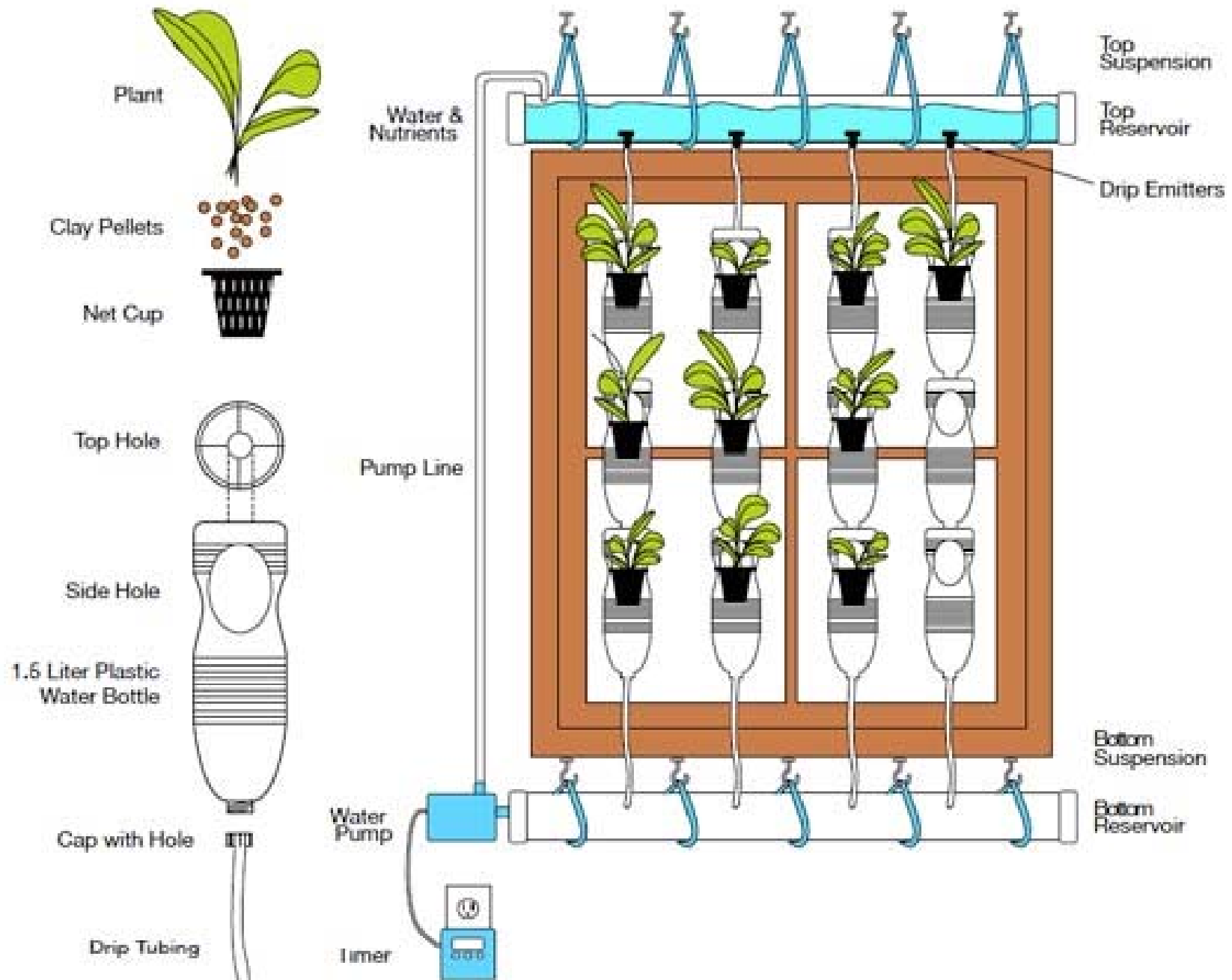


Window Farms Technique 窗口農耕技術

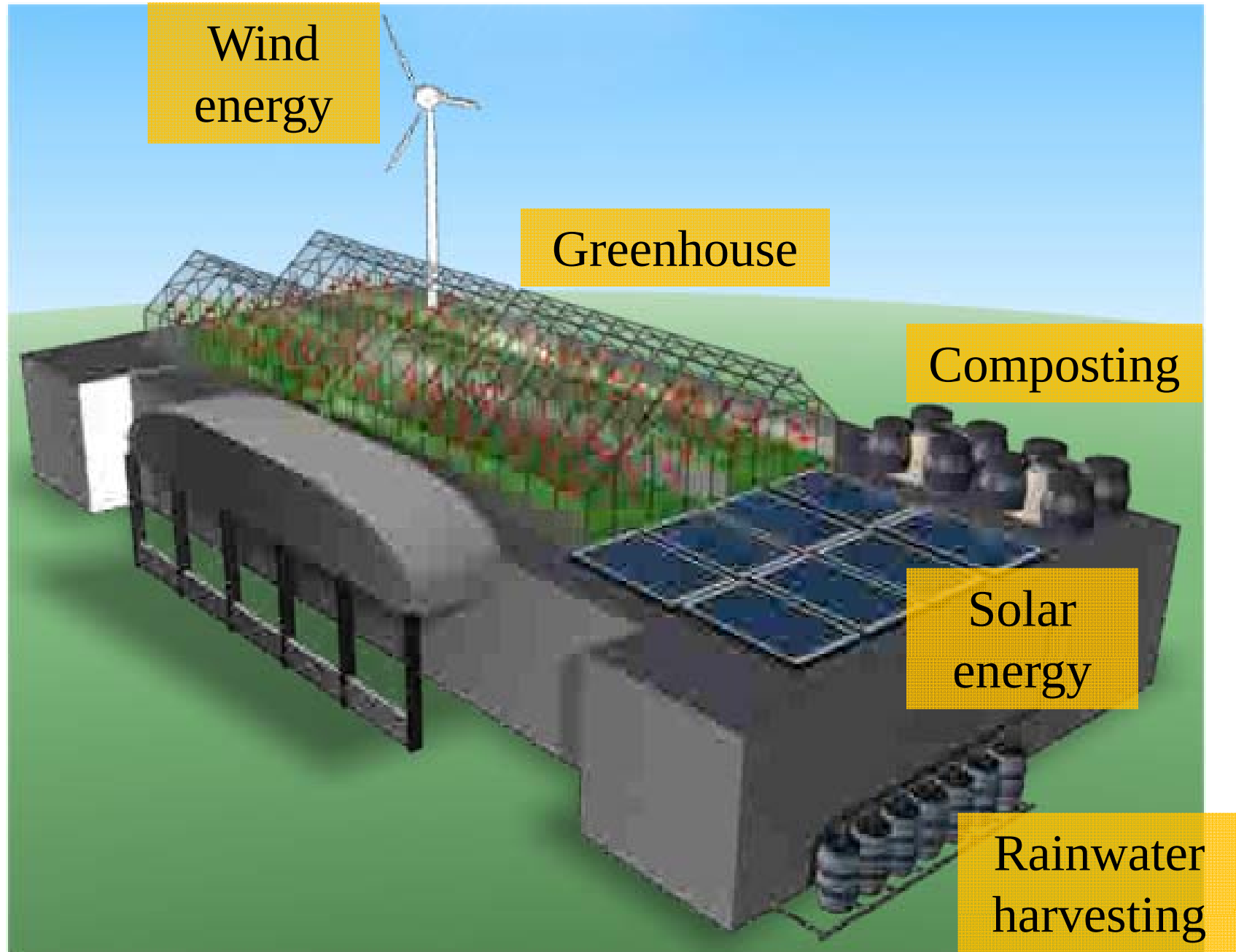


(Source: www.windowfarms.org)

Window Farms Technique 窗口農耕技術



Sustainable rooftop farming 可持續的天台農耕



THANK YOU 謝謝 !!



(More information: www.hku.hk/bse/greenroof/)