

Chapter 1: Case studies

Evolution of sustainable project management from global agreements perspective

Sustainable development is a global problem and for this reason requires a global level of response. We cannot talk about environment protection, if the primary focus in development is on economic side, or to be precise on the profit side. Economic development which preserves nature and is inclusive, is in line with principles of sustainable development. The term 'sustainable development' is mentioned in a conference in Rio de Janeiro in 1992. It can be defined as the relationship between variable economic systems designed by the man and the ecological systems which must provide ecological balance. Without accepting responsibility for success at a micro level it is not possible to deliver sustainable development globally.

Sustainable development is one of the basic concepts of the economy of natural resources. Despite being interpreted differently in different literatures, the central place took its role in assuring the long-term perspective of mankind's survival and prosperity. Sustainable development also appears as an essential precondition and as the ultimate goal of effective organization of numerous human activities on the ground.¹

Observed in a historical perspective, the notion of sustainable development as a concept originates from German forestry. The concept points to the importance of permanent conservation of the forest fund in a way to be available for use for the next generation, too.

The term 'sustainable development' was first used in politics by Lady Barbara Ward, British a Labour and Environmental Representative in Washington in 1969 at Conference on Environment and Development.² The evolution of sustainable development can be followed through three periods:

- The period before the International Conference on the Human Environment,
- The period from the above conference to the report '*Our Common future*',
- Period after the report.

During the first period, by comparing the relationship between different religious beliefs (distinguishing the relationship to the environment of religions from the West, the East, and the beliefs the pre-industrial people of the South) and the tradition towards the environment, it can be concluded that it is all a common kind of effort to "*live in harmony with nature and society*",³ a which is also one of the fundamental principles of the concept of sustainable development. In this period, the work of T. R. Malthus was emphasized as the first to point out the boundaries

1 Nidžara Osmanagić Bedenik (2010): Kontroling između profita i održivog razvoja, M.E.P. d.o.o., Zagreb, pg. 59

2 Udovičić B. (2004): Neodrživost održivog razvoja, Kigen d.o.o., Zagreb. pg. 74

3 Dragičević M. (1997): Ekonomija i novi razvoj, Alineja, Zagreb, pg. 83

created by resource constraints, in terms of population growth. According to Riccardo, economic growth opportunities are also exhausted in the long run due to the scarcity of natural resources.

The second period begins with the International Conference on the Human Environment, which was organized by the UN in Stockholm in 1972. That year represents a kind of first step towards today's Sustainability Revolution. They took the first steps to find positive links between economic issues such as development, growth and employment, and environmental protection. The effect of the conference was visible through the establishment of numerous ecological associations and movements – the United Nations established the UN Environment Program (UNEP) with the task of encouraging partnerships and creating a platform for leadership to improve the quality of life, but not harm the natural environment.⁴

In the third period, following the publication of *Our Common Future*, the possibility of thinking about the development of the economy, but as the development of all, was derived. Since then, the concept of sustainable development has become a major determinant of international, national, regional and local development policies. This is particularly emphasized at the UN Conference on Environment and Development, better known as 'Earth Assembly', which was held in Rio de Janeiro in 1992, when several important documents were produced: Agenda 21, Declaration on Environmental Protection, The Convention on Climate Change, the Convention on Biodiversity and the Global Agreement about forests.⁵

Examples of successful sustainable management projects

Sustainable management of projects is two-dimensional process. It relates to the way the project is managed, taking into consideration all three elements of sustainable development to be in balance. However, it could also be related to the nature and goals of the projects, which if sustainable should be social, economic and environmental sustained. In this chapter, the evidence from the field – examples of the elements of sustainable development in project management all over – world are presented.

4 Majda Tafra-Vlahović (2011): Održivo poslovanje, Intergrafika d.o.o., Zaprešić, ISBN 978 953 7670 08 5 pg. 79

5 Keating M. (1994): Earth Assembly - Change Program, Popular Edition of Agenda 21 and Other Agreements

Case 1.1: Fuel from plant waste

Note: *The Project is good example how introduction of technologies and innovations in production cycle can improve both economic and social dimension of it, through resource efficiency and decreasing the level of greenhouse gas emissions.*

Dutch multinational DSM has developed a technology for converting waste and inedible parts of plants into biofuel. It has joined forces with American firm POET and is building a plant in Emmetsburg in the US state of Iowa to produce these advanced biofuels'

The use of bio-ethanol to power cars is controversial because so far the ethanol has been made from sugar and starch, which are also important nutrients for people and animals. Any competition between fuel and food could

have a negative impact on people in developing countries, in particular, as it drives up food prices. POET-DSM's Project Liberty⁶ will mainly use the waste left behind after the maize harvest – cobs, leaves, stalks and so on, as the feedstock for bio-ethanol. However, it will use only a quarter of what remains in the field after the harvest. The rest will be left in order to prevent erosion and maintain soil fertility.

After arrival at the plant, the feedstock will be finely chopped and simmered for a while in sulphuric acid solution, causing the ligno-cellulose, which gives the plant its rigidity, to disintegrate into long chains of cellulose and hemi-cellulose (polymers). Enzymes will then break these long chains into their building blocks – sugar molecules. These will then be converted to alcohol using baker's yeast. Inedible parts of plants consist largely of sugars that baker's yeast cannot normally digest. In collaboration with TU Delft and other partners, DSM recently succeeded in genetically engineering a yeast that digests not only ordinary sugars, but also 'C-5' sugars. The yeast contains a genetic property of a certain fungus. In its search for the fungus with this special property, DSM conducted a wide-ranging study of nature's toolkit, including the micro-organisms in elephant droppings.

Thanks to the specially engineered yeast, it is now technically possible and economically viable to convert inedible parts of plants into bio-ethanol. The bio-ethanol plant currently being built in Iowa will eventually produce 100 million litres a year. But this is just the first step. In ten years' time, demand for bio-ethanol is set to reach 60 billion litres a year in the United States alone. DSM believes that, by that time, bio-ethanol from inedible plant parts will be cheaper than normal petrol. This will also be good for the climate in the sense that – taking the entire production chain into account – its greenhouse gas emissions are 111% lower than those of petrol, because the process actually leads to net consumption of greenhouse gases.



6 <http://poet-dsm.com/liberty>

Case 1.2: ICSR: international corporate social responsibility

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Note: This is example of a great initiative implementing Triple P approach.

'A world to be won' was the subtitle of the Social and Economic Council of the Netherlands' advisory report on sustainable globalisation, published four years ago. One way of bringing about sustainable globalisation would be to call upon the corporate social responsibility of international companies, it said. Now, four years later, international corporate social responsibility (ICSR)⁷ has almost become commonplace.



The Council's report prompted a declaration by employers' organisations and trade unions to the effect that ICSR must be encouraged at all levels. It called upon all companies and sectors not simply to leave it at fine-sounding words, but to take genuine action. And they have. In 2010 the employers' organisations published a pamphlet presenting their vision of sustainable growth and jobs, including ICSR with a focus on the three Ps: people, planet and profit. Trade unions seized the opportunity to put ICSR on the agenda in their talks on terms and conditions. They also collaborated with civil society organisations to inform consumers about banks' investment policies, and about where clothes are made. The international trade union movement has also become more actively concerned with outsourcing and flexibilisation among suppliers in developing countries.

In recent years, an encouraging number of CSR and sustainable development initiatives have been introduced at sector level, ranging from the Sustainable Palm Oil Task Force to the Dutch Sustainable Coal Dialogue, and from the Fair Wear Foundation (for sustainably produced clothing) to the WeCycle initiative for the collection and responsible disposal of consumer durables.

Dutch companies and organisations have been putting up a good show internationally, too. The Dutch network of Global Compact, a global organisation that promotes human rights, better working conditions, environmental protection and protection from corruption, has around 70 member companies. Dutch companies lead the field when it comes to sustainability policy and reporting, as evidenced by their position in the Dow Jones Sustainability Index.

Corporate social responsibility is part of a global trend. We already have guidelines, such as those drawn up by the OECD for multinational companies; we have standards, such as ISO 26000 for corporate social responsibility; and from the United Nations we have Ruggie's Guiding Principles on Business and Human Rights (Protect, Respect, Remedy).

The SER's ICSR project shows the added value of dialogue in working out the details of ICSR. Things are progressing slowly, but the Netherlands did not create its great polders overnight. Now that the ICSR project is coming to an end it is becoming clear that the supertanker of the consensus economy is heading towards sustainable development.

7 <https://english.rvo.nl/>

Case 1.3: Energy from greenhouses

Note: *This project is an example of how negative impact on the environment can be decreased by GHG emissions reductions, and in the same time reducing energy consumption, which leads to the lower costs and higher profits at the end.*

The cultivation of flowers and vegetables in greenhouses takes a lot of energy (which currently still comes from fossil fuels), particularly for heating in winter. At the same time, all those greenhouses together form a 10,000-hectare bed of solar collectors, which capture much more heat from the sun than the plants actually need.

In summer, the windows often have to be opened wide to let out the excess heat. Dutch horticulturalists felt this was a shame, as it effectively meant throwing away huge sums of money. Some ten years ago, they got together with universities and research institutions to find a way of using sunlight (which is free of charge) to more effect. The sector has undertaken to improve energy efficiency in greenhouse horticulture by 2% a year, mainly through energy conservation and the use of sustainable resources. From 2020, new greenhouses must have zero net fossil fuel consumption. These agreements with the government have led to a wave of innovation in the sector, with researchers, horticulturalists and their suppliers working together to achieve the targets. They are looking at each part of the greenhouse, starting with the glass.

The glass for tomorrow's greenhouses is a high-tech product which looks like normal glass only from a distance. The Venlow Energy Greenhouse has a double-glazed roof with two three-millimetre panes, which makes it a good insulator. Normally, thicker glass lets less light through – which is why horticulturalists are not keen on it – but this special glass does not reduce the amount of light entering the greenhouse. It does however cut its energy needs, allowing an autumn crop of cucumbers to be grown using 70% less energy, for example.

Sunlight consists of roughly 50% light that plants use to grow (photosynthetic active radiation, or PAR) and 50% heat (near infrared radiation, or NIR). Researchers at Wageningen University have developed a glass that can separate these two light sources.



In the ELKAS the sunlight is captured by special foil suspended like hollow mirrors, which reflects only the NIR. The PAR passes through the film to the plant, which uses it to grow. The heat is reflected and focused on a thermophotovoltaic cell (TPV), which converts it to electricity.

Another new development is the Fresnel greenhouse. Using special lenses of the same type used in lighthouses (Fresnel lenses) direct sunlight is diverted to a solar cell that immediately converts it into electricity. Only the diffuse sunlight reaches the plants. Potted plants fare particularly well in the absence of direct sunlight.

The latest innovations not only involve the glass in greenhouses. Some horticulturalists use heat exchangers to heat groundwater on hot summer days and store it underground to use for heating in winter. Some also use geothermal energy to heat their greenhouses.

Technology is important, but the change in attitude in the horticultural sector is even more so. Horticulturalists are now no longer concerned only with the harvest from their crop, but also with harvesting sunlight.

Case 1.4: Pharmaccess: affordable care thanks to sustainable finance

Note: *The project is example of actions towards poverty reduction and social inclusion, providing healthcare services to everyone.*

Every year tens of millions of households fall into poverty because they face huge and often unexpected bills for medical care. PharmAccess Foundation of Amsterdam has developed an innovative approach to make medical care accessible to people in low and middle income groups in Africa, while at the same time improving the quality of care.



Ill health and poverty form a vicious circle. The vast majority of Africans have no health insurance. If they fall ill or have an accident, they have to pay all their medical costs themselves. Every year more than 50 million households face huge bills for medical care, causing more than half of them to fall even deeper into poverty.

At the same time, little is invested in private health care because doctors, midwives and hospitals have insufficient regular income to be able to borrow on the capital markets. But they desperately need money to continue providing care. Though governments and foreign donors do put money into public health care, demand still far outstrips supply.

PharmAccess⁸ and a number of partner organisations have developed a mechanism to break this vicious circle. They do so by fostering both demand for and supply of care. The Health Insurance Fund provides insurance to give people access to affordable care. People on a low income, such as market traders, smallholders and small entrepreneurs, pay a low monthly

8 <https://www.pharmaccess.org>

premium for a broad basic package of healthcare services. The Health Insurance Fund supplements the premium.

The Medical Credit Fund ensures that clinics and hospitals are able to improve the quality of their care by providing small loans combined with extensive training. Clinic owners also receive training to improve their entrepreneurial skills and ensure they meet the criteria for loans from private capital providers. The loans come from local banks, and are guaranteed by the Medical Credit Fund.

The SafeCare Foundation has developed internationally recognised care standards for small clinics in Africa. Using a detailed, step-by-step plan, the clinics can improve their services and gain recognition as providers of safe, good-quality patient care. Finally, the Investment Fund for Health in Africa invests in healthcare enterprises such as insurance companies, drug distribution companies and pharmacists, so that they too can improve and expand their services. This is one of just a few organisations in the world that provide capital for such organisations with the aim of improving the healthcare infrastructure.

PharmAccess's innovative approach of involving the private sector is receiving growing support from the Dutch Ministry of Foreign Affairs, African governments, the World Bank and USAID, companies like Heineken and Shell, and from the Rockefeller Foundation and a number of private investors. They are all active in Sub-Saharan Africa, and are hopeful of success in their efforts to break the vicious circle in health care.



Case 1.5: Cleaner laundry: saving energy and water

Note: One more example of triple P approach (people, planet and profit)

More than three-quarters of the environmental burden from detergents is caused by their use in doing the laundry – whether by hand or machine. Anglo-Dutch multinational Unilever has developed a detergent that can be used at lower temperatures, and takes less rinsing water. This not only saves water and energy, but in the case of hand washing it also saves labour.

Every year, Unilever's products are used to wash 125 billion loads of laundry, both large and small. If we look at the entire chain from raw materials to clean laundry, three-quarters of all greenhouse gas emissions are emitted by the end user: the consumer. When it comes to water consumption, the figure is as high as 95%.

Unilever has developed a fabric conditioner that removes the suds quickly so the wash requires only one rinse. This is ideal for regions that face water shortages, as it saves two of the three buckets of water needed to rinse a hand wash.

⁹ <https://www.unilever.com/sustainable-living/reducing-environmental-impact/greenhouse-gases/innovating-to-reduce-greenhouse-gases/helping-consumers-to-reduce-emissions/>

For India, this meant a saving of 14 million cubic metres of water last year. In Vietnam, where the product has also been launched, the saving was 1 million cubic metres. Another benefit is the reduction in time and energy achieved by only having to rinse the laundry once, rather than the usual three times.



In Western Europe and other regions where water for washing is not in short supply (yet), and consumers generally wash by machine, the focus is on energy saving. This has given rise to the concentrated washing detergents that are marketed under various names.

The environmental benefit of these concentrated detergents lies in the fact that the temperature of the water used – for white, coloured or delicate washes – can be reduced by at least ten degrees. Furthermore, because they are so concentrated, they require less packaging material and less fuel to transport, and that helps reduce energy consumption too.

The new detergents can by no means be called 'green washing'. As part of its sustainability strategy, it is Unilever's ambition to halve the environmental impact of its products by 2020 relative to 2008. In 2009 the company embarked on a life-cycle analysis of 1600 products, focusing on greenhouse gas emissions, water consumption and waste. It then systematically explored the best and worst case scenarios for reduction, eventually coming up with environmental action plans. All the Unilever divisions' plans together should achieve the target of halving the company's environmental impact.

Technological innovation plays a key role, but persuading consumers to change their routines is at least as important. The key thing is to find the 'sweet spot' at which customers are convinced, where both they and the environment benefit. Where they decide not to use two caps full 'because it doesn't seem like much', but one because it saves money, is better for the environment and does what it should – gets the laundry clean.

Case 1.6: Promoting green public procurement in support of the 2020 goals

Note: This is an example of how procurement as important element and process in the project management cycle can be organized in sustainable way.

In recent years, awareness of green public procurement (GPP) has increased considerably. Tools, guidance and GPP criteria are now widely available in many countries. Yet, the vast majority of public tenders in Europe still do not incorporate effective environmental criteria and do not result in the purchase of sustainable solutions.

The overall objective of GPP 2020¹⁰ is to significantly increase the implementation of GPP within the target countries both in the short and long term, through a series of capacity building and major tendering actions. The project has a total of 18 partners across eight countries – Austria, Croatia, Germany, Italy, Netherlands, Portugal, Slovenia, and Spain. This large number

10 http://www.hr.undp.org/content/croatia/en/home/operations/projects/environment_and_energy/promoting-green-public-procurement--gpp--in-support-of-the-2020-.html

of partners and wide coverage will allow the consortium to meet its aims of upscaling the implementation of GPP on a large scale and to substantially boost GPP skills and knowledge across the procurement community. The geographical coverage of the consortium will also ensure effective promotion of GPP as a mechanism to meet the EU 2020 targets and dissemination of the project results.



The specific objectives of GPP 2020 are:

- To build capacity amongst public authorities for the implementation of GPP for energy related products, services and works procurement;
- To build capacity amongst procurement training providers, to enable the integration of GPP into regular procurement training programmes;
- To achieve CO2 reductions through supporting the implementation of GPP tenders;
- To promote knowledge transfer of GPP approaches, and innovative technologies and services between purchasing bodies and GPP support bodies across Europe;
- To enhance permanent GPP support structures in the target countries.

In addition to the target groups themselves, these should be considered key actors:¹¹

- Public authority decision makers (those making high level decisions on strategy, allocation of public budgets and financial conditions, including department heads and financial officers) – the active participation and/or approval of this group is clearly key in providing an enabling environment for SPP and the systematic purchase of low carbon solutions.
- Technical departments and consultants: Procurement in the sectors of construction, energy, IT equipment for example, will likely require the involvement of different departments and staff with specific technical knowledge.
- Suppliers: Suppliers are of course ultimately those who will provide the low carbon solutions which the purchasing bodies are intending to buy. Contact with suppliers through early market engagement processes will be highly beneficial to achieving the best outcomes in tendering
- Those responsible for drafting/implementing national SPP/GPP activities: A number of organisations are already engaged to various degrees in promoting SPP/GPP in different Member States and co-ordination is therefore necessary.

GPP 2020 aimed to mainstream low-carbon procurement across Europe through the following activities:

- Project partners implemented more than 100 low-carbon tenders to achieve a significant amount of CO₂ emission reductions immediately

¹¹ <http://www.gpp2020.eu/about-gpp-2020>

- Training and networking events were provided - both for procurers and procurement training providers - on the implementation of energy-related GPP in Austria, Croatia, Germany, Italy, the Netherlands, Portugal, Slovenia and Spain
- Permanent GPP support structures were created or supported in: Austria, Croatia, Germany, Italy, the Netherlands, Portugal, Slovenia and Spain

Through this, GPP 2020 contributed to the EU's target to reduce greenhouse gas emissions by 20%, increase the share of renewable energy by 20% and increase energy efficiency by 20% by 2020. The solutions procured by the low-carbon tenders are going to emit 67,795 t CO₂eq less during the time they belong to the public authorities compared to a baseline or reference value. The CO₂eq-reductions achieved in each tender are shown here:

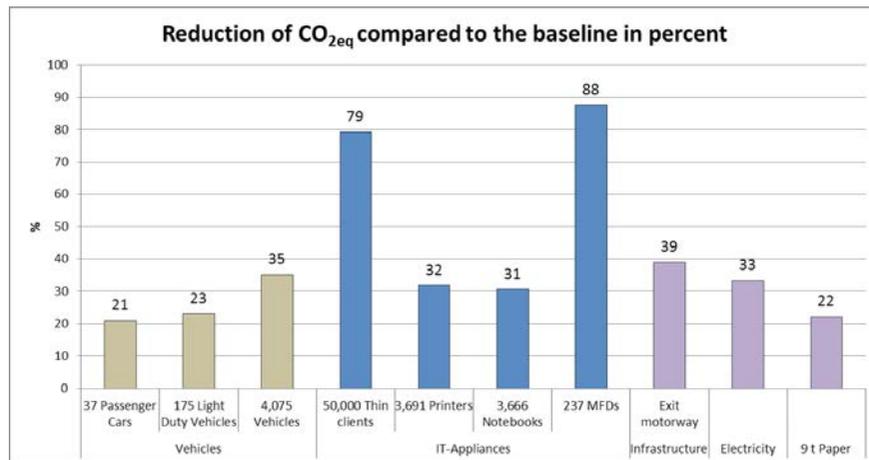


Figure 1.5: CO₂eq-reduction realised by the 10 low-carbon tenders

The highest reduction was achieved by the low-carbon tender for thin clients. This tender combined a high number of devices (50,000) with a considerable room for improvement as thin client technology replaced Desktop-PCs. Furthermore, the devices are going to be used in a country with relatively high carbon electricity.

The CO₂eq-reduction achieved by the low-carbon tenders can also be expressed in percent (ratio of CO₂eq-reduction and amount of CO₂eq of the baseline). These percentages are shown in Figure 1.5. The highest percentage reductions were achieved by the tenders for multi-functional devices (MFDs) and for thin clients. The figure also shows that in each low-carbon tender at least 21% of CO₂eq-reduction was achieved. While this is a respectable figure, it is at the same time connected to a lesson learned by project partners in the first period: that some low-carbon tenders could have been designed even more ambitious, by e. g. using award criteria on energy consumption. The market seems to be ready to provide low carbon solutions and thus, we are looking forward to seeing highly ambitious low-carbon tenders in the second and third project period.

Case 1.7: Zeeland Sole Council: farming in a salty cycle

Note: *One more application of the Triple P approach*

More than half the world's population lives in low-lying coastal areas and river deltas where – by no coincidence – the soil is most fertile. Subsidence and rising sea level are however causing that fertile ground to become more and more saline. So entrepreneurs, researchers and the authorities have joined forces to form the Zeeland Sole Council, an integrated trial farm in a saline environment.

The people behind the Council got a pleasant surprise in spring 2011. After a dramatic winter during which many fish died of the cold, they found large numbers of young sole in their ponds. The sole had spontaneously reproduced in captivity. It is barely possible to overstate the importance of this discovery. Because sole reproduces in captivity, it can be domesticated. Selection of the fastest growers will allow production to gradually increase, providing access to a viable source of protein near to a densely populated area.



Sole is only one of the products of this trial farm. The cycle begins with algae that convert sunlight and CO₂ into food for ragworm, which are popular with anglers. The algae also provide food for shellfish like oysters, mussels and common periwinkles. The ragworms provide food for the sole, and the fish produce manure that can be used to feed the algae. Saline plants like marsh samphire and sea aster, which have long been harvested in the Netherlands' delta region, also benefit from the fish manure.

Zeeland Sole Council is not the only initiative to take a creative and productive approach to the salinisation of the delta. Further up the Eastern Scheldt, at Schelphoek, there are underwater fields of kelp, a rapidly growing plant that can grow several metres high. Kelp is also edible. It is a rich source of protein, vitamins and carbohydrates, as well as being an important natural resource for the food industry, providing ingredients for margarine and toothpaste. It is also interesting for the chemical industry, and can be used in the production of plastics, for example.

Both Zeeland Sole Council's algae and Schelphoek's kelp do well in coastal waters, which are rich in nutrients like phosphate and nitrogen. There is indeed an excess of these nutrients, because large amounts run off the land. Their ability to fix CO₂ dissolved in the water also means they help curb the gradual acidification of the seas and oceans.

All told, farming at sea offers good prospects. It not only provides healthy food for nearby urban areas, if it is properly set up and conducted it can also help maintain marine and coastal ecosystems. No wonder the idea of farming in a salty cycle is attracting a lot of interest from the world's delta regions.

Other examples of sustainable project management practice

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New Amadore Apartment Window Replacement PACE Project

(<http://energyalliancegroup.org/projects/new-amadore-apartments>)

New Amadore Apartments, in Saginaw, Michigan, a 63 unit building constructed in 1929, still had all its original windows. They did not seal properly resulting in drafty conditions, and were difficult to open and close. This was the number one tenant complaint. Repair parts for these vintage windows were no longer available so total replacement was the only option. However, with \$255,000 capital expenditure required, the owner put the project on the back burner, until the Energy Alliance Group (EAG) informed him of Property Assessed Clean Energy (PACE) financing. PACE enabled him to purchase all new windows with no money down, and with a 20 year, fixed interest rate loan. EAG handled all project development work including conducting the energy audits, arranging for the financing, lining up a supplier of energy-efficient windows and providing project management support.

The improved energy efficiency reduced the monthly utility bill by \$1,065, or 31%. Total savings including utilities, maintenance and repairs, are projected to be \$315,000 in 10 years and \$610,190 in 20 years.

Crosswaters Ecolodge, China

(<https://www.edsaplan.com/project/crosswaters-ecolodge>)

Crosswaters Ecolodge, located 80 miles away from the bustling international city of Guangzhou, aimed to become the first ecolodge in China. It is located in a forest reserve covering 260 km² and is the home to more than 5,000 Keija population, 30 km² bamboo, and 1,300 plant species. This ecolodge is the first project in a 10-year ecotourism development plan in Nankun Mountain reserve. During the planning stage, the design team of the lodge conducted extensive observations and research to ensure the buildings had minimal negative impact on the environment and surrounding communities. The project featured extensive use of bamboo, a sustainable building material that grows rapidly, and is the main native plant in the region.

The Crosswaters Ecolodge has provided an excellent example of sustainable buildings/gardens and ecotourism. At the time of construction, it was the largest bamboo built commercial project. In 2010, the planner of Crosswaters Ecolodge, EDSA Inc., received the Honor Award from the American Society of Landscape Architects (ASLA) for its sustainable design and thorough consideration of all natural and social environments of the surroundings in building the ecolodge. The multi-award Crosswaters Ecolodge was the result of an International collaboration between Consultants from 5 continents with Hitesh Mehta being the Team Planning and Design leader.

Questions to think about?

What makes those projects sustainable?

Which elements of sustainability are most expressed in presented projects?

Is there anything that can be done differently or more efficient?

Think about your daily activities. What can you do to make your everyday life more sustainable?