KORAT SUSTAINABLE AND HEALTHY CITY PROJECT

PURPOSE

This case study examines the social, economic and environmental dimensions which need to be considered in pursuing sustainable development at a local level in developing countries. Using the Korat Sustainable and Healthy City in Thailand as an example, course participants will learn about the challenges of increasing awareness on environmental issues at the local level – in our towns and cities – and about innovative and proactive planning responses which can be applied to translate heightened environmental awareness into positive action. Particular attention is given to the benefits of promoting grassroots involvement in planning and implementation of local environmental initiatives to ensure their long-term sustainability.

ETP1 COURSE TOPIC COVERAGE:

- SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL AWARENESS
- INTEGRATED RESOURCE AND ENVIRONMENTAL MANAGEMENT (IREM) CONCEPTS AND BENEFITS
- BARRIERS TO IREM
- DEVELOPING EFFECTIVE IREM IN THE MRB
- IREM POLICY INSTRUMENTS
- IREM PRACTICAL TOOLS FOR IMPLEMENTATION

ISSUES

Specific issues highlighted by this case study are:

1. Differences in sustainable development precepts at the local compared to the national or global levels
2. Challenges of implementing Agenda 21 to improve the quality of life while protecting the environment in local communities
3. Environmental awareness and the need for education in promoting sustainable development
4. Grassroots involvement and participatory approaches to environmental management and planning

LEARNING OBJECTIVES

On completion of this case study, participants will be able to:

- Identify links between global development and environmental and human heath issues faced at the local level
- Detail and discuss aspects of urban development which cause environmental degradation and a reduction in the quality of life for city residents
- Provide examples of daily unsustainable activities or actions by city residents

- Identity factors which contribute to individual unsustainable activities or actions
- Comment on the relative ranking of environmental and human health issues in terms of priorities faced by city residents
- Outline the roles and responsibilities of government agencies and other stakeholders in responding to environment and health issues
- Suggest initiatives which can be implemented at the local level to address environmental and health issues
- List necessary steps in planning and implementing sustainable development initiatives
- Describe how best to evaluate or measure the success of local sustainable development initiatives
- Identify possible limitations of local sustainable development
- Give an example of a local sustainable development initiative in their own country

PROJECT SUMMARY

Background

Launched in February 2000, the Thai-Swedish Cooperation Program on Agenda 21 (Local Agenda 21) is a two year program being delivered cooperatively by the Thai Department of Environmental Quality Promotion (DEQP) under the Ministry of Science Technology and Environment, and the Swedish International Development Agency (SIDA). The overall aim of the Local Agenda 21 program is to promote sustainable development in Thailand in a manner that ensures the quality of life for present and future generations in accordance with Agenda 21 adopted at the 1992 Rio Conference.

The Local Agenda 21 program is being conducted at two representative project sites, namely Nakhon Rachasima (Korat) municipality and Trang municipality. Korat, in the northeastern region of Thailand, is a large urban and industrial centre. In contrast, Trang is a smaller, less industrialized city situated along the coastline of the southern peninsula of Thailand.

The pilot projects being undertaken in Korat and Trang are intended to be the frontrunners for implementing local Agenda 21 in other Thai cities by demonstrating the potential to achieve sustainable development through involvement of all levels of communities in raising environmental awareness and implementation of activities to protect the environment and improve the quality of life. The Local Agenda 21 program provides support on two levels: first in advising on the implementation of local sustainable development activities in the two pilot cities; and second, to subsequently disseminate these city's experiences to other Thai cities. To this end, the program is developing national level guidelines,

information materials, and other instruments in support of local Agenda 21 in Thailand and providing support for environmental education, and local environmental conservation and protection projects.

State of the Environment Report for Korat

Introduction

Nakhon Rachasima, popularly known as Korat, is an ancient city situated in the Korat Plateau approximately 250 km northeast of Bangkok. The city lies along the banks of the Lamtakong River which runs through the southwest corner of a vast low lying plain (i.e., the elevation is 175-185 m above sea level).

Korat is a 333 year-old city which was historically important as a military centre in northeastern Thailand. The current city, located 31 km southwest of it's original site, is considered the gateway to the region and is a thriving commercial, industrial, education and transportation hub. The city has grown rapidly, expanding from approximately 4.4 km^2 in 1982 to its current area of 37.5 km^2. The city is characterized by urban sprawl to accommodate its large population – the registered population in 2000 was 173,526 people with a population density of approximately 5,000 persons/km^2. Population statistics summarized in the following table indicate that the population has actually decreased by 15% over the last 10 years. The city's non-registered population is estimated to be almost 16% of the registered population. An additional 100,000 people use services within the municipality area by day before returning to their own communities at night.

YEAR	POPULATION			HOUSEHOLDS	FAMILIES
	Total	Male	Female		
1991	204,645	104,302	100,343	49,861	35,095
1992	206,104	104,896	101,208	51,501	35,684
1993	206,956	105,033	101,923	52,920	35,410
1994	206,212	104,465	101,747	54,662	35,095
1995	187,844	87,437	100,407	56,678	34,737
1996	187,021	86,807	100,214	58,355	34,902
1997	175,420	84,526	90,894	60,517	35,237
1998	176,497	84,791	91,706	61,206	35,180
1999	173,350	83,263	90,087	61,338	35,168
2000	173,526	83,094	90,432	55,935	31,566

Korat has a diversified economic base, comprising commercial and service sectors, concentrated in the city centre, and the industrial and agricultural sectors. Agriculture is primarily occurring in an outlying area of the city north of the Lamtakong River. In excess of 400 factories are scattered in and around the city – including both large factories producing textiles, plastics, and electronics and a large number of small and medium-sized enterprises (SMEs) involved in food making (e.g., sausages, noodles, fish or pork balls, ice-cream), metal fabrication, and automotive repair.

Environmental, human health and quality of life issues resulting from development activities in Korat are reviewed in the following sections.

Water Pollution

Decreased water quality in the Lamtakong River has resulted from domestic and industrial waste water loadings to a 9 km-long stretch of this river contained within Korat municipality. Domestic discharges from households and commercial shop houses are collected to sewage canals which subsequently discharge to the river proper. Approximately 800 households are also built directly along the river bank and discharge waste water directly to the river.

Available water quality data for sampling stations upstream and downstream of the city show that organic content has increased by 20%, nitrogen by 130% and phosphorous by almost 300%. Organically bound chlorine also increased by 20%. Heavy metal levels in river water samples were variable, with none of the concentrations exceeding the Thai criteria for drinking water. An observed increase in lead concentrations is attributed to a combination of road run-off and discharges from battery factories. Seasonal differences in water quality are observed with the highest contaminant levels occurring during the dry season when discharges from the Lamtakong dam are lowest.

Prior to 1988, approximately 32,151 m^3/day of combined storm water and waste water from Korat municipality was discharged untreated to the Lamtakong River. Subsequently, a waste water treatment system was constructed to provide primary treatment using stabilization/oxidation ponds and aerated lagoons. Although the present system provides better treatment it is only capable of treating 60% of the municipality's combined waste water.

Solid Waste Management

The comparatively large population of Korat municipality and associated large service and industrial sectors generates a substantial volume of solid waste. This creates two distinct problems: (i) a lack of cleanliness around the city; and (ii) solid waste disposal.

Aesthetically unpleasing accumulations of garbage around the city have resulted from indiscriminate littering by the city residents and workers commuting to the city from surrounding areas (i.e., regulations against littering are generally ignored).

Approximately 189 tonnes of solid waste are generated each day in Korat municipality. Collected waste is currently disposed of to an open landfill located on the city's outskirts. Characteristics of Korat's solid waste are summarized in the following table.

MATERIAL	PERCENTAGE
Plastics	21%
Paper and cardboard	6%
Textiles	1%
Organic	70%
Metals	1.5%
Glass	1%
Others (stone, porcelain, etc.)	<0.5%

The landfill is located at the former waste water treatment oxidation ponds of a starch factory and has an area of 302,000 m^2. In addition to the 180 tonnes of domestic waste, another 20 tonnes of industrial waste are land-filled each day. On-site management of solid wastes first involves sorting by scavengers followed by regular covering of waste layers with soil. The pit lacks an artificial lining but the underlying ground is considered fairly non-permeable (i.e., permeability 10^{-7} m/s). The groundwater level under the landfill is at a depth of approximately 30 m. Leachate from the site is contained in 7 m deep waste pits for evaporation. Following heavy rain events, water accumulations are pumped off to additional pits to prevent overflow. No leachate is known to leave the landfill.

Traffic Congestion

High traffic volumes in the narrow streets of the city are contributing to reduced air quality. More than 200,000 vehicles crowd each day into the urbanized area of Korat discharging large amounts of exhaust emissions. At present, there are no regulations to reduce automobile usage in the city.

Steps Towards Sustainable Development

Since 1998, two major initiatives have been initiated in Korat municipality to improve the quality of life for city residents by adopting more sustainable development practices. Progress to date on these initiatives is summarized briefly as follows.

The World Health Organization (WHO) funded Healthy City concept was introduced in Korat in 1998 under the direction of the Thai Department of Health (DOH). Priority objectives of the Korat Healthy City initiative were: (i) to strengthen collaboration among interested parties, particularly the numerous government agencies located in Korat, in improving the quality of life in the city; and, (ii) to target priority areas such as main roads and pavements, green areas, recreation and sport areas, institutional buildings, working places, schools, public places and slum areas for action. To facilitate improvements to these priority areas of the city, corresponding Working Groups were set-up and given responsibility for formulation and coordination of action plans in their respective areas. The next phase of the initiative involved establishing partnerships among stakeholders, especially with local communities, and the formation of a network to implement action plans.

Since 1998, the Korat Healthy City initiative has progressed well. Reflecting the resonance of the project objectives among the city's population, the project was renamed to Mueng Khun Ya Na Yoo, which means Livable Grandma City. Collaborative efforts among the various stakeholders have proved effective. For example, the Korat municipal government has changed from working alone to coordinating their efforts with other enabling agencies and working closely with the local community. Within 3 years of the initiative's inception, a total of eleven working groups have been set up to address priority issues as identified by city residents and other stakeholders.

Another important step towards sustainable development in Korat has been the city's involvement a pilot project under the previously discussed Local Agenda 21 program. The two programs have different but complimentary objectives: the Korat Healthy City initiative focusing on livability issues in the city while the Local Agenda 21 program focuses on the larger challenge of finding ways of developing the local economy without further destruction of the environment. A common element to both initiatives is that they seek to work collaboratively with the municipality, non government organizations as well as the business sector in a participatory process towards sustainable development.

The Local Agenda 21 program has only recently got underway following discussions between the Korat municipality and the Thai DEQP in late 1999. To date, good progress has been achieved, in large part due to the dynamic and cooperative management framework established under the Korat Healthy City initiative. The Korat municipality, in collaboration with other government agencies, has been working closely with the local community to set up working groups and assign responsibilities to address priority sustainable development issues in the city. Ongoing sustainable development activities in the local community, as coordinated by the six working groups established under the Local Agenda 21 program in Korat, are summarized in the following table.

WORKING GROUP	RESPONSIBLITIES/TASKS
State of the Environment (SOE)	The responsibility of the SOE working group is producing environmental status reports on green areas, water resource, solid and liquid wastes, air quality, the community, and art and culture. Other working groups use this information in planning and evaluating their own activities.
Waste Water	The main tasks of the waste water working group are liquid waste management planning and rehabilitation of the Lamtakong River. Weekly activities conducted along the river include picking up solid waste, cleaning canals, culling branches of trees, and digging grass around the canals. In addition, the working group is trying to improve water quality by encouraging people to use simple waste water treatment systems in the community including construction of waste water treatment systems for schools.
Solid Waste	Responsibilities of the solid waste working group include: – Planning a new solid waste management system in consultation with stakeholders and the local community – Starting a planning process to select the best location for a new sanitary landfill in the city – Starting pilot projects in communities and schools to sort waste at source, recycle and compost organic waste, and creation of recycling links between communities, waste dealers and the municipalities – Inventorying, collection and safe storage of hazardous waste – Educating local people about other sustainable community activities such as composting
Energy Efficiency	Responsibilities of the energy efficiency working group are to: – Formulate a plan for a sustainable energy system in Korat – Complete energy audits for all major government buildings operated by the municipality – Initiate pilot projects to increase energy efficiency in municipal building, business, communities and hotels – Start pilot projects to promote the use of solar energy for heating tap water in schools, hotels and homes
Green Area	The green area working group is responsible for undertaking activities to improve and expand parks and recreational areas in the city
Bike Lane	The bike lane working group is responsible for: – Building bike lanes along the moats and connecting them to municipality roads – Installing sign posts for all bike lanes – Installing bike parking in the municipality area – Promoting use of bikes by city residents

SITE VISIT METHODOLOGY

Course participants will have the opportunity to learn more about various local sustainable development initiatives being undertaken in Korat during a site visit to the city. The expected duration of the site visit is two days. During the visit, participants will be expected to collect supplementary information through observation and semi-structured interviews with project representatives and local people

Participants will be organized into small groups for the site visit with each group being assigned specific tasks as shown in the following table.

SUBJECT	FOCUS
Solid Waste	Identification of solid waste related environmental concerns Environmental receptors at risk Source identification and waste characterization Proposed improvements in management of the city's solid waste Community involvement in planning and implementation
Waste Water	Assessment of water quality in the Lamtakong River Environmental receptors at risk Source identification and waste characterization Proposed improvements in liquid waste management and treatment Community involvement in planning and implementation
Health and Quality of Life	Quality of life indicators Links between environmental degradation and human health Potable water and air quality Demographics and local communities at risk Policy and planning responses
Transportation	Environmental problems related to transportation Characterization of urban vehicle use and traffic patterns Potential mitigation measures to reduce tailpipe emissions Alternative means of transportation in the city Urban policy options and regulatory responses Community commitment to planning and implementation

On completion of the site visit, small groups will be asked to present their findings to the class with emphasis on practical lessons learned by participants which reinforce sustainable management, environmental awareness and IREM theory taught in the course.

TAKE HOME MESSAGES

Anticipated lessons learned by course participants in completing the case study and site visit might include:

1. Heightened environmental awareness among individuals, industry and governments concerning the effects that their everyday actions are having on the environment is an essential first step towards sustainable development.

Until people recognize that they are part of the problem it is difficult to convince them of the need to modify their behavior in responding to sustainable development challenges.

2. Effective involvement of local communities in the planning and implementation of local sustainable development initiatives is critical to their long-term success. Unless activities are meaningful to the community (e.g., they address well-defined problems and priority issues) and achieve readily-observable results, it is unlikely that local people will 'take ownership' of the activity and continue their commitment once the initial enthusiasm for the project subsides.

3. Achieving effective coordination and collaboration – necessitating a willingness to work together and 'pool resources' – among responsible government agencies and other interested parties is fundamental to the successful implementation of integrated responses to environmental management issues.

4. Local sustainability initiatives should not be burdened with unrealistic expectations that they can resolve all the problems facing communities. Recognizing that many external factors contribute to environmental problems faced by local communities, reinforces the urgency of addressing sustainable development issues at local, national and international levels as well as at the local level.

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