

Ecological Design in Cuba - Theory and Practice

Dania González Couret

*ISPJAE, Facultat de Arquitectura de La Habana, Cuba.**

Abstract

From its original narrow meaning, 'sustainable development' has progressively acquired a wider import to encompass not just the ecological and the environmental but also the economic and the social dimensions which, in the context of the less developed countries, are of primary importance.

Given their material and technical resources and generally comfortable circumstances, academics and people in the developed countries approach sustainable development as a "cult" in which ecology remains a matter of central concern. In less developed countries, on the other hand, basic problems such as housing, food, health and education are of prime concern and sustainable development by itself is more a matter of survival than a lifestyle choice – travelling by public transport and bikes, eating organic foods or becoming vegetarians as an alternative to other possible options.

Despite the fact that there is a consensus about the necessity to reconcile economic development with the environmental concern and the demand for social equity, the economic model imposed by globalization gives economic growth prominence before integrity and equity. This study of the Cuban experience confirms the importance of an integrated approach to sustainability to include environmental safety, economical viability and social fairness. Mere social and ecological sustainability by itself is not enough; if the alternative is not economically sustainable, it will not survive.



Introduction

During the last ten years or so the word "sustainable development" has developed from the original narrow meaning into a wider concept, which includes not only the ecological, but also the economic and the social dimensions. Despite the fact that there is a consensus about the necessity to reconcile economic development with the environmental concern and the demand for social equity, the economic model imposed by globalisation gives economic growth prominence before integrity and equity. The priority given to each of the three dimensions depends on the professional discipline and the political perspective of the observer. Nevertheless - according to the widest and most complete approach - sustainable development should mean environmental safety, economical viability and social fairness. That is why ecological design is only a part of sustainable development.

Sustainability in developed and developing countries

The expansion of cities of great economic and political power was achieved by the appropriation of resources from neighbouring regions and other countries. That is the case during colonialism, neo-colonialism and, more recently, the post-industrial neo-liberal globalisation (Coyula, 1997). Hence the developed countries are the ones which bear the largest responsibility for today's

* Professor and Vice Dean, Facultat de Arquitectura de La Habana, *ISPJAE*, Cuba. Email: daniala@arquitectura.ispjae.edu.cu

environmental crisis. It was they, who imposed the model of development, which dominated during the last three centuries, a model, which has also been a major aspiration for developing countries. On the other hand, the developing countries have been victims. They need to develop, but they do not get access to the advanced and environment-friendly technologies (González, 1995).

There are different approaches to sustainable development. The developed countries - which have solved their essential problems, approach sustainable development as a "cult", a way in which ecology is a worry. In the developing countries, on the other hand, basic problems such as housing, food, health and education are imperative. Therefore sustainable development is a way to survive. It is a completely different thing to adopt certain lifestyles (for example, to eat only vegetables or to go by bike) as an alternative to other possible options in order to protect the environment. Compare this to the situation where you have to adopt a solution as the only possible one, an option that is imposed by external forces.

This situation is provocative to Third World countries. The same is true for Cuba. Solutions for sustainability could be perceived by people as "a necessary evil", as a sign of backwardness and as a temporary solution until a "true development" can be achieved (according to the Western model).

Sustainable human settlements

The built environment plays an important role for achieving sustainability. This is particularly true for urban settlements, because their scale and concentration of population make them a burden for their hinterland. The irreversible character of the urbanisation process has been recognised as desirable because of its advantages for people (despite the "urbanisation of poverty"). That is why developing "more sustainable settlements in an urbanising world" is a major goal in the Habitat Agenda (UNCHS, 1996).

Cities are huge processors of food, fuel and other goods. These processes constitute very complex metabolisms. They are artificial because they are concentrated to a small area. They consume water and materials in amounts much bigger than nature can supply and, consequently, they generate huge amounts of garbage and wastewater. Nature can not provide resources necessary to make urban life sustainable. Neither can nature dispose of the residues produced.

There is not one single sustainable urban model. According to the bio-ecological approach, the city is an ecosystem, which should improve its own organisation, and reduce its dependence on fossil fuel (instead of the sun), as a source of energy. A sustainable city must be strongly resilient and not vulnerable.

Applying the principles of natural recycling to the urban environment one may say that a sustainable city implies a circular metabolism (Yunén, 1997). This means that every output could be reused or recycled, affecting only a smaller area. Using local recycling as much as possible for water, garbage, energy and food is a way to achieve more sustainable cities and thus, a more sustainable world. It means a better use of existent abundant human resources, of the precious natural resources and of the scarce financial resources (at least in the Third World).

Another important point to take into account is the scale of the settlement. A large and differentiated city generates a great environmental burden that affects other regions. To divide

cities into smaller units is a good way to divide big problems into smaller ones and thereby solve them more easily. Some innovations, such as bicycles, urban agriculture, local economies based on small and medium enterprises, and using technologies responsive to the environment contribute to reduce the environmental burden (González, 1998; 1999). But sustainability should not only be a model to survive. It should not only be a question of stopping or going backwards.

Some basic needs will continue to worry citizens of the world in the coming century: attractive jobs, healthy food, clean water, appropriate disposition of solid and liquid wastes. Saving and reusing resources, education, health care, recreation, alternative sources of energy, efficient public transport, affordable housing, are also high on the priority list. All this has to be productive enough to feed the population and good enough to prevent migration to the cities (Coyula, 1997).

Cuban experiences of sustainable development

Since 1959, almost 30 years before the concept "sustainable development" was coined, several processes and solutions for sustainability have been developed in Cuba.

Created in 1960, the Committees for the Defence of the Revolution (CDR), organisations that gather people in the neighbourhood, had as one of their main tasks to collect recoverable materials (glass, paper, cartoon, metal) in order to recycle and thereby save money. Without precedent the CDRs have served as social mechanisms for the collection and recycling of inorganic wastes. This was done despite the fact that its motivation was economical and not ecological. In practice it has not gone beyond its educational objective to be a useful economical tool.

Actions to stop the unbalanced growth of the capital city, and to address the differences between city and countryside that started in the early 60s, are today internationally recognised as basic principles for sustainable development. Regional and urban planning activities were started, including a national system of human settlements and the creation of basic rural settlements directly related to agricultural production. A mistake made was the reproduction in these rural settlements of urban models that were neither sustainable, nor appropriate. Conceptions were applied that have impeded the natural evolution of these settlements.

Unsuccessful attempts to bring food production near the urban areas also started in the 60s. Another example is the idea of the "Havana Green Belt", which was initiated to supply agricultural products to the urban population who worked on it. This experience failed because the goals were mainly educational and not economical (Barony, 1993).

During the 60s, before the Cuban building industry became occupied with heavy prefab systems, a lot of research and experiments were carried out to develop appropriate materials and technologies for mass housing based on the real possibilities and resources of the country. In this period many constructive ideas were developed, based on open, flexible and small-scale systems. Unfortunately, these studies were abandoned in the 70s, when preference was given to European high tech prefab systems. The purpose was to satisfy in a short time the massive housing demands, but the lack of sustainability became evident in the 90s, when Cuba had to continue building housing based on its own resources.

Research related to the use of renewable sources of energy had a boom in the late 70s and the early 80s, probably as an answer to the energy crisis of 1973. Since then a lot of research projects and experimental production of equipment have been developed. Many practical applications have also been carried out. One important application of renewable energy is the electrification of many isolated rural communities, mainly in the mountain regions. Here small hydropower plants, ie solar water heater systems, were installed in social buildings as hospitals and nurseries. Units for biogas production were installed in many stables for light production. The latter experiment was not successful, however, because skilled workers were not engaged.

Otherwise the development of renewable energies constitutes one of the most successful steps to Cuban sustainable development, despite the fact that there have been some failures due to remaining social resistance to these new technologies. On the other hand, these applications are not generally introduced in wider projects with an integral sustainable conception, which limits its scope (González, 1997).

The Turquino Plan

The first application of a coherent and integral sustainable development concept was implemented in the "Turquino Plan" from 1987. Then the idea of "sustainable development" had not yet been officially established. The "Turquino Plan" intended to promote social and economical development of the mountain regions in as self-sufficient ways as possible, in order to stop migrations to the lowlands. It was considered necessary to repopulate these areas because of the economic importance of some agricultural products grown there (coffee, cocoa, wood). It was also motivated by the concern for survival in case of attacks by foreign forces. Therefore the population needed their own resources and production (González, 1989).

This Plan for the integral development of the mountain regions had, among its basic principles:

- To take advantage of renewable energies and all resources locally available;
- To safeguard a local production of the major possible amount of required resources. For this purpose, not only crops and cattle areas were developed, but also industries to produce conserved food, offering new job opportunities, mainly for women;
- To recycle residues and to create feeding chains, using permaculture techniques to grow food in an intensive way;
- Alternative solutions for transportation, where animal traction played the main role as a renewable resource;
- Alternative solutions for services and facilities.

In the 90s, when the Turquino Plan should be reoriented in construction and social policy, it became evident that it had failed. The idea of "high quality" meant that the local context was disregarded. Houses were, for instance, not always locally produced. From 1990 Cuba entered a deep economic crisis as a consequence of losing its main commercial partners (East European countries). This brought about important economical and social changes that affected the whole country. Survival was to be achieved by relying on the country's own scarce material resources. Thus, instead of being an explicit goal, alternative and sustainable solutions were imposed during the so-called "special period". Among the main achievements during this period were:

- The increased use of renewable energies. Almost 100% of the energy consumed in the sugar industry have been of its own produce (sugar cane biomass).

- At least certain types of food production were incorporated to the daily urban life. Urban agriculture is today part of the urban landscape. It constitutes an important factor for community participation in the economy.
- Alternative solutions for urban transportation were assimilated, mainly at the scale of the neighbourhood. Small towns introduced a massive use of bikes and animal traction vehicles.
- Heavy prefab systems and similar projects were abandoned and substituted by lower energy building solutions based on specific projects built with locally available materials.

The economy of the country is today in a process of recovery. Therefore some of these sustainable practices run a risk of getting lost or substituted by solutions from the Western development model. The survival practices applied up to now were not the only possible alternatives, but for the sustainable experiences to survive they have to be seen as appropriate alternatives also in situations without economic crisis. For that to happen popular education is very important. Sustainable practices should be the result of conscious choices.

Cuba Solar

Cuba Solar is a non-government organisation (NGO) for the promotion of renewable energies in the country combined with social, economical and other environmental goals. It was created in 1994. Despite its short life it has made important achievements. One of the important ones is the electrification of "doctor houses", communities and schools in isolated, mainly mountainous, regions. The electrification is based on renewable energies such as hydropower and photovoltaic systems. The electrification of "doctor houses" includes a communication system between the doctors and hospital with better diagnosis and treatment facilities. The social impact of these projects is much more important than their economic and environmental ones.

Other projects of Cuba Solar intend to improve people's living conditions, mainly in isolated regions. In these areas alternative and more efficient technologies are provided, such as buildings for water pumping and cooking. We also work hard in environmental education, mainly with young people and children. For that purpose, experimental "labs" have been developed in rural schools. Several publications have been issued, including a popular magazine and a textbook for secondary schools.

Attempts at sustainable practices have not always been achieved as initially conceived. That is the case with the "ecological settlements system" related to sugar cane production. Here practical applications reduced their true "ecological" character.

Important efforts have also been made to introduce more ecological approaches in new tourist developments, mainly in the "protected areas". Unsustainable concepts still predominate among investors and public employees. There is no a proper market study to orient Cuban tourist product towards a true eco-tourism. The "Environmental Impact Law" has recently been approved and it establishes the necessity to carry out environmental impact studies as a prerequisite for approving an investment.

Restriction to real sustainable design

There are not many Third World countries, which can show similar actions for sustainable solutions, taking into account that they do not constitute isolated experiences. Nevertheless, in the Cuban experience some insufficiencies subsist, which limit the real sustainability of some of these attempts:

- Sometimes, top-down approaches are predominant and they limit active participation of involved actors from the very beginning. Such participation is essential for success.
- True sustainable solutions and processes should be specific, because they develop from inside to outside and bottom-up. However, the centralised conduction of some processes sometimes limits their success. Attempts to generalise good experiences may prevent their application.
- Decisions are sometimes based on partial analysis, without taking into account consequences that could be considered in a more integral analysis. For example, life cycle analysis is not considered in building decisions. Partial analysis could also lead to pragmatic approaches.
- The role of architectural and urban design for sustainability, energy consumption, comfort and quality of life has not been sufficiently considered (González, 1986, 1997).
- Resistance to changes is a proven fact. This resistance comes not only from the users, but also from the old institutions in charge of promoting new solutions.
- Summarising, the analysis of the Cuban experience confirms the importance of the integral sustainable approach, including its three dimensions. Neither social sustainability alone, nor ecological sustainability, is enough. If an experience is not economically sustainable, it can not survive.

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