



## **Education and Sustainable Development**

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### **Education alone is not enough - inducing environmental-friendly behavior using economic incentives**

#### **1. Taiwan's efforts in environmental education**

In the past decades, Taiwan has overcome its shortage of natural resources and the immense difficulty of re-building the island following the Second World War. The result is the impressive economic achievement. However, in the 1980's, the social value of worshipping economic accomplishment at the early stage has been strongly challenged by the apparent heightening of environmental awareness, especially in aspects such as environmental protection and sustainable development. The reason behind the value transformation was a result of hard lessons learned through successive environmental crises, both natural and man-made. As an island nation with limited natural resources and at the same time having the world's second-highest population density among countries whose population is above 10 million, the efficient use of resources is not just for economic reason, but a crucial issue for the long-term development of the nation.

As a result, environmental education has been introduced into the school curriculum in Taiwan since 1990, covering wide range of topics including basic concept of ecology, environmental issues (such as global warming, landslide, energy, water pollution, nuclear waste disposal, air pollution, ... etc.) and the ways in which they influenced the development of the society (sustainable development, biodiversity) to enhance the understanding of the environmental opportunities and actions in everyday life (such as resources conservation, recycling, simple lifestyle, eco-design, green consumption,... etc). From 1997 onward, the focus of environmental education has moved from pollution control to sustainable development due to the change of environmental problems in Taiwan per se. The environmental education also follows the principle of lifelong learning, course integration, active participation in problem solving, balance between global and local perspectives, sustainable development and international co-operation.

The core objective of the above mentioned courses is to enhance environmental awareness within school children, including environmental concept, value and know/ledge, to build up intrinsic motivations (public spirit and civic duty), and last but not least to induce environmental-friendly behavior.

Similar to Japan, France and Australia, Taiwan has adopted the "whole school approach" in delivering environmental education. This relates to the multi-disciplinary nature of

environmental education. Environmental courses are taught in areas of social sciences, art and humanity, languages, natural sciences, health and sports.

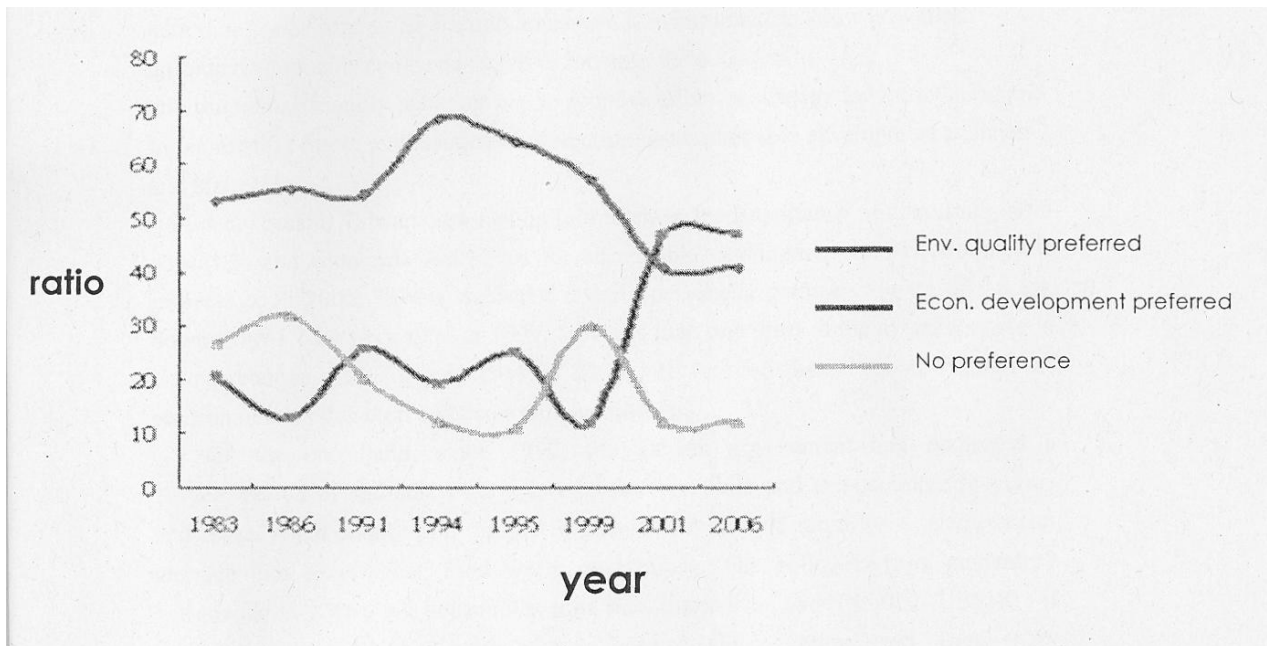
The efforts of environmental education in Taiwan have many demonstrable results. For example, the 2006 Taiwan environmental awareness survey presents a huge improvement in environmental knowledge and awareness among the general public comparing with the result obtained from the 1986 survey.

## **2. Environmental education does not guarantee environmental behavior**

However, enhancing environmental perception, awareness and knowledge through education alone does not guarantee environmental-friendly behavior. Two observations can be provided as the evidence.

First, many Taiwan's college students who have learned a lot in environmental protection and sustainable development through their 12-years' pre-college education do not behave environmental-friendly. For example, it is commonly found that many college students living in dormitories with a fixed fee do not turn off lights, air conditioning or personal computers when these facilities are not in use. However, they are more likely to save energy by turning off those appliances not in use if they have to pay for electricity and water charges at home or dormitory. This example suggests that the long-term environmental education does not guarantee the establishment of intrinsic motivations (public spirit and civic duty) for environmental-friendly behavior, or the establishment of intrinsic motivations itself is simply insufficient to lead to conservation actions.

Secondly, surveys of investigating whether economic development or environmental protection is more important to the general public have been conducted annually in Taiwan. The surveys show more than 50% of the general public weights environmental protection over economic growth before year 2000 with its peak in 1994 (see the graph below). However, a sudden declination took place after 1999 and economic development took over as the more important issue. It is likely due to the financial crisis in Asia in 1997 and the economic recession in Taiwan after 2001, which suggests that the choice between environmental protection and economic development relies fundamentally on the overall economic status.



### 3. Reliance on environmental education and supplemented with economic incentives is the path to induce environmental-friendly behavior

An individual decision-making often depends on both internal/intrinsic factors, e.g. the knowledge and attitude, and external/extrinsic factors, e.g. incentives built in an institutional design. According to the attitude theory, the behavior of people is dependent upon many variables such as perception, awareness and knowledge, affects and values, sense of civic duty and public spirit, social trust, social pressure, economic incentives, and social economic status variables (education, income). These attitude components can be classified as either extrinsic or intrinsic motivations for human behavior. Affects and values, and sense of civic duty and public spirit are intrinsic motivations which can be reduced or increased by many extrinsic components. On the one hand, environmental education may enhance environmental perception, awareness and knowledge which in turn build up environmental affects and values, and sense of civic duty and public spirit for the environment and sustainable development. In the end, environmental-friendly behavior may be induced. On the other hand, economic incentives, if properly designed, are able to strongly enhance behavior compatible with environmental protection and sustainable development too.

Thus, both education and economic incentives are needed to increase the adoption of environmental-friendly behavior. It is important to know how these attitude components can be designed to increase the adoption of environmental-friendly behavior and to propose effective strategy for formulating and implementing future environmental protection and sustainable development policies and strategies.

A successful Taiwan case can be told to show the importance of combining both education and economic incentives for sustainable development and environmental protection. In 2006, Taiwan achieved a daily per capita garbage volume of 0.6 kg, down

from 1.1 kg per capita in 1997; It is less than one third of the average waste in U.S. urbanites (2.1 kg per day in 2006). It resulted from a combination of environmental education and economic incentives.

On the one hand, since 1990, the Taiwan government had dedicated a 15-year-period of sporadic efforts to educate the public and to encourage recycling and reuse. A ten-county pilot project was launched in 2005 requiring citizens to sort garbage into recyclables, food waste, and refuse. The policy became mandatory nationwide in 2006, and households now face fines of up to NT\$6,000 (US\$181) if caught mixing recyclables with household trash. On the other hand, Taipei City, government introduced the economic instrument of per-bag trash collection fee in 2001. Citizens are required to purchase government-issued trash bags at convenience stores and supermarkets. The bags are priced above generic brands to cover the cost of pickup and as an incentive to discard less garbage in favor of recycling. Only city-approved trash bags will be accepted by local trash collectors, which also help to identify potential recyclables through its translucent plastic. The fee has reduced daily domestic waste in the city by one-third and increased recyclable garbage collection three-fold.

Education alone is not enough. In order to induce environmental-friendly behavior we need both education and economic incentives, along with many other attitude components, such as social pressure.

### **Education and Sustainable Development**

The names of your fellow panellists are set out below. You can find their CVs and photos on the Forum website, at [www.oecd.org/2008](http://www.oecd.org/2008) under the heading "Speakers".

**Moderator: Asit K. Biswas**, President, Third World Centre for Water Management

**Francisco J. Lozano**, Co-ordinator, Sustainable Campus Programme, Tecnológico de Monterrey, Mexico

**Hideaki Oda**, Councillor to the President, Japan Water Forum, Japan

**Bernard Ramanantsoa**, Dean, HEC, France

**Daigee Shaw**, President, Chung-Hua Institution for Economic Research, Chinese Taipei

**Dennis Tirpak**, Associate, International Institute for Sustainable Development

**Thierry Touchais**, Executive Director, International Polar Foundation

## **Issues for discussion:**

Information and knowledge are critical to achieving the goals of sustainable development. In this context many organizations are involved in education and information dissemination on sustainable development issues.

Schools increasingly teach sustainable development; indeed, a recent OECD study found that 69% of 15-year-olds are thinking about sustainable development issues, and the OECD is currently looking at how sustainable development is taught in schools.

With the rise of corporate social responsibility as a key element for businesses, business schools and universities increasingly include sustainable development in their programmes. This often goes beyond teaching sustainable business models to working on a sustainable campus.

International organizations such as the OECD, governments, environmental organisations and the media are also active in disseminating information on sustainable development. The OECD produces an annual report that brings together the results of its work that contribute to sustainable development.

Quality control of "green" initiatives is also increasingly becoming an issue, to ensure that sustainable development initiatives are genuine and that the term is not being used fraudulently by "greenwashers" to win over customers.

## **Key questions**

- To what extent can better informed stakeholders contribute to sustainable development?
- How effective are existing education and information dissemination activities, and how can they be improved?
- How to ensure that sustainable development initiatives are genuine and not "greenwashing"?