

# Green Challenges: Sustaining a Green Campus in the New Millennium



*Prof. K. M. Chan  
Chairman of the University Steering Committee  
on Environment*

Blessed with a beautiful scene at the shore of Tolo Harbour, the campus of the Chinese University is located next to Tai Po Kau Natural Reserve, surrounded by six wonderful country parks in the New Territories. Facing recent rapid development in the Hong Kong SAR, the campus has been facing the threat from land reclamation in the Tolo Harbour and her own activities, including slope improvement projects, renovation works, construction of new hostels and teaching buildings in the past few years.

Protecting the environment, conserving natural resources, planting more trees, reducing waste and lowering energy expenditure are our consensus in keeping the Chinese University a clean, green, quiet and sustainable campus. Last year, the University started to develop an efficient environmental man-

agement structure and identified a few environmental problems to set targets for various action plans. I am glad to report here to you that we have made significant progress in improving our recyclable waste collection and chemical waste collection schemes. Looking ahead, promoting the concepts of "green mind" to staff and students is our continuing endeavour.

I sincerely thank those who help to make the campus green and clean. Without them, our task could not have been accomplished. I am sure our campus would become the most environmental-friendly University in the region as our friends, alumni, colleagues and students all work together to make it more than just clean and green, but also self-efficient and sustainable.

# ENVIRONMENTAL POLICY

The Chinese University of Hong Kong seeks continually to improve the environmental quality of the campus to provide a congenial environment for teaching, learning and scholastic activities.

The University is committed to ensuring that all activities run by the University are conducted in an environmentally responsible manner and has adopted the following guidelines in pursuance of this commitment:

- We endeavour to build a clean and green campus congenial to the fulfillment of the purposes of the University;
- We seek to comply with all applicable environmental legislation, standards and regulations;
- We avoid, reduce or control environmental pollution arising from our activities and to require our contractors to adopt and implement similar environmental measures;
- We seek continual improvement in the efficient use of energy and other natural resources;
- We raise environmental awareness among staff and students and set the University as a model in environmental education and environmental management;
- We ensure good management practices by reviewing them regularly and ensure that they are tuned to the changing internal and external circumstances.



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# Green Campus

## Green Campus

The campus of The Chinese University of Hong Kong (CUHK) is located at the southwest shore of Tolo Harbour, situated between the Tai Po and Shatin New Towns. The campus site is surrounded by Pat Shin Range to the northeast, with summits rising 600m above sea level, the Plover Cove Country Park to its north, Tai Mo Shan to its west, Shing Mun Country Park to its southwest and Ma On Shan and Sai Kung to its east.

More than 100 tree and shrub species, mostly native, can be found along the roadside and the trail paths. Last year, the Landscape Section planted 211 trees, 7010 shrubs, 12,009 flower plants, 12,304 ground cover and 7,439m<sup>2</sup> of grass. Currently, above 90% of the campus area is covered by plants and planting activities are regularly arranged to increase the coverage further. An education-trail was designed by the students of the Department of Biology with labels hung on identified plants. Large number of birds, recorded with more than 70 species, have been taking advantage of this favourable environment.

There are over 300 slopes around campus and approximately 40 of them are classified as dangerous slopes under the Dangerous Slope Hillside Order from the Building Department, HKSAR. The Campus Development Office (CDO) hires consultants and contractors to carry out the slope stability works to prevent fall of rock and soil erosion. In the design and construction stages, the landscape architects consider the factors of civil engineering, ecology and other environmental issues and 3% of the project sum is budgeted for greening the slope.

To develop the science of Chinese herbal medicine in Hong Kong, five Chinese Herb Gardens are established in the main campus and Colleges for growing rare and valuable herbal species used in traditional Chinese Medicine.



*More than 100 Plant Species in Campus.*



*Trees and Shrubs are planted on the slope.*



*Chinese Herb Garden*

# Parties Steering on the Environmental Issues

The environmental policy maker in CUHK is the University Steering Committee on Environment (USCE). This Committee draws expertise from across the campus to ensure appropriate coverage and reports to the Administrative Affairs Committee of the University. USCE looks after co-ordination, monitoring, training, and communication matters, and the development of environmental management systems within CUHK.

The University Safety and Environment Office (USEO) is the co-ordinator for relevant offices such as the Estates Management Office, the Campus Development Office and the Transport Unit to assist USCE in implementing of various environmental projects and plans. Environmental committees are formed in each College to promote environmental protection and education:



## Chung Chi College

The Campus Environmental Committee of Chung Chi aims to promote environmental awareness among students and staff and to maintain a high standard of environmental hygiene on campus. In January 2001, the Committee organised the Environmental Protection Cup with various interhostel competitions such as Water Saving, Electricity Saving, Used Paper Collection, Used Aluminum Cans, Used Plastic Bottles Collection and Slogan Design. In March 2001, the Environmental Protection Week with Board Exhibition, Assembly on Environmental Protection and Tea Session Gathering were held to arouse the students' general awareness on environmental protection.



### New Asia College

Committee of New Asia posts the current affairs of environment on the notice boards. Besides, the Environmental Week 2001 themed "Economy and Environmental Protection" was held in March. A series of activities including College Biweekly Special Lecture, Academic Seminar, Photo Competition and Debate were held.



### Shaw College

The Environmental Enhancement Committee of Shaw College formulates the College's policies and measures for the betterment of the campus environment; and promotes the general awareness among students and staff of environment hygiene, campus ecology and related matters.

In October 2000, Mr. Ho Wai-chi, Executive Director of Green Peace, was invited to launch a speech for 500 staff and students to encourage them to participate actively in the local environmental protection activities. In November, a survey through electronic mail was conducted to investigate and collect ideas from the every corner of the College.



### United College

In 2000 - 2001, the Environmental Committee of United College made a full effort to encourage staff and students to practise waste recycling by promotion and increasing the number of recycling bins at strategic locations in the College. Apart from that, an Organic Farming Interest Group has been set up to organise a series of activities such as visits, workshop and planting vegetables, flowers and fruits on campus.



# Cleaning the Air

## Cleaning the Air

School bus is the most important mode of transportation to move people around the campus. To reduce black smoke, all 12 school buses owned by CUHK are regularly maintained and installed with diesel oxidation catalytic converters. Testing has shown significant reduction in black smoke, particulates, and carbon monoxide. The Transport Unit also requires that shuttle buses hired from the contractors are properly maintained. All drivers are instructed to switch off the engine when the vehicle is idle.

Other environmental friendly means of transport for staff and students are also designed:

- Trails have been built between Colleges and the main campus.
- Buildings have been designed so that its elevators can provide access to different topographical levels.
- Trial runs of electrical and LPG mini-buses have been conducted by the Transport Unit.

Apart from school buses, canteen and construction activities are also the main sources of air pollution. To reduce pollution, scrubbers, electrostatic precipitators and kitchen exhaust extension to rooftop are installed in all university canteens and restaurants to prevent any noticeable catering odour. Besides, dust suppression measures such as wetting and canvas covering are used to minimise the dust emission during construction works.

Indoor air quality (IAQ) is also a main environmental concern. The ventilation system of all academic and administrative buildings is properly maintained to ensure its effectiveness, and monitoring of temperature, humidity, carbon dioxide, volatile organic compound (VOC), etc. is regularly conducted to ensure a healthy environment for staff and students.



All CUHK buses are installed with diesel oxidation catalytic converters.



Trial Run of Electrical Motorcycle



Monitoring of Indoor Air Quality is conducted in various department offices.

# Quiet World

## Quiet World

In the campus of CUHK, no construction work is allowed during the period 7:00pm to 7:00am on weekdays and any time on Sundays or public holidays. If possible, all the major works on campus are carried out in the summer months to avoid noise disturbance to academic activities. The construction sites are enclosed by hoardings or noise barriers and all equipment to be used is properly maintained. Moreover sound-reducing measures such as silencers, mufflers, acoustic shields, etc, are used in the noisy construction activities.

To eliminate the nuisance caused by traffic noise, all University vehicles are properly maintained by the vehicle maintenance workshop operated by the Transport Unit. Besides, trees are planted on the roadside as noise barriers to reduce the sound transmission to the nearby classrooms and residences. The



*Hording of Construction Site*

cooling tower of ventilation system is another noise source in the quiet campus. Therefore, the Building Services Section of the Estates Management Office prepares the maintenance schedule to ensure proper operation.

Noise level measurement is conducted by appropriately trained persons to monitor the occupational noise to the staff and the environmental noise to noise sensitive receiver such as offices, lecture rooms, residences, etc. Corrective measures will be taken if any non-conformance is found.



*Tree Barrier on Roadside*

# Four "R" Strategy

## Four "R" Strategy

Being a tertiary institution with about 4,500 staff and 13,000 students some of whom live on the campus, waste generation is a very difficult environmental problem to tackle in the CUHK. Wastes are generated daily by offices, laboratories, canteens, residences and student hostels. Tremendous effort is spent to remove and dispose of about 50,000 litres of refuse per day. To reduce the huge waste loading and improve the utilisation of resources, the University encourages staff and students to adopt 4 "R" Strategy of Reduce, Replace, Reuse and Recycle in our daily activities.

For instance, all staff are encouraged to adopt double-sided printing and reuse the single-side used paper. Email accounts are provided for all administrative staff for internal communication to replace hardcopies of documents. Promotion programmes are conducted to encourage the staff and students to have meals in the canteen, if possible, instead of take-away and to bring their own food containers instead of using disposable ones. The canteen operators are also proactively reducing foam lunch boxes by degradable lunch boxes.

In addition, more than 50 sets of colour recycle bins are placed in the campus for the separation of recyclable wastes such as waste paper, plastic bottles and aluminum cans into the recycle boxes. There are 19 large waste paper cages, 5 toner cartridge recycling bins and 10 A4 paper recycling bins installed on campus to facilitate waste reduction.

Quantity of Recyclables Recovered	1999 - 2000	2000 - 2001
Waste Paper (Kg)	60,400	261,950
Aluminum Cans (Pcs)	10,500	44,600
Plastic Bottles (Kg)	145	1280
Printer Cartridges (Number)	No Data	168



3-Colour Recycle Bins are placed everywhere within campus to facilitate the segregation of wastes.



The students participated in the Waste Reduction Competition organised by the Environmental Campaign Committee.



In the long run, CUHK is committed to reduce wastes by at least 20% by the end of 2007.

CUHK joined the Working Group for the Tertiary Institutions since 1999 to promote waste reduction and recycling with other tertiary institutions. In December 2000, a waste reduction meeting was held in CUHK with other tertiary institutions and the Chairman of USCE, Professor KM Chan gave a presentation to share the experience in environmental protection and waste reduction. A training workshop was organised by the Environmental Protection Department (EPD) on waste reduction in February 2001. About 40 staff and students attended the workshop to learn more about waste reduction. Collection programmes were initiated to collect old items such as clothing, books, toys, computers, etc. for charity and to help the people in need.



Licensed collectors are employed to collect the chemical wastes and biological wastes for disposal.



The student representative received the Prize of Merit of Waste Reduction Competition from Mrs. Peggy Lam, SBS, JP, Founder Chairman of ECC.

The University Safety & Environment Office (USEO) manages the disposal of biological and chemical wastes generated on campus. To prevent contamination of the environment, all these wastes are properly stored and then collected by licensed collectors. Moreover, the radioactive waste store is managed by USEO for radioactive wastes to decay.

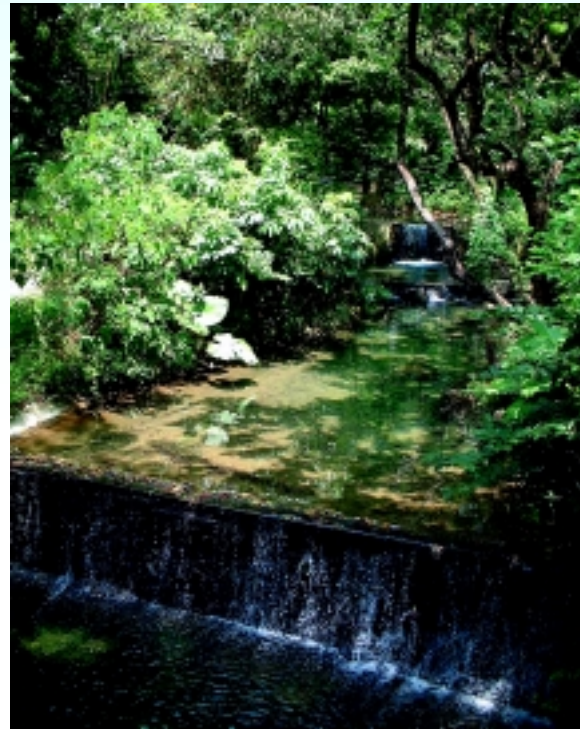
Year	Chemical Wastes Waste Volume (Kg)	Biological Wastes Waste Volume (Kg)
1998	19,244	No Data
1999	15,853	No Data
2000	24,241	17,000
2001	28,188	26,000

# Protecting the Waters

## Protecting the Waters

Water, being one of the most important resources on the planet, is essential to our daily activities. According to the data from Water Supplies Department, 90,000m<sup>3</sup> water is consumed by CUHK per month. To minimise water consumption, automatic cut-off taps are being used in washing room to prevent wastage of water. Posters and stickers are posted to remind users not to waste water during washing. Water reduction competition is also launched in the student hostels to encourage students to consume less water.

There are two natural watercourses in the University: the eastern one originates from the village of Chek Lai Ping and the western one originates from the New Asia Campus, going into the Tolo Harbour via the Weiyuan Lake. A network of storm drains and sewers has also been built in the past three decades. The storm drains were built to collect rain water and surface run-off from road surfaces and roof-tops, and to divert them into the natural watercourses. The wastewater generated from



*Water quality of storm drain and stream are regularly monitored by relevant departments.*

residences, student hostels, offices, laboratories, canteens, etc, are discharged to the sewers and channelled to the Shatin Treatment Works for disposal. A grease trap is installed in each canteen to segregate the oily waste and wastewater to reduce the loading of treatment. Cleaners and workers are instructed not to discharge the wastewater or chemical wastes such as spent lube oil and paint into the storm drains. Chemical waste disposal guidelines are prepared for the research staff of laboratories for dumping the chemical wastes generated by the laboratory activities. To ensure the effectiveness of these measures, water quality is regularly monitored at different locations.

In the coming year, a comprehensive water monitoring plan will be implemented to monitor and control the quality of water for drinking, flushing, chilling and in the swimming pool, the drainage system, streams and lakes.

# Energy Conservation

## Energy Conservation

Unlike other tertiary institutions, our campus accommodates 38 blocks of staff residences and 27 blocks of student hostels, in addition to 52 blocks of academic and administrative buildings. All electrical consumption is recorded by a power tariff meter yielding a large bulk reading. On average, each FTE (full-time equivalent) student consumes about 4,400 KWH annually. This appears to be quite high because most of the students (including over 4,000 postgraduates) stay more than 12 hours daily in classrooms, libraries, laboratories and other building areas. To curb the increasing trend in electricity consumption, energy conservation in CUHK is a high priority task. To coordinate and promote energy conservation, the Energy Savings Task Force was established in April 1999 to organise a series of programmes. In 2000, the electricity consumption of CUHK including both the residential and non-residential areas was the lowest among all the local Universities based on consumption per gross floor area.

### **Energy Efficient Lighting Retrofit Programme**

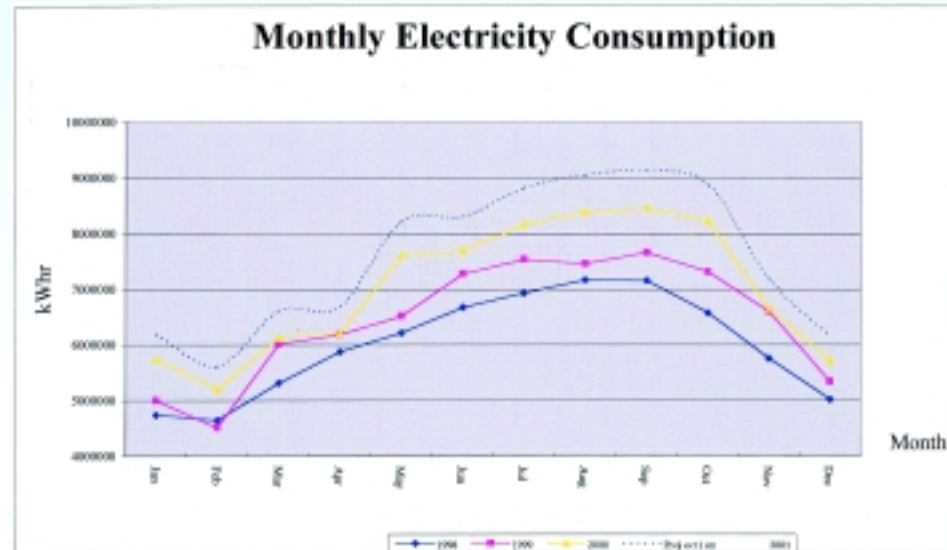
The Estates Management Office (EMO) implemented the DSM (Demand Side Management) programme in 2000 to improve the energy performance of the lighting system. Through the Non-Residential Energy Efficient Lighting Retrofit Project and with the special funding allocated from the Resources Allocation Committee (RAC), the programme has the approval from China Light and Power Holdings Ltd. (CLP). Stage 1 of the project, covering 21 buildings, commenced in December 2000 and was completed in April 2001. CUHK was the pioneer in

Hong Kong in introducing the modern T5 lighting system in most of the buildings instead of adopting the T8 lighting system used in most similar projects. It is anticipated that the improved lighting illumination in Phase 1 buildings enables a savings of more than \$700,000 annually in electricity cost.

### **Pilot Energy Management Opportunities Projects**

The pilot programme has been implemented in two consecutive financial years commencing 1999. The programme covers:

- the air-cooled chillers at the Pi Ch'iu Building replaced by water-cooled chillers in August 2000;
- automatic power correction by capacitor compensation (Power Factor Correction) implemented;
- pilot studies of Indoor Air Quality (IAQ) conducted in the libraries and continuous study will be conducted; and
- improvement programme launched for enhancing indoor air quality of 15 selected academic buildings.





The air-cooled chiller at the Pi Ch'u Building was replaced by a water-cooled chiller.

The Winning Logo of Energy Conservation Logo Design Competition.



### ***Incentive Energy Conservation Programme***

The objective of the Incentive Programme is to develop a culture of energy conservation in the University community. The programme will consist of two phases:

- Self Energy Audit & Conservation Study by User Groups
- Energy Conservation Competition

It is proposed that incentive bonuses will be awarded to the winner units for organising student and staff activities, or for sponsoring environmental conservation activities or staff motivation schemes.

### ***Use of Electrical Appliances with Energy Efficiency Label***

Staff are encouraged to purchase electrical appliances including air-conditioners, refrigerators, lighting equipment and ventilation fans with energy efficiency labels issued by the Electrical and Mechanical Services Department.

### ***Energy Conservation Logo Design Competition***

EMO organised an Energy Conservation Logo Design Competition in February 2001 to make the staff and students more aware of the importance of energy conservation. The winning logo is posted onto the switch control of various offices and lecture rooms to remind people of switching off the electricity supply when they leave the room.

### ***Electricity Cost for Different Local Universities in 1999/2000***

#### ***For Head Count:***

CUHK = HK\$3,340/FTE

University A = HK\$3,132/FTE

University B = HK\$5,063/FTE

University C = HK\$5,057/FTE

#### ***For Gross Floor Area:***

CUHK = HK\$208/m<sup>2</sup>

University A = HK\$215/m<sup>2</sup>

University B = HK\$212/m<sup>2</sup>

University C = HK\$238/m<sup>2</sup>

#### ***Remarks:***

FTE - Full-Time Equivalent Person

GFA - Gross Floor Area

CUHK campus includes non-residential and residential areas.

# Fighting Pollution

## Fighting Pollution

Under the University Steering Committee on Environment (USCE), three Sub-committees with representatives from administrative offices, academic departments and students are responsible for the improvement on campus environment: Task Force to Improve on Environmental Black Spots regularly inspects the environmental black spots such as construction sites and waste collection points; Canteen Hygiene Action Team checks the food and canteen hygiene; and Air Pollution Action Team monitors the air quality on campus.

Besides, professionals such as the Transport Officer, the Canteen Service Officer, the Safety Officer and the Environmental Officer are engaged to

oversee the daily operation of campus transport, canteens and restaurants, construction sites, laboratories, etc. and to ensure that relevant staff conduct their duties in environmental responsible ways.

Last year, the Environmental Hotline (2609 8666) was set up as a communication channel for the staff, students and interested parties for enquiries

of environmental information, exchange the ideas of environmental protection, complaints of environmental pollution, etc. The Environmental Officer will follow up each case according to its nature and submit report thereof to the USEC if necessary.



*The staff of USEO regularly inspects the housekeeping and safety and environmental compliance of construction sites.*



*The staff of USEO monitored the occupational and environmental noise of construction activities.*

# Enhancing Community Awareness

## Enhancing Community Awareness

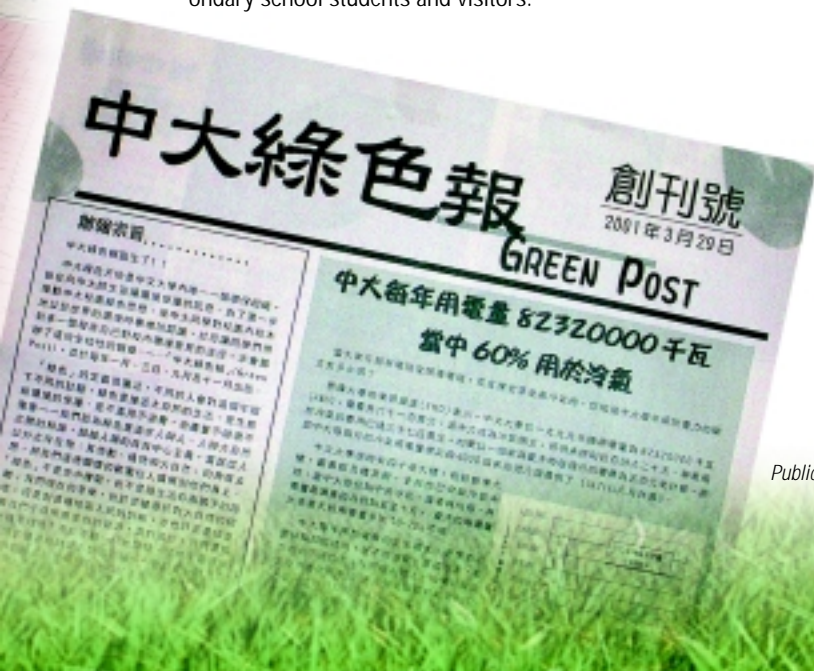
Many programmes were arranged for the staff to enhance their environmental awareness. First of all, the induction talk on "Work Safety & Environmental Protection" is given for the newly recruited staff to provide them with the most basic knowledge of safety and environmental protection in their daily life. Besides, on-the-job training or seminar will be arranged for the appropriate staff to ensure their competency in performing their duties in an environmental responsible way. The University Safety and Environment Office regularly issues bulletins and updates the web (<http://www.cuhk.edu.hk/useo>) to provide the most updated environmental legislation, news and information for staff and students.

Green societies such as Green World, Environmental Science Society and Geography Society are organised voluntarily by the students to promote environmental programmes and activities to make students aware of various environmental issues.

In October 2000, an Environmental Promotion Booth was set up on the Orientation Day for Sixth Former to enhance the important environmental awareness message among the secondary school students and visitors.



Orientation Day for Sixth Formers 2000.



Publication of 1st Volume Green Post.



Induction Talk on "Work Safety & Environmental Protection for Newly Recruited Staff."

# Environmental Protection Week

## Environmental Protection Week 2001

To raise environmental awareness and to promote environmental friendly practices among members of the campus community, the University held an Environmental Protection Week from 9th to 15th February 2001. The week featured a Tree Planting Ceremony, Green Campus Exhibition Tour, a Waste Reduction Workshop, an Environmental Protection and Cleaning Walk, a Photo Contest, an Energy-saving Logo Design Contest, and an Energy Usage Guessing Game. There were also a debate on the topic "Should all disposable tablewares be prohibited in CUHK?" and a forum on "Hong Kong 2030 – Planning Vision and Strategy".

The guests of honour at the Opening Ceremony included Mrs. Lily Yam Kwan Pui-ying, Secretary for the Environment and Food; Mrs. Lessie Wei Chui Kit-ye, Director of the Agriculture, Fisheries and Conservation Department; Mr. Robert J.S. Law, Director of the Environmental Protection Department; Prof. Arthur K.C. Li, Vice-Chancellor; Prof. Liu Pak-wai, Pro-Vice-Chancellor; Prof. Chan King-ming, Chairman of the University Steering Committee on Environment; and the staff and student representatives. In her address, Mrs. Lily Yam commended the University for having taken the lead to promote environmental consciousness in the tertiary sector and to support the government's call to build a clean Hong Kong. She was also accompanied by the Vice-Chancellor and other guests at the entrance of the University to officiate a Tree Planting Ceremony.



*Opening Ceremony of Environmental Protection Week 2001*



*Tree Planting Activity of the Environmental Protection Week 2001*

Environmental Protection and Cleaning Walk



Debate on "Should all disposable tablewares be prohibited in CUHK?"

Forum on "Hong Kong 2030 - Planning Vision and Strategy"



Green Campus Exhibition





# Achieving Sustainable Development

It is believed that both scientific research and education are essential to help to achieve the sustainable development. Being the leading tertiary educational institute in Hong Kong, CUHK is proud to be a pioneer in these activities. To instill in students a sense of environmental responsibility and principles of sustainability, environmental courses are designated as required courses in the General Education Programmes. Besides, a wide range of specialised courses is offered by the Environmental Science Programme and the Geography Department. The subjects such as Ecology, Environmental Chemistry, Environmental Impact Assessment, Conservation Biology, etc are run to educate the undergraduate and postgraduate students with the knowledge of the natural environment. The Centre for Environmental Policy and Resources Management (formerly known as the Centre for Environmental Studies) facilitates and

coordinates collaborative research in environmental science across departmental boundaries and fosters a multidisciplinary approach to the evaluation and analysis of environmental and resource issues. Besides, the Joint Laboratory for Geoinformation Science of the University and the Chinese Academy of Science used the Aerial Infra-Red Remote Sensing Technique to identify vegetation growth, water quality and land use pattern and to investigate the environment of Hong Kong.

The University regularly invites scholars and guest speakers from all over the world to exchange ideas and deliver speeches in seminars for academics and the general public. In April 2001, the Minister of British Foreign and Commonwealth Office, Mr. John Battle, MP, delivered a public lecture entitled "The World Environment: Where do we go from here?" In May, over 60 scholars from the mainland, the USA and Hong Kong participated in the "International Conference on Environment and Culture: Beijing, Hong Kong and New York", examining the environmental history and cultural development of the three cities.



*Mr. John Battle delivered a public lecture in April.*



*Mapping of Mai Po Marsh by the Aerial Infra-red Remote Sensing Technique.*