



Representatives of stakeholders conducting site selection for urban greening

# ICM Solutions

## Expanding Green Spaces for a Healthier City: A Pilot Project in Da Nang, Viet Nam

- The expansion of urban spaces has generated considerable economic benefits for Da Nang City, Viet Nam. However, rapid urbanization has its downsides. The green areas of the city have been reduced, leading to a series of socioeconomic and environmental impacts, including loss of landscape, increased energy consumption, and increased vulnerability to typhoons.
- An urban greening project has demonstrated a number of early benefits in Da Nang as a consequence of restoration and recovery of green space, including:
  - improvement in the landscape and the aesthetic appeal of the city providing more areas for relaxation and recreation for the residents;
  - enhanced volunteerism of the various sectors of the community, including industry, in urban tree planting;
  - improved technical capacity in planting technologies of the agencies responsible in urban greening; and
  - broadening of ecological awareness among the citizens of Da Nang.
- Ultimately, as Da Nang becomes greener, it will create a more attractive place for people to live, work, and invest in, which in turn will enhance the potential for job creation, inward investment, and economic growth.



## VISION – DA NANG COASTAL STRATEGY

*“A coastal area of rapid and diversified development, with green, clean, beautiful environment; where the natural resource system is under long-term planning and sustainable use; where the ecological, cultural, and historical values are preserved; where the Da Nang people are provided with maximum benefits while the ecological values are maintained; and where Da Nang shall spearhead Viet Nam and the Region towards sustainable development.”*

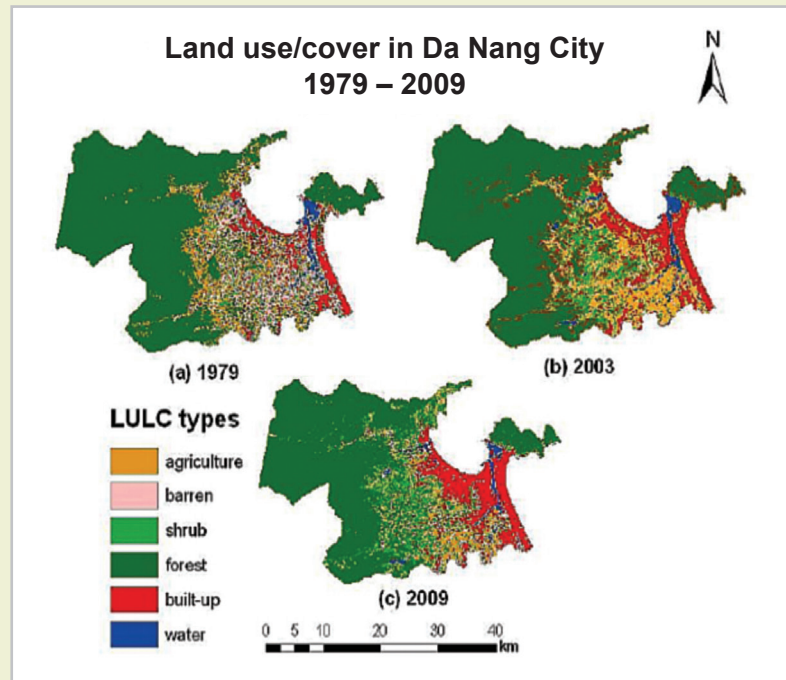


Figure 1. Land use/cover map of Da Nang City, 1979 – 2009 (Linh et al., 2012).

## Context

The GDP growth rate of Da Nang for the period 2002-2012 was 12.53%, making it one of the fastest growing cities in Viet Nam. Urbanization and industrialization over the past decade have decreased the land use area for forestry and agriculture. Natural disasters that struck Da Nang in the past have also caused destruction and uprooting of trees and vegetation, and aggravated soil erosion.

To address the above issues and in line with the long-term vision of the city for sustainable development, Da Nang implemented several programs to protect the environment while allowing industrialization and modernization process to proceed. These included:

- raising public awareness and responsibility for environmental protection;
- implementing environmental protection programs in the industrial sector, and urban and rural areas;
- protecting natural resources and landscape, and conserving biodiversity;
- improving environmental management policies and mechanisms; and
- promoting scientific research and technology transfer, and human resources training on environmental protection.

The Master Plan on Socioeconomic Development of Da Nang City Towards 2020 calls for the expansion of the urban green space, which requires planting of trees and plants in parks, sidewalks, schoolyards, and playgrounds, including residential areas and industrial parks. The city targets expanding its green spaces to cover 9-10 m<sup>2</sup>/person by 2020.

The identified green space target is designed to achieve the long-term vision of Da Nang as embodied in the ICM Coastal Strategy, which was approved on 26 December 2001 by the People's Committee. It also supports the transformation of Da Nang into an Environmental City by 2020.

As part of its ICM program, Da Nang implemented a project on Building a Pilot Model of Urban Greening (2007-2009). With financial support from the GEF Small Grants Programme and in cooperation with PEMSEA, the demonstration aimed to establish a socialized model for planting, tending and protecting trees to increase urban greenery, and raising awareness and technical competence of responsible agencies and the local communities using the following steps:

**Build “greening the city” into the local bureaucracy.** Greening a city involves the cooperation and collaboration among many different sectors. In Da Nang, leaders from all governmental levels (i.e., city, districts, and communes) fully supported the project, especially in mobilizing people to actively participate in the project activities. A Project Executive Board was set up, composed of representatives from the Department of Natural Resources and Environment, Department of Construction, and the Association of Nature and Environmental Protection. The Board is responsible for developing the urban greening plan and overseeing its implementation. Under the Board, five multisectoral technical units were operationalized (fig. 2), namely:

- I. **Planning and Planting Trees:** comprised of experts from the Department of Construction. The unit is responsible for planning the planting, organizing the locations for planting, choosing the types of plants suitable

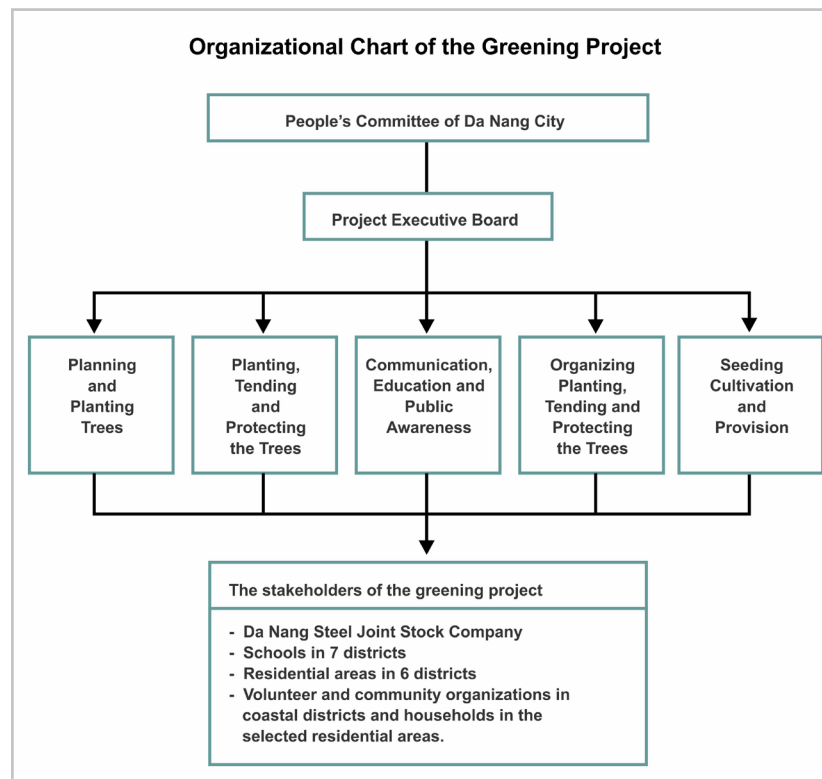


Figure 2. Organizational Chart of the Greening Project.

for each location, and ensuring the development of the area to meet the targets of 4 m<sup>2</sup> green area/person and 9-10 m<sup>2</sup> green area/person for 2015 and 2020, respectively.

2. **Planting, Tending, and Protecting the Trees:** consists of experts from the Association of Nature and Environment Protection, Department of Agriculture and Rural Development, and Tree Company. The unit is responsible for conducting training and providing guidance in the application of technologies on planting, caring of, and protecting the trees.
3. **Communication, Education, and Public Awareness:** conducts trainings on the role and the benefits of urban greening and sanitation, raising public awareness on planting, and caring and protecting the trees.
4. **Organizing Planting, Tending, and Protecting the Trees:** develops the urban greening plan and ensuring that the technical requirements are met, in providing guidance in the application of techniques of planting, providing seedlings to organizations and community groups through contracts and agreements, and in conducting monitoring and evaluation of the results.
5. **Seedling Cultivation and Provision:** consists of the Da Nang Tree Company and agro-forestry households that are tending seedling gardens. This unit is responsible for the providing various kinds of seedlings and ensuring their quality.

**Select appropriate locations and tree species.** Trees bring a number of benefits to the urban landscape, and they undoubtedly improve the quality of life for those living around them and those who come into contact with them as part of their daily lives. However, inappropriately sited trees, together with poor species selection, can lead to conflicts of interest that may result in the trees' removal.

In Da Nang, locations selected included major streets in six districts, schools in seven districts, residential areas in six districts, the coastal road, and the industrial park. When looking for a site to plant trees, a number of factors need to be considered. Primarily one has to remember that the site has to be able to support a tree throughout its life, and there needs to be enough space for the tree to grow without causing a nuisance or obstruction. Designs were developed for each location, taking into consideration the soil properties, landscape and available trees, existing infrastructure, and the suitable tree species. The designs were submitted to relevant agencies (i.e., authorities responsible for streets; schools; residential; roads and industrial parks) for final review, recommendations and approval.



*Tree planting along the coastal road.*



*Tree planting along the vicinity of a steel company.*



*Tree planting in a schoolyard.*

Some of the considerations in terms of tree species included:

- Trees selected for the schools:
  - Evergreen with broad foliage, long life (over 50 years);
  - Column stem, stratification over 3m tall, without hollow tree trunk disease and without thorns;
  - Tough branches, not easily broken;
  - Leaves, flowers, and fruit-bearing without poison; and
  - Deep tap-roots that do not resurface on the ground.
- Trees selected for the streets, residential areas, and the coastal road:
  - Large and medium with long life (over 30 years);
  - Evergreen tree with large foliage for better cooling effect;
  - Branches not easily broken, without hollow tree trunk disease;
  - Stems without thorns, flowers, leaves, fruits that are non-toxic;
  - Flowers and fruits do not host insects and pests that are harmful to humans; and
  - Adaptable to Da Nang's climate.

**Identify and engage the stakeholders.** The stakeholders of the greening project included the workers from Da Nang Steel Joint Stock Company, pupils from the schools where the tree planting was undertaken, volunteer and community organizations in coastal districts, and households in the selected residential areas. These stakeholders participated in planting, caring for, and protecting the trees.

To help the communities, including students, teachers, and the staff of related sectors and organizations to better understand the benefits of the urban greening project, including the role of plants in the environment, the regulations on tree management, and the tree planting and tending techniques, a number of communication activities were implemented, including:

- dissemination of information on the tree models and the benefits of tree planting;
- dialogue to enhance public consciousness on tree planting and protection;
- introduction of regulations on tree management and banned actions in urban greenery;
- training and transfer of knowledge and techniques on tree planting; and
- dialogues on urban green management.

**Implement tree planting, monitoring, and maintenance.** The Project Executive Board in cooperation with stakeholders oversaw the implementation of the urban greening plan that spelled out the duties of the parties involved, time and place of execution, preparation of equipment, instruments and seedlings, and other necessary logistics.

The Project Executive Board was responsible for providing trees, fertilizers, and technical assistance, while the schools and related parties were responsible for planting in accordance with the technical procedures.



*Training for residents on planting, tending and protection of trees.*

The stakeholders involved consisted of pupils and teachers, members of the youth union and women's association, ex-servicemen, and workers/gardeners. The pupils of Grades 4-5 were assisted in planting by other related stakeholders.

After the completion of planting, the related parties signed commitments on caring and protecting the trees in accordance with the procedures provided by the project, making sure that 100% of the trees will survive. Tending the trees, which includes regular watering, fertilizing, pruning, and preventing disease was assigned to the respective units. This type of maintenance is critical for at least the first two or three years while the tree gets established. The idea to foster local "ownership" of the planting as local people can be important eyes and ears during the establishment phase of the project.

Technical experts of the Project were responsible in supervising the planting and tending of the trees at each location, and in detecting violations and recommending solutions to identified problems. The monitoring is conducted randomly at least once a week for each location. The technical experts also measure the height and stem diameter of the trees, and overall tree health. The data were encoded, regularly updated, and analyzed using management software. Quarterly reports on the results and status of the models and tree growth were prepared and submitted to the People's Committee and Global Environment Facility – United Nations Development Programme (GEF-UNDP) Small Grants Program (SGP), the project sponsor.

## Results

**Increased green spaces with anticipated recreational, aesthetic and ecological benefits.** In 2006, Hurricane No. 6 (Xangsane) hit Da Nang, injuring people and destroying thousands of homes. A large number of trees in the urban areas were destroyed: 1,728 trees were uprooted; 1,627 trees were heavily damaged; and 5,123 trees were broken down. In the garden park, 948 trees needed to be cut down.

Aggregating the tree cover in the parks, offices, and schools, the average tree cover reached only 2 m<sup>2</sup>/person. If compared to the standard urban tree cover (i.e., 5 m<sup>2</sup>/person for over 20,000 people), the green cover of Da Nang is still very low. Nowak, et al., (1996) define "urban tree cover" as the proportion of area, when viewed from above, occupied by tree crowns.

Through the urban greening project, over 20,000 trees were planted in 23 different locations. Survival rate of planted trees, particularly in schools was 100%. In the coastal road, two hectares were covered with an estimated 850 coconuts. Layering of trees in the coastal areas were undertaken to protect the shoreline from strong winds and storm surges.

**Enhanced awareness and capacity among the local communities and technical personnel in urban greening.**

Seventeen training courses involving more than 3,000 participants were conducted to raise awareness on the current status of green cover in Da Nang City, the ecological importance of urban green spaces, the significance of the project, planting management regulations, and more importantly, the role of the community and various sectors in the project implementation and management. Trainings on the technical guidelines on planting, tending, and protecting the trees were also conducted.

**Community volunteerism and active participation of stakeholders through a well-designed implementation plan.**

A declaration of commitment to care for and protect the trees was signed by the leaders of the communes and schools, including the Da Nang Steel Joint Stock Company.

The local government, related departments, and organizations strongly supported the implementation of the urban greening models. Implementation of activities of the project was well organized where the different stakeholders mobilized and participated actively.

Although the duration of the project (i.e., three years) is a relatively short time to show significant results, particularly in monitoring the growth and survival of the trees, the initial results have provided the impetus for People's Committee to direct related departments and organizations to develop projects on socialization of planting, tending and protecting the trees to cover the whole city.

The project has also instilled the spirit of volunteerism among the people. Similar activities in the past have been fully subsidized by the government. The awareness raising activities have contributed significantly in changing the mindset of the people.

An efficient management mechanism for urban greening. Implementation of the model required the participation of various sectors in Da Nang. The urban greening project has benefited from the experiences of the ICM program in effectively coordinating and implementing the various activities of the project. The project was able to mobilize human resources as well as materials from the districts and communes, the related agencies, social organizations and industries, including the youth. The participation of the industry, which provided logistical support and contributed financial resources, is an area needing expansion to help sustain the initiative.

## Lessons Learned

**High-level of commitment:** The Master Plan on Socioeconomic Development of Da Nang City Towards 2020 was the trigger that set out the objectives for greening the city. The high-level plan ensured efficient coordination among sectors and mainstreaming of sectoral action plans that impacted the urban greening initiative.

**Practical measures for greening the city:** Using a combined approach of interagency consultation, field assessment, and consultations with tree experts and stakeholders in selected tree planting areas, practical measures to address

the main stages of planning and development of a greening program evolved in Da Nang from early site assessment through the detailed design and monitoring stages. The main steps of the process included:

- initiating early consultation between planners and developers;
- conducting field surveys to assess the suitability of the site for tree planting, and the development and identify considerations and opportunities at an early stage;
- designing the development in selected areas, with due consideration being given to physical and environmental conditions at each location and the appropriate tree species for identified conditions;
- getting the community to be positively involved by building awareness and encouraging care and maintenance of the newly planted trees through volunteerism; and
- monitoring the newly planted areas to ensure the health of the trees and to mitigate any problems or negative impacts associated with the greening program, with a view to continually improving and expanding the program to achieve the minimum urban tree cover target of 5m<sup>2</sup>/person.

**Longer-term benefits:** The presence of high-quality green spaces in urban areas provides additional environmental and economic benefits including cleaner air and water, more attractive properties and recreational areas, and reduction of erosion and other hazards associated with typhoons and severe storm events. By conducting the planning and development processes of greening the city within the context of the broader framework of integrated coastal management, as well as promoting best practice, Da Nang City is ensuring that nature and natural processes are employed to help support a sustainable, resilient, and environmental city, in which green space is safeguarded.

#### Keywords

urban greening, resilience, waterfront development, community volunteerism, green spaces, urbanization

#### For further reading

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