

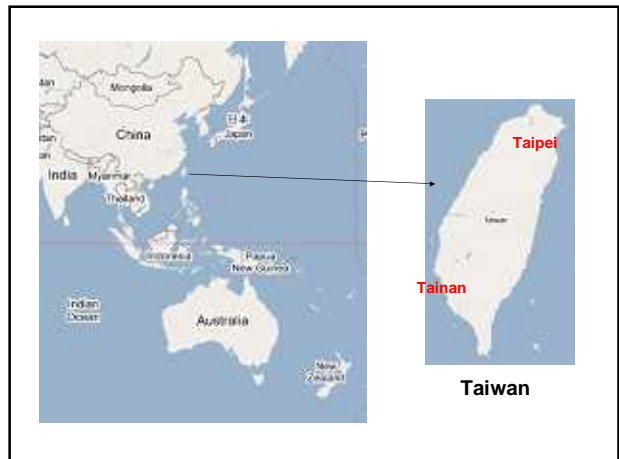
Challenge 2008 Taiwan National Development Plan

2008 Sustainable Campus

## Sustainable Campus in Taiwan

A movement from 「HEART」  
A march toward a [sustainable Taiwan]

H. Jenny Su, ScD  
Professor of Environmental Health Sciences  
National Cheng Kung University, Tainan, Taiwan  
Council Member  
National Council for Sustainable Development

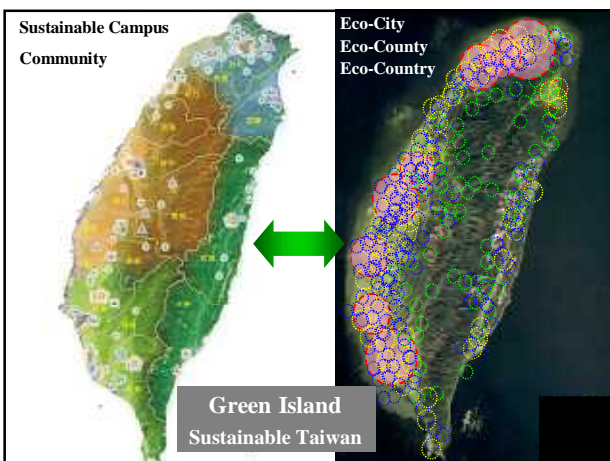
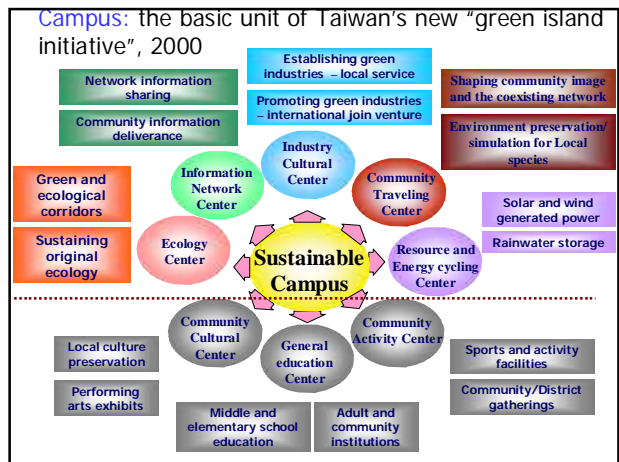


2008 Sustainable Campus

A reflection from "Earthquake 921", 1999

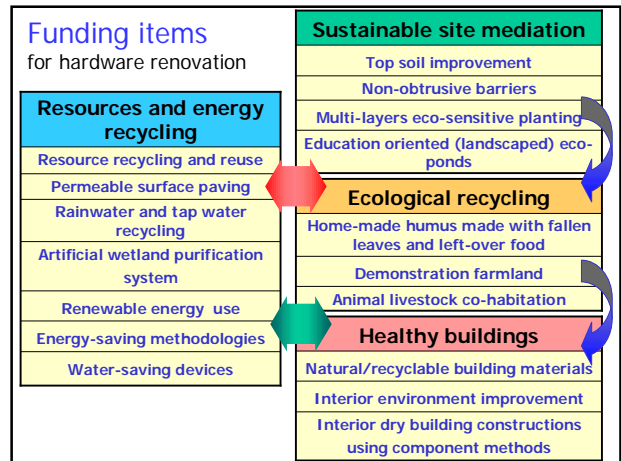
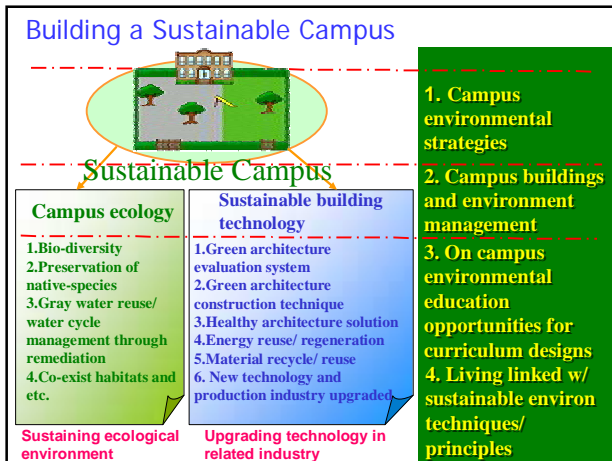
- Campus as a rescue center?
- Safety
- Community
- Education
- Ecology

1999.09.21 Executive Secretary for Environmental Protection and Education, Ministry of Education, TAIWAN



2008 Sustainable Campus

## Execution and Supervision



**Resources and energy recycling**  
Renewable energy use

**Resources and energy recycling**  
Energy-saving approaches

屋頂隔熱處理

**Site remediation**  
Top soil re-plantation

**Sustainable site mediation**  
Non-obtrusive barriers

**Sustainable site mediation**  
Multi-layers eco-sensitive planting

**Sustainable site mediation**  
Education-oriented (landscaped) eco-ponds

**Ecological recycling**  
Compost with fallen leaves and left-over food

**Ecological recycling**  
Teaching gardens

**Ecological recycling**  
Animal livestock co-habitation

**Healthy buildings**  
Natural/recyclable building materials

Indoor environmental quality improvement

Recycled and healthy materials used inside of an elementary school in east coast of Taiwan

The MOE formed a “**Technical Committee for Sustainable Campus**” to review operational progress and to advise appropriate strategies.

**Workshops and Visits by International Experts**

2008 Sustainable Campus

## Current Accomplishment

In the year 2002, 23 schools were funded out of 76 proposals, and the number of competing proposals increased to 564 in 2004, almost 16.8 % of all elementary and secondary schools in Taiwan.

### Cases in year 2002

District	Number of campus
Northern	7
Central	6
Southern	8
Eastern	2
Total	23

### Cases in year 2003

District	Number of campus
Northern	45
Central	29
Southern	36
Eastern	9
Total	119

### Cases in year 2004

Total Number of campus : 93

94年度：467所（包括92個整合案以及169個個別案）提出申請案。

### Cases in year 2005

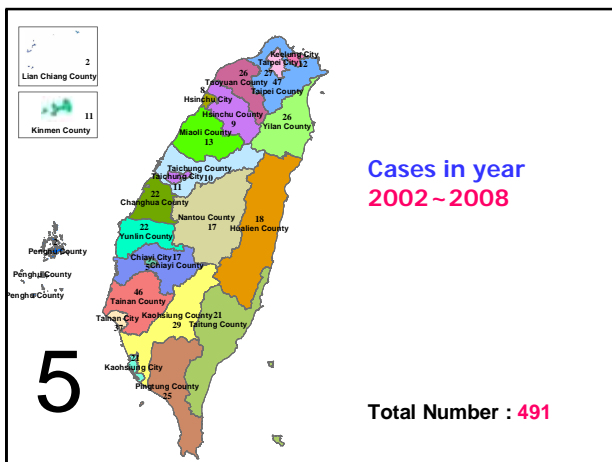
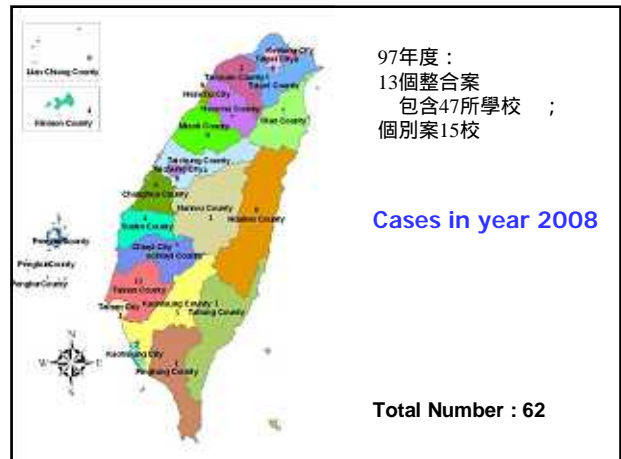
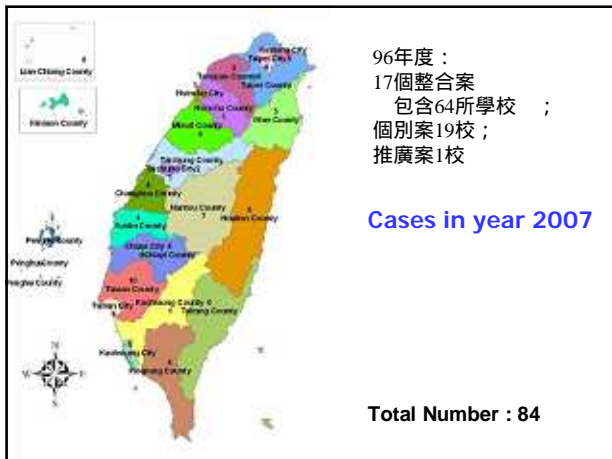
(not including "certificate" awardees)

Total Number : 112

95年度：  
23個整合案  
包含89所學校；  
個別案12校；  
獎勵案14校；  
推廣案2校

### Cases in year 2006

Total Number: 89



“Sustainable campus” can be found in 161 out of 319 counties/villages in Taiwan, as of 2008.

Counties/Villages where “sustainable campus” remained to be identified:

**Taipei County**  
Wulai Township, Pinglin Township, Rueifang Township, Bali Township, Gongliao Township, Wugu Township, Pingxi Township, Sindian City, Sinhuang City, Shenkeng Township, Shihding Township, Sijhih City, Banciao City, Yingge Township, Danshuei Township, Jhonghe City, Lujhou City, Yonghe City, Sansia Township, Tucheng City, Sanchong City

**Taoyuan County**  
Sinwu Township, Taoyuan City, Jhongli City, Longtan Township, Yangmei Township, Gueishan Township, Pingjhen City, Dasi Township

**Hsinchu County**  
Jhubei City, Sinfong Township, Sinpu Township, Guansi Township, Wufong Township

**Miaoli County**  
Nanhuang Township, Miaoli City, Jhunan Township, Houlong Township, Dahu Township, Judian Township, Toufen Township

**Taichung County**  
Shalu Township, Wurih Township, Dali City, Wufong Township, Taiping City, Houli Township, Dajia Township, Dadu Township

**Changhua County**  
Shengang Township, Dacun Township, Fangyuan Township, Beidou Township, Pitou Township, Dacheng Township, Changhua City, Fenyuan Township, Yuanlin Township, Puyan Township, Pusin Township, Shetou Township, Sioushuei Township

**Yunlin County**  
Douliou City, Dounan Township, Cihong Township, Dapi Township, Siluo Township, Erlun Township

**Nantou County**  
Nantou City, Jhushan Township, Puli Township, Sinyi Township, Shueili Township, Lugu Township, Jhongliao Township, Renai township, Jiji Township

**Chiayi County**  
Dalin Township, Meishan Township, Singang Township, Puzih City, Yijhu Township, Jhongpu Township, Dongshih Township, Shueishang Township, Alishan Township, Budai Township, Lucao Township, Jhuci Township

**Tainan County**  
Guantian Township, Dongshan Township, Houbi Township, Yujing Township, Sinying City, Baihe Township, Beimen Township, Yongkang City, Gueiren Township, Rende Township, Madou Township, Sinshih Township, Liouying Township, Jiali Township, Sinhua Township

**Kaohsiung County**  
Meinong Township, Liouguei Township, Daliao Township, Ciaotou Township, Gangshan Township, Zihguan Township, Jiading Township, Neimen Township, Lujhu Township, Shanlin Township, Cishan Township, Yanchau Township

**Pingtung County**  
 Jiuru Township, Kanding Township, Changjih Township, 鎮  
 Chaozhou Township, Neipu Township, Donggang Township,  
 Yanpu Township, Pingtung City, Laiyi Township, Ligang  
 Township, Sandimen Township, Majia Township, Wanluan  
 Township, Gaoshu Township, Liouciou Township

**Yilan County**  
 Yilan City, Toucheng Township, Luodong Township, Su-ao  
 Township, Yuanshan Township, Jhuangwei Township, Sansing  
 Township, Dongshan Township, Wujie Township, Jiaosi  
 Township

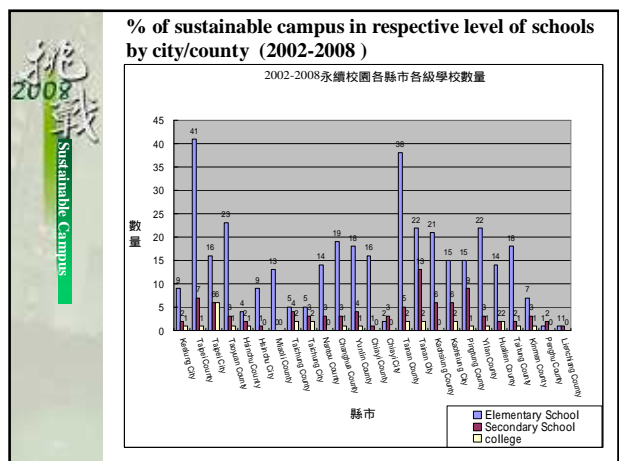
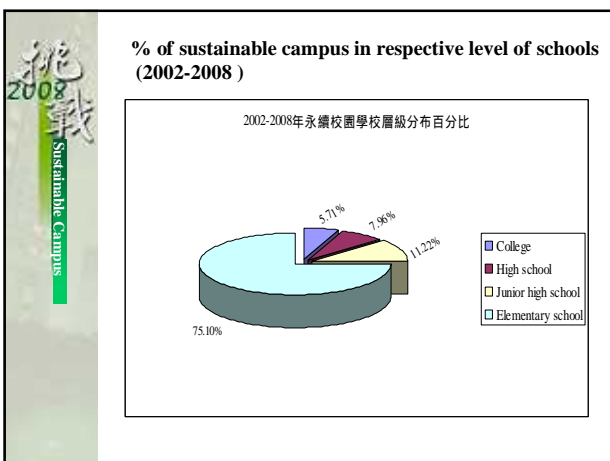
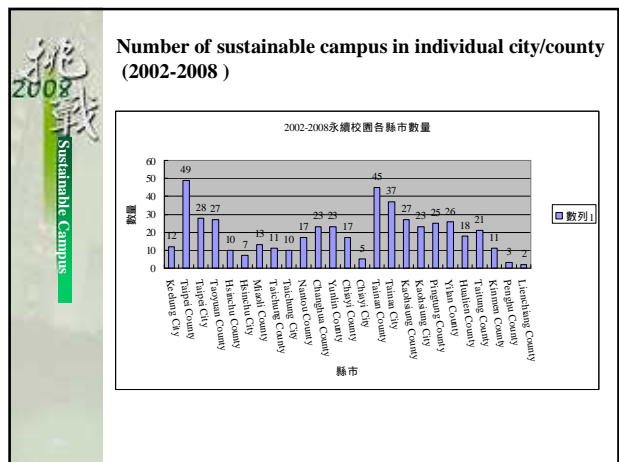
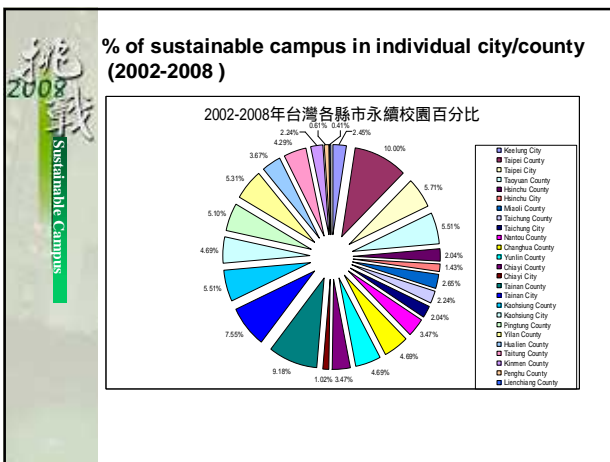
**Hualien County**  
 Fongbin Township, Yuli Township, Shoufong Township, Sioulin  
 Township, Sincheng Township

**Taitung County**  
 Taitung City, Beinan Township, Jinfong Township, Donghe  
 Township, Lanyu Township, Daren Township, Taimali Township,  
 Yanping Township

**Penghu County**  
 Wang-an Township, Cimei Township

**Lienchiang County**  
 Nangan Township

**Kinmen County**  
 Jincheng Township, Jinning Township, Lieyu Township, Jinhu  
 Township



### 台灣北、高二市及院轄市中永續校園之基地

縣市	行政區	已有永續基地之行政區數量	所在地之行政區數	所佔比例
Taipei City	Jonghng District, Datong District, Jhongshan District, Songshan District, Da-an District, Wanhua District, Shilin District, Neihsu District, Beitou District, Wunshan District	10	12	83.33%
	Keelung City	3	7	42.86%
Kaohsiung City	Ciargin District, Lingya District, Cianphen District, Nanzhi District, Siaoqiang District, Zuoying District	6	11	54.55%
Keelung City	Jhongshan District, Nuannuan District, Cidu District	3	7	42.86%
Heinchu City	Hsinchu City	1	1	100.00%
Taichung City	Central District, East Central District, South District, North District, Beitun District, Situn District, Nantun District	7	8	87.50%
Chiayi City	Chiayi City	1	1	100.00%
Tainan City	West Central District, East District, South District, North District, Anping District, Annan District	6	6	100.00%

### 台灣直轄市、省轄市及三一九鄉鎮中永續校園之基地

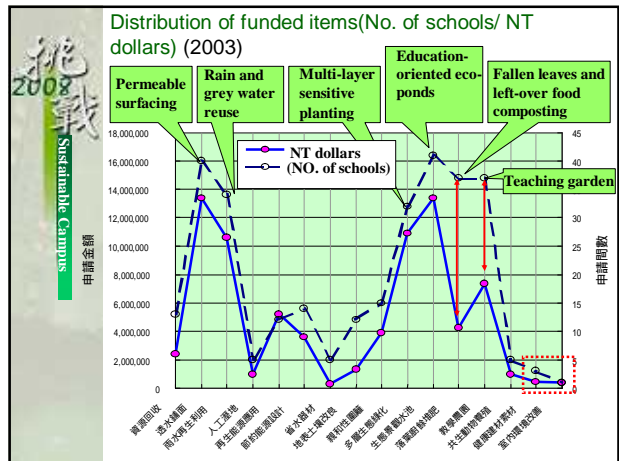
縣市別	鄉鎮市名	已有永續基地之數量	所在地之數量	百分比
Taipei County	Wulai Township, Pinglin Township, Ruifang Township, Bai Township, Gongliao Township, Wugu Township, Pingxi Township, Sincan City, Sijhuang City, Shengjing Township, Shiding Township, Sijhih City, Banciao City, Yingde Township, Dazhai Township, Jhonghe City, Lujhou City, Yonghe City, Sansia Township, Tucheng City, Sanchong City	21	29	72.41%
Taoyuan County	Sirwu Township, Taoyuan City, Jhongli City, Longtan Township, Yangmei Township, Gueishan Township, Pingzhen City, Dasi Township	8	13	61.54%
Hsinchu County	Jhubei City, Sinfong Township, Sinsu Township, Guansi Township, Wulong Township	5	13	38.46%
Miaoli County	Nanhuang Township, Miaoli City, Jhunan Township, Houlong Township, Dahu Township, Judian Township, Touden Township	7	18	38.89%
Taichung County	Shalu Township, Wurh Township, Dali City, Wulung Township, Taiping City, Houli Township, Daja Township, Dadu Township	8	21	38.10%
Changhu County	Shengang Township, Dacun Township, Fangyuan Township, Beidou Township, Pitou Township, Dacheng Township, Changhua City, Fenyan Township, Yuanlin Township, Puyan Township, Pusin Township, Shetou Township, Sioushuei Township	13	26	50.00%
Yunlin County	Douliou City, Douran Township, Chtong Township, Dapi Township, Siluo Township, Erlun Township	6	20	30.00%
Nantou County	Nantou City, Jhuatun Township, Fuli Township, Sinyi Township, Shuei Township, Lugu Township, Jhongliao Township, Renai Township, Jij Township	9	13	69.23%
Chiayi County	Dain Township, Meishan Township, Singang Township, Puzih City, Yihu Township, Jongsu Township, Dongshi Township, Shueistang Township, Alishan Township, Budai Township, Lucas Township, Jiua Township	12	18	66.67%

### Distribution of schools and items for sustainable renovation in the campus (2003)

Renovation item	Material reuse/ recycles	Infiltrating surfacing	Rain and grey water reuse	Artificial wetland: natural water purification system	Clean energy generation/ sustainable reuse	Energy saving design	Water-saving devices	Topsoil improvement
% of K12 sch in Nor	2.3%	13.2%	12.4%	2.3%	2.3%	3.9%	0.8%	5.4%
% of K12 sch in Cent	2.9%	8.7%	10.1%	2.9%	2.9%	4.3%	0.0%	4.3%
% of high sch in Cent	11.1%	11.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
南區圖中小之百分比	4.8%	13.1%	10.7%	7.1%	7.1%	7.1%	1.2%	1.2%
南區高中職之百分比	22.2%	33.3%	11.1%	0.0%	0.0%	0.0%	11.1%	0.0%
東區圖中小之百分比	4.2%	8.3%	4.2%	0.0%	4.2%	0.0%	8.3%	4.2%
% of K12 schools	3.3%	11.8%	10.8%	1.6%	3.9%	4.6%	1.3%	3.9%
% of High schools	16.7%	22.2%	5.6%	0.0%	0.0%	0.0%	5.6%	0.0%
Average	3.6%	11.1%	9.4%	1.4%	3.3%	3.9%	1.4%	3.3%

### Distribution of schools and items for sustainable renovation in the campus (2003)

Renovation item	Non-obtrusive barriers	Multi-layer sensitive planting	Education oriented (landscaped) ecoponds	Fallen leaves and left-over food composting	Teaching garden	Animals co-habitation in symbiosis	Using organic/natural/recyclable building materials	Indoor environment improvement
% of K12 sch in Nor	3.9%	10.1%	14.0%	8.5%	10.9%	1.6%	1.6%	0.8%
% of K12 sch in Cent	10.1%	13.0%	14.5%	13.0%	13.0%	4.3%	0.0%	0.0%
% of high sch in Cent	11.1%	11.1%	0.0%	11.1%	11.1%	0.0%	0.0%	0.0%
南區圖中小之百分比	1.2%	6.0%	10.7%	14.3%	13.1%	0.0%	1.2%	0.0%
南區高中職之百分比	0.0%	0.0%	0.0%	22.2%	0.0%	0.0%	0.0%	0.0%
東區圖中小之百分比	4.2%	16.7%	16.7%	8.3%	8.3%	0.0%	0.0%	0.0%
% of K12 schools	4.6%	10.1%	13.4%	11.1%	11.8%	1.6%	1.0%	0.3%
% of High schools	5.6%	5.6%	0.0%	16.7%	5.6%	0.0%	0.0%	0.0%
Average	4.2%	8.9%	11.4%	10.3%	10.3%	1.4%	0.8%	0.3%





2008 挑戰 Sustainable Campus


## What have we accomplished?

2008 挑戰 Sustainable Campus

### Ecology(2003)


The percentage of green-covering area increased from an average of 23.4% to 35.8% for those participating campuses.

The permeable ground surface was 12.8% .




### Resource application (2003)

22.6% of the schools funded have successfully integrated compost from foliages and kitchen waste into the use of their organic farm .




10.6% schools have incorporated the use of drained and recycled water in their daily functions .



2008 挑戰 Sustainable Campus

### Renewable energy (2003)

33.2% of the funded projects have demonstrated their opportunities in utilizing “renewable energy” for actual use and teaching purposes.



### Change of educational environment (2003)

More than 80% of the funded projects have successfully creating a more versatile teaching environment through the Program, and the meaningful process and outputs have been shared among the schools and the neighboring communities.



### Community participation

多數學校活動與社區營造發生關連，從地域特色角度思考創造多元化文化與地域人文素養



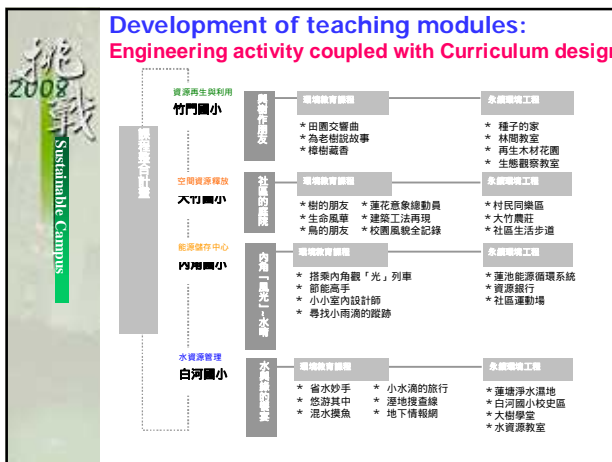
### Community participation

Wun-Shan elementary school




全體動員並邀家長參與，為校園內約兩百年樹齡的老楓香樹鑄卵石，以生態工法取代原有的水泥基座，讓老楓香樹根更透氣，藉此培養凝聚社區意識。

### Concurrent development of teaching modules and curriculum reform



### Teaching plan designed to be integrated with the execution of 『Sustainable Campus』 renovation

Teaching plan	contents
Teachers involved	
Renovation subjects funded	
Teaching theme	
Area to be integrated	
Teaching contents	
Learning stage	
Intended duration and time for the material	
Resources application	
Other unique strength	

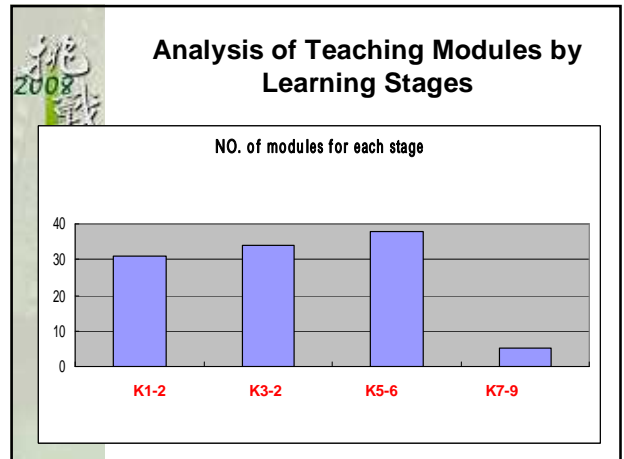
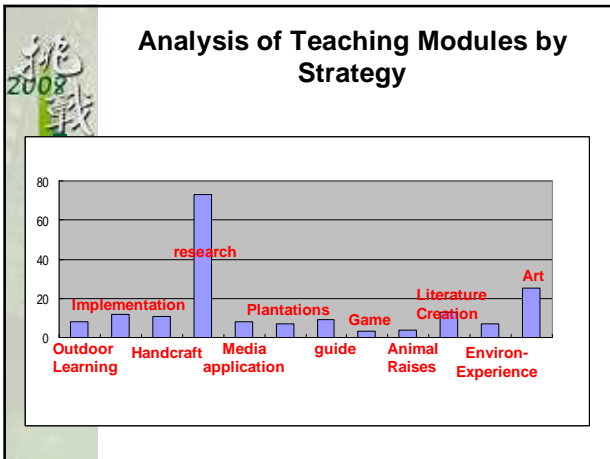
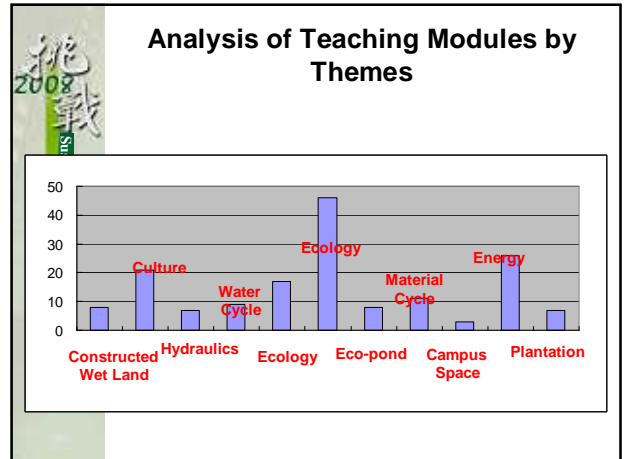
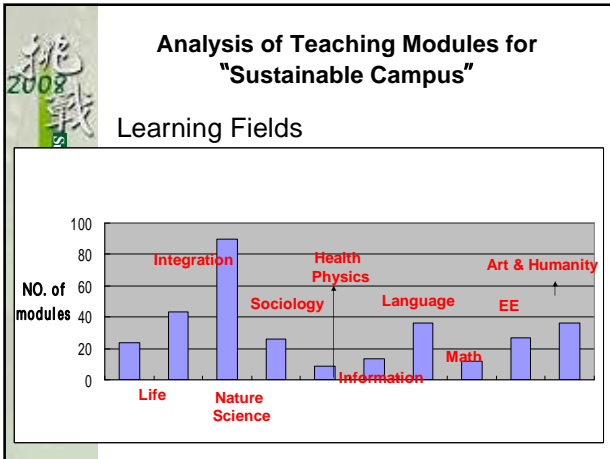
### 九十二年學校教案彙整

#### 學校教案名稱

學校	教案名稱
宜蘭縣羅東東北成國小	認識校園昆蟲、認識水生植物、社區生態觀察
臺北縣板橋大觀國中	有機農園、落葉堆肥、能源教育(導光遮陽板、節省能源)、水循環、有機生活
臺北縣坪林國中	認識茶樹
國立竹北高級中學	生態教學、資源回收
南投縣立瑞竹國中	文章寫作(水生池)
台南市中區進學國小	拯救老樹 生命教育、學校本位課程
台南縣北門鄉雙春國小	水鳥教學、海濱植物教學
台南縣白河鎮竹門國小	植物染教學
高雄市小港區漢民國小	彩繪 儲水樑、水循環
花蓮縣立自強國中	鄉土教學 學校本位課程

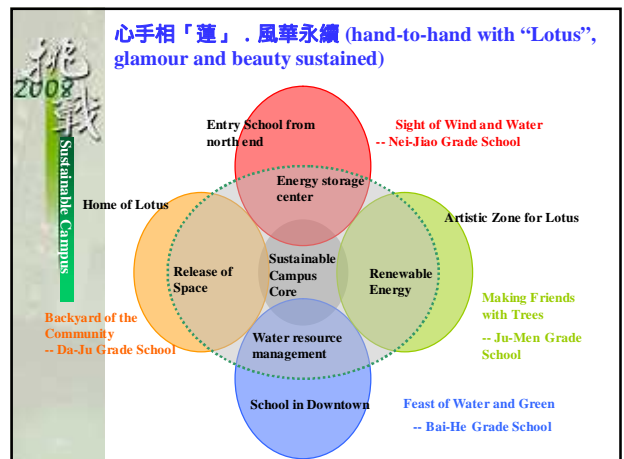
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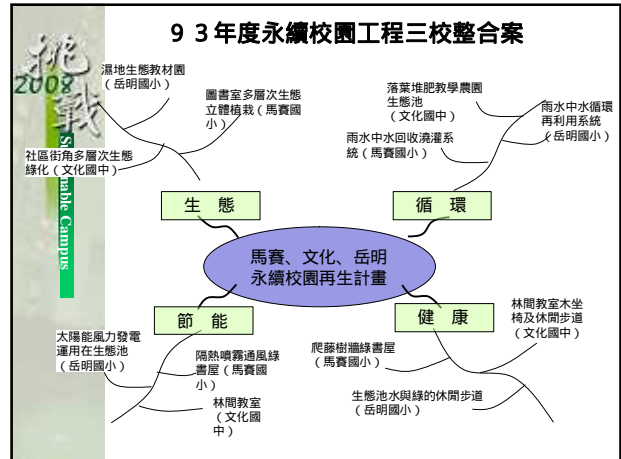
Subjects	Percentage
Teaching contents design	20%
Number of hours and students participated	15%
Dissemination of the core values	20%
Archive of the learning records	20%
Self-reflection by the teachers	10%
Learning effectiveness of the students	15%



## Continuing evolvement of "sustainable campus" programme

### Integrated Program (Group) Project





2008 Sustainable Campus

**Unique characteristics**

*(Platform to merge and integrate expertise of environmental sciences/ engineering and environmental education)*

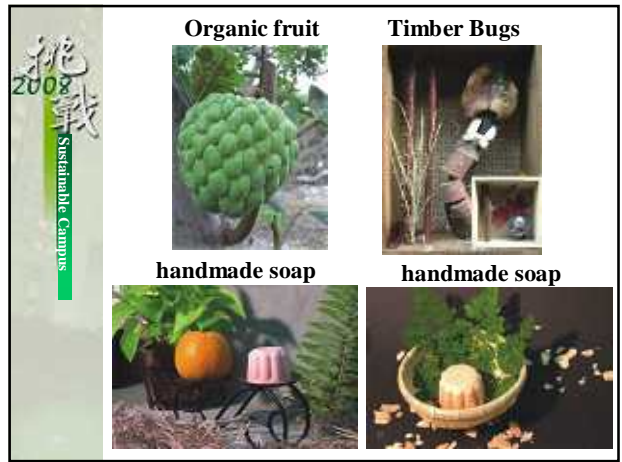
**Learning in the environment by doing**

**Increased exposure to the nature**

**Resource sharing**

**Participation by the community**






**Continuing evolvement of the project**

- University level
- Summer program
- Eco-tour



**Pilot program for “sustainable campus” program in the Universities**  
**National Taiwan University**  
 生態池








**Pilot program for “sustainable campus” program in the Universities**  
**National Taiwan University**





**Pilot program for “sustainable campus” program in the Universities**  
**Tainan National University of the Arts**




**Tainan National University of the Arts** Green Building


**Pilot program for “sustainable campus” program in the Universities**  
**National University of Kaohsiung**




**2008 挑戰 Sustainable Campus**

**Pilot program for "sustainable campus" program in the Universities**

National Ping Tung University of Science & Technology

**2008 挑戰 Sustainable Campus**

**Pilot program for "sustainable campus" program in the Universities**

National Taiwan Normal University  
生態池

**2008 挑戰 Sustainable Campus**

**Pilot program for "sustainable campus" program in the Universities**

National Taiwan Normal University  
Roof-top farmland

**2008 挑戰 Sustainable Campus**

**Summer scholarship program**

**2008 挑戰 Sustainable Campus**

大專生協力地方推動永續校園計畫

東海大學建築研究所學生團隊

**2008 挑戰 Sustainable Campus**

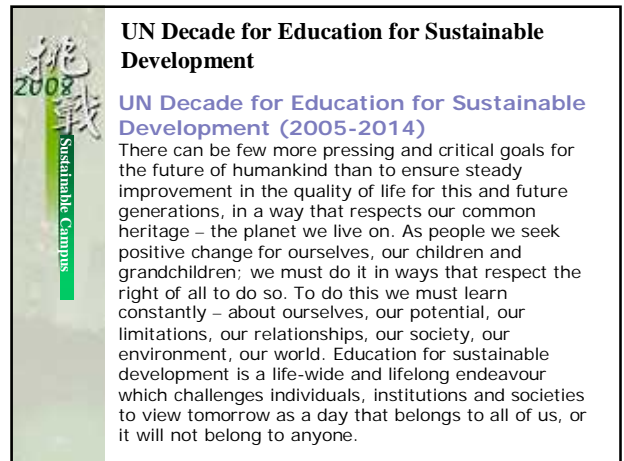
大專生協力地方推動永續校園計畫

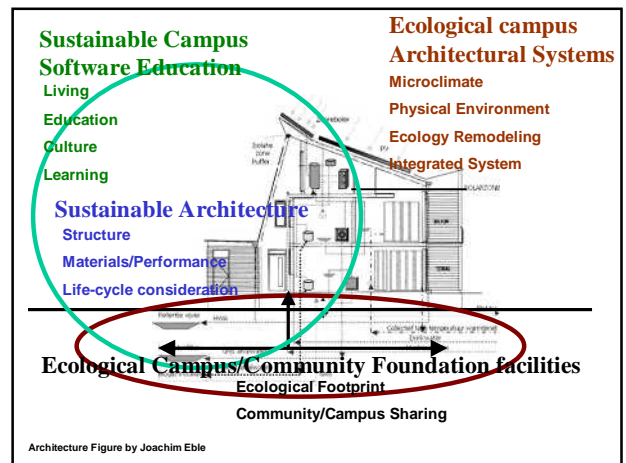
東海大學建築研究所學生團隊



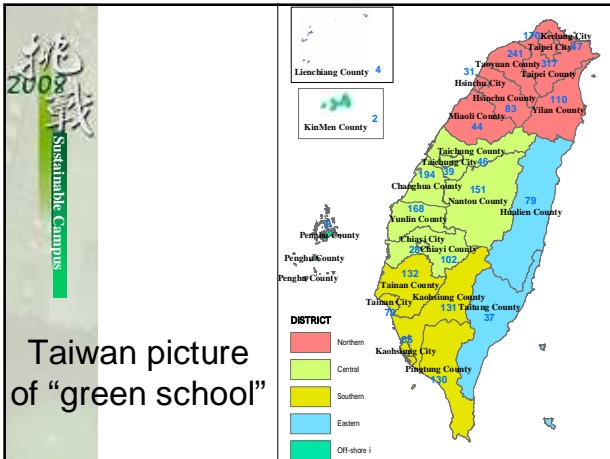












**What have we accomplished ? (2004)**

- The percentage of green-covering area increased from an average of 23.4% to 35.8% for those participating campuses.
- The permeable ground surface raised 12.8%, 15641.41m<sup>2</sup> in 2004.
- 22.6% of the schools funded have successfully integrated compost from foliages and kitchen waste into the use of their organic farm .
- 3.2% of the funded projects have demonstrated their opportunities in utilizing "renewable energy" for actual use and teaching purposes.
- 10.6% schools have incorporated the use of drained and recycled water in their daily functions .
- More than 80% of the funded projects have successfully creating a more versatile teaching environment through the Program, and the meaningful process and outputs have been shared among the schools and the neighboring communities.

