

Chapter 2

Green Economy Set to Strengthen South-South and Triangular Cooperation

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1. Introduction and Overview

There is increasing evidence that climate change and overfishing are threatening the survival of the ecologically rich coral reefs in the Asia-Pacific,³ which in turn is having a ripple effect for the more than 360 million³ people who depend on these resources for their food and livelihoods.

To address these challenges, countries in the region have sought advice and assistance from their neighbours, as well as international donors and organizations, and formed what is now known as the Coral Triangle Initiative on Coral Reefs, Fisheries, and Food Security. The six participating countries of this initiative — Indonesia, Malaysia,



An underwater scene from the Coral Triangle

Papua New Guinea, the Philippines, the Solomon Islands, and Timor Leste — are working together to promote marine protected areas, better fishing techniques, and sustainable tourism, work that is helping to safeguard their unique marine resources and future economies.

The Coral Triangle Initiative is just one example of how the global shift to a more inclusive and resource-efficient green economy is strengthening South-South and Triangular Cooperation, and how such partnerships are accelerating the transformation to a more sustainable society.

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3. The Coral Triangle Initiative website: <http://www.coraltriangleinitiative.org>.

Whether it is a public-private initiative using the latest technologies to bring energy to the rural poor, or government-sponsored study tours demonstrating innovative strategies to promote sustainable agriculture, green economy activities are prospering as a result of South-South and Triangular Cooperation.

The United Nations system is dedicated to fostering these models of cooperation through knowledge sharing, best practices, and technical exchanges, as well as disseminating norms and standards. South-South and Triangular Cooperation often involves two or more developing countries coordinating with support or participation of a developed country or organization. As a result, developing and emerging countries in the South are creating new partnerships, capacities, efficiencies, and jobs as they develop their green economy pathways.

For example, the Global Efficient Lighting Partnership, “en.lighten,”⁴ a public-private initiative in the South, involving all sectors of society — governments, civil society, academia, research organizations, international agencies, and the private sector — is successfully promoting sustainable practices that can be shared and adopted by other developing countries.

By transitioning to more energy-efficient lighting, countries can reduce carbon emissions and save billions of dollars in energy costs. Through regional cooperation and agreements, en.lighten is stimulating information exchange and policy alignment. For example, in Latin America and the Caribbean, it is estimated that 20 countries could save up to 4 per cent of their total electricity consumption by switching to compact fluorescent lamps, which could result in USD 4 billion per year savings for consumers in energy costs or the equivalent of carbon emissions from 4 million cars.

In the Middle East and North Africa, the en.lighten initiative secured the support of 16 countries to phase out general service incandescent lighting and transition to more efficient lighting products, which could save the region an estimated USD 3 billion a year in energy costs. In Southeast Asia, it is estimated such a move could save USD 1.6 billion a year.

4. The Global Efficient Lighting Partnership website: <http://www.enlighten-initiative.org>.

Developing countries in the South are rapidly becoming major economic forces, and it is widely recognized that they have an opportunity to leapfrog their counterparts in developed countries, embracing the latest clean technologies and best practices, and avoiding investments in carbon-intensive infrastructures and wasteful production. The new green economy paradigm calls for a more inclusive and equitable society, and development cooperation is following these trends by expanding the cooperation models, capacity building, and knowledge sharing between Southern countries.

While such cooperation is not new, it is increasingly important in accelerating the greening of the global economy, as demonstrated at the BRICS Summit held in Durban in May 2013. There, Brazil, China, India, Russia, and South Africa further consolidated their economic relationship, which represents over USD 200 billion in trade value, and signalled their support for advancing toward a green economy.⁵

South-South trade represents nearly 40 per cent of global trade. Today, more than half of all developing countries trade with other developing countries, rather than developed countries, as in the past. This is a growing trend, up from 37 per cent in 2001.⁶ It represents a huge opportunity for developing countries to benefit from new and greener market technologies and production processes, which can lead to the export of high-value goods and services, while avoiding the costly import of fossil fuels to satisfy their energy demand.

Furthermore, as many developing countries still have abundant natural resources, a shift toward a green economy will help them protect the resources on which they depend for food, energy, and their livelihoods. Recognizing this link, the United Nations Environment Programme (UNEP) and China's Ministry of Science and Technology are cooperating with several countries in Africa to promote better ecosystem management. By sponsoring training, scholarships, and studies, this tripartite programme is helping key stakeholders from Burundi, the Democratic Republic of Congo, Tanzania, and Zambia enhance their capacity for monitoring the shared water resources in Lake Tanganyika,

5. Fifth BRICS Summit website: <http://www.brics5.co.za/>

6. World Bank, *Global Economic Prospects*, Vol. 7, June 2013.

which is threatened by pollution and intensive fishing.⁷

Likewise, by empowering local people, South-South and Triangular Cooperation is sparking a growing interest in sustainable development. The West African Regional Integrated Production and Pest Management Programme, which focuses on training facilitators to work with smallholder farmers to reduce their reliance on toxic pesticides, is further evidence of this approach. Coordinated by the Food and Agriculture Organization and funded by international donors, the programme has reached more than 100,000 farmers in Benin, Burkina Faso, Mali, and Senegal.⁸

Urban areas also present a challenge for South-South cooperation. The United Nations estimates that a majority of the population growth in the next 12 years will take place in developing countries. By 2050, 70 per cent of the global population will live in urban areas. Therefore, more cooperation, investment, and innovation are needed to create sustainable infrastructures that will support this growing population, including providing green jobs and sustainable transport, while using fewer resources. Because cities are centres of innovation and can be designed, planned, and managed to limit resource consumption and carbon emissions, urban areas will play a key role in the global green economy transition.⁹

As UNEP Executive Director Achim Steiner says, “Some of the most extraordinary answers and solutions to environmental sustainability and sustainable development in the 21st century are today emerging from the South.”¹⁰

Last year, the UN Conference on Sustainable Development (Rio+20) Outcome Document, *The Future We Want*, reiterated its support for such cooperation, highlighting “the positive experiences in some countries, including in developing countries, in adopting green economy policies

7. UNEP-China Africa Cooperation on the Environment brochure:
<http://www.unep.org/roa/portals/137/docs/UNEP-China%20flyer-WEB.pdf>.

8. SSC Mechanism website:
<http://www.unep.org/south-south-cooperation/case/casedetails.aspx?csno=111>.

9. UN Department of Economic and Social Affairs (2012). *World Urbanization Prospects, the 2011 Revision*.

10. UNEP (2013). Website: <http://www.unep.org/south-south-cooperation/gssd/Default.aspx>.

... and welcomes the voluntary exchange of experiences as well as capacity building in the different areas of sustainable development.”¹¹

The Rio+20 Summit also called on the United Nations to support interested countries in their transition to greener and more inclusive economies.

In response to this call for action, UNEP, together with the International Labor Organization, United Nations Industrial Development Organization, and United Nations Institute for Training and Research, created the Partnership for Action on Green Economy, or PAGE. The partnership aims to build on the existing initiatives and expertise of the four agencies to deliver a full range of integrated services and tools that will assist developing countries with their national green economy plans. This collective effort will also mobilize social awareness and training, foster policy development and implementation, and increase knowledge sharing and technological advances among developing countries.

Today, many southern countries are seizing the moment and leading the way to a green future. Their experiences and lessons to date will also be highlighted during the annual exposition on South-South and Triangular Cooperation, which is being hosted for the first time this year in a developing country — at UNEP headquarters in Nairobi, from 28 October to 1 November.¹²

Following are four examples of how UNEP is supporting South-South and Triangular Cooperation, in partnership with the public and private sector as well as non-government organisations, and targeting key economic sectors to advance the global green economy transition.

2. Case A: Creating Regional Capacity and Enforcement to Tackle E-waste in Africa

2.1 Background

In the past century, information and communications technologies (ICT) have enriched the way we live — from our health and education to our

11. United Nations General Assembly. *The Future We Want – Outcome Document*. Adopted 27 July 2012 at the 123rd Plenary Meeting, New York.

12. UNEP website: <http://www.unep.org/south-south-cooperation/>.

governments and businesses. As a result, ICT has become an indicator of a country's economic and social development. While access to ICT has not always been equitable between developed and developing countries, evidence shows that developing nations are rapidly catching up.

In Africa, the use of electrical and electronic equipment is still low compared to other regions of the world, but it is growing at a staggering pace. The penetration rate of personal computers in Africa has increased by a factor of 10 in the last decade, while the number of mobile phone subscribers has increased by a factor of 100.¹³ This demand for ICT has created new challenges, which need to be addressed and managed to ensure these countries receive the maximum benefits from this technology without causing additional threats to their environment and health.

A report by UNEP's International Resource Panel found global e-waste generation, such as dumped computers, printers, mobile phones, pagers, digital cameras, refrigerators, toys, and televisions, is growing by 20 to 50 million tons a year.¹⁴ This electrical and electronic equipment can contain hazardous substances (e.g., heavy metals such as mercury and lead and endocrine-disrupting substances such as brominated flame retardants). Hazardous substances are released during various dismantling and disposal operations and are particularly severe during



E-waste dump sites

the burning of cables to liberate copper, and of plastics to reduce waste volumes. The open burning of cables is a major source of dioxin emissions, a persistent organic pollutant that travels over long distances that bio-accumulates in organisms up through the global food chain.

13. Secretariat of the Basel Convention (2011). *Where are WEEE in Africa?*

14. UNEP (2013). *Environmental Risks and Challenges of Anthropogenic Metals Flows and Cycles, A Report of the Working Group on the Global Metal Flows to the International Resource Panel.* Van der Voet, E; Salminen, R; Eckerman, M; Mudd, G; Norgate, T; Hischier, R.

In addition, the carbon dioxide emissions from the mining and production of the rare metals used in the equipment, alone, are estimated to be more than 23 million tons each year.

Electrical and electronic equipment also contains materials of strategic value, such as indium and palladium, and precious metals such as gold, copper, and silver. These can be recovered and recycled, thereby serving as a valuable source of secondary raw materials, reducing pressure on scarce natural resources, as well as minimizing the overall environmental footprint.

2.2 The E-waste Africa Programme

In West Africa, countries lack the infrastructure and resources for the environmentally sound management (ESM) of e-waste, which arises when such imports reach their end-of-life. The United Nations estimates that domestic consumption makes up the majority (up to 85 percent) of e-waste produced in the region. The problem is further exacerbated by an ongoing stream of used equipment from industrialized countries, significant volumes of which prove unsuitable for re-use, and contribute further to the amount of e-waste generated locally.

To address these challenges, the Basel Convention, which regulates the trans-boundary movements of e-waste, initiated a four-year programme in West Africa to tackle the e-waste generated by electrical and electronic equipment (EEE). Through its efforts to build capacity and raise awareness at the national and regional level, this programme has also promoted South-South Cooperation, resulting in a Pan-African Call for Action.¹⁵

The Secretariat of the Basel Convention coordinated efforts with stakeholders in the region to enhance environmental governance and create favorable social and economic conditions for partnerships and small businesses in the recycling sector. More specifically, it focused on improving the level of information for decision-makers on flows of e-products and e-waste imported into West African countries; increasing the capacity of partner countries to manage the end-of-life

15. Basel Convention, Pan-African Forum on E-waste, *Call for Action on E-waste in Africa*, March 2012. Website: <http://www.basel.int/Implementation/TechnicalAssistance/EWaste/EwasteAfricaProject/Workshops/PanAfricanForumonEwasteNairobiMarch2012/tabid/2656/Default.aspx>.

e-equipment and e-waste at the national level; investigating the feasibility of establishing environmentally sound materials recovery operations; and enhancing the capacity to monitor and control trans-boundary movements of e-waste and illegal traffic.

Numerous training workshops and outreach activities were organized between November 2009 and June 2012. At a regional kick-off meeting in Ghana, a needs assessment was undertaken on the capacity, cooperation, legal powers, and enforcement practices in Benin, Egypt, Ghana, Nigeria, and Tunisia. This resulted in a capacity-building programme to support the enforcement of relevant information and regional legislation related to the import of e-waste in African countries.

In 2010, a “train the trainers” programme on inspection and enforcement was held in Europe, in which 19 African officials, including many government officials, participated. Then, in 2011, national training workshops on inspection and enforcement were held with environment authorities, customs, police, and port authorities in select countries. Activities also highlighted the adverse impacts of illegal imports of e-waste on human health and the environment.

As a result, the participating countries decided to create a regional network to continue sharing information on enforcement. The first Pan-African Forum on E-waste was hosted by UNEP, in March 2012, with support from the Government of Kenya and private sector companies that included Dell, HP, Nokia, and Philips. The main objective of the Forum was to identify possible options for a sustainable solution to e-waste by developing a clear perspective on a framework approach for the environmentally sound management of e-waste applicable in the African context, as well as to acquire an understanding of needs for regulatory frameworks. The Forum sought to provide a platform to discuss ways to establish or strengthen national, regional, and international collaboration. It brought together 180 participants from over 35 countries, including representatives from 20 African countries, four countries outside of Africa, 13 intergovernmental organizations and UN agencies, 14 academic institutions, 22 civil society organizations, and 22 private companies.

The Forum adopted a *Call for Action on E-waste in Africa*, which outlines a common vision and set of priorities to support the development of a

regional approach for the legal trans-boundary movements and the environmentally sound management of e-waste for the African continent. This includes protecting human health and the environment, promoting opportunities for social and economic development, and establishing provisions to continue capacity building and training. At the Forum, UNEP Executive Director Achim Steiner stated:

“The effective management of the growing amount of e-waste generated in Africa and other parts of the world is an important part of the transition towards a low-carbon, resource-efficient green economy. We can grow Africa’s economies, generate decent employment and safeguard the environment by supporting sustainable e-waste management and recovering the valuable metals and other resources locked inside products that end up as e-waste.”

The four-year effort led by the Secretariat of the Basel Convention also involved its Regional Centres in Nigeria, Egypt, and Senegal, the Swiss Federal Laboratories for Materials Science and Technology (EMPA), the Institute for Applied Ecology (the Öko-Institut), the EU Network for Implementation and Enforcement of Environmental Law (IMPEL), and the Partnership for Action on Computing Equipment (PACE). Financial support was provided by the European Commission, Norway, and the United Kingdom, and the Dutch Recyclers Association (NVMP).

3. Case B: Building Capacities for National Satellite Forest Monitoring¹⁶

3.1 Background

The UN-REDD Programme is the United Nations’ collaborative initiative on Reducing Emissions from Deforestation and forest Degradation (REDD)¹⁷ in developing countries. Launched in 2008, the programme builds on the convening role and technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP), and the United Nations Environment Programme (UNEP).

16. Inge Jonckheree of FAO and Alessandra Gomes of INPE contributed to this article.

²UN-REDD website: <http://www.un-redd.org/>.

³More information about this case study can be found on: <http://www.unep.org/south-south-cooperation/case/casedetails.aspx?csno=68>; and http://www.un-redd.org/REDD_and_Green_Economy/tabid/55607/Default.aspx.

17. UN-REDD website: <http://www.un-redd.org/>.

The UN-REDD Programme supports nationally led REDD+ processes, and promotes the informed and meaningful involvement of all stakeholders, including Indigenous Peoples and other forest-dependent communities, in national and international REDD+ implementation. It is estimated that greenhouse gas (GHG) emissions from deforestation and forest degradation contribute up to 20 per cent of the world's carbon emissions. REDD+ includes the sustainable management of forests, and thus holds the promise of multiple benefits for climate, development, and conservation in the forest sector at national and global levels.

As countries advance their REDD+ readiness and develop national strategies to address drivers of deforestation and forest degradation, the cross linkages with the other sectors and themes within national development planning is clear. Thus, it is critical that REDD+ demonstrates links to sustainable development and poverty alleviation, for instance. Facilitating South-South Cooperation is also important, as evidenced by the UN-REDD's programme on National Forest Monitoring Systems Based on Remote Sensing and Geographic Information Systems.¹⁸

3.2 Scaling up national forest monitoring systems and capacity

Since 2009, UN-REDD, FAO, and Brazil's National Institute for Space Research (INPE) have been working side-by-side to support the set-up of national satellite forest monitoring systems in interested UN-REDD countries. The concept took root in the framework of a Memorandum of Understanding signed between FAO and INPE, and has since included capacity building and joint training activities with numerous countries.

The implementation of REDD+ requires advanced methods for monitoring forest carbon stock changes. Current measuring, reporting, and verification (MRV) systems in many countries are not sufficiently accurate, or are simply non-existent. To this end, UN-REDD is collaborating with INPE to provide training and implementation assistance on forest monitoring technology, which was previously developed and deployed within Brazil. INPE's Amazon training center (CRA) in Belém, Brazil, is responsible for hosting the centralized joint trainings on the Brazilian satellite forest monitoring systems.

18. More information about this case study can be found on: <http://www.unep.org/south-south-cooperation/case/casedetails.aspx?csno=68>; and http://www.un-redd.org/REDD_and_Green_Economy/tabid/55607/Default.aspx.

The Brazilian satellite monitoring system is the only and most robust forest monitoring system in the world and has been providing official annual rates of gross deforestation to the Brazilian government since the late 1980s. In addition, since 2004, the system has provided monthly data on forest cover changes in Amazonia to the government control and enforcement agency, allowing appropriate regulating bodies to take early measures to prevent further non-authorized deforestation activities.

Training sessions with FAO began in October 2010, and subsequent technical meetings and training sessions followed in 2011, involving representatives from 30 to 40 countries. While INPE conducted the training on the Brazilian technologies, FAO has assisted with the in-country implementation.

South-South cooperation has been demonstrated at each stage of the project, and continues to be an important component in future plans to expand the initiative to partner countries.

For example, in October 2010, a pilot training course with representatives from Ecuador, Guyana, and Mexico was held at INPE's headquarters in São José dos Campos, Brazil, and focused on the applicability of the Brazilian satellite forest monitoring system, TerraAmazon, in partner countries. The goal of the collaboration in this capacity building effort was for the Brazilian trainers to teach the forestry and IT experts to use the TerraAmazon system, adapt it to their individual country needs, and ultimately enhance their existing national forest monitoring systems.

Another training course held in September 2011 involved representatives from the Democratic Republic of Congo, Papua New Guinea, and Vietnam, and consisted of computer science experts and GIS forestry specialists from national government institutions, who were responsible for the implementation of REDD+ and/or national forest monitoring. The course aimed to improve baseline knowledge of remote sensing, information technology and modelling techniques for a satellite-based forest monitoring system.

The curriculum included assessment of historical forest cover changes within their respective home countries. This dual discussion of Brazilian technologies alongside analysis of country-specific contexts

was particularly valuable for enhancing capacity to apply the technologies to a variety of regions and settings. In November 2011, a follow-up meeting with these countries was held in Rome.

Satellite forest monitoring systems are also valuable as part of the reporting of greenhouse gas emissions, and required under the Intergovernmental Panel on Climate Change (IPCC) Guidelines and Guidance. In this context, FAO, INPE, and UN-REDD have worked with the Democratic Republic of Congo and Papua New Guinea to launch their national forest monitoring systems in 2011. These portals allow all end-users to follow and access available forest data, which is frequently updated to reflect the national forest conditions within each country.

In 2012, FAO assisted with launching national satellite monitoring systems in Paraguay, Ecuador, and Zambia as well. Since 2013, FAO is also assisting Argentina, Cambodia, and Zambia. The ultimate goal of all these joint efforts is to build up the autonomous capacity of REDD+ countries to monitor their forest-related land cover, generating annual national data on deforestation, forest degradation, and forest conversions.

The joint collaboration with INPE has shown that capacity building in most of the REDD+ countries is essential. The transfer of technical skills, as well as the introduction of the national forest monitoring systems for REDD+, are a major challenge for these countries. However, this programme has helped to ensure that countries become autonomous in monitoring their forests for REDD+.

4. Case C: The Sino-Singapore Tianjin Eco-City: A Model for Sustainable Development¹⁹

4.1 Background

Urbanization has placed enormous pressure on our planet's resources and environment. With more than half the world's population living in urban areas and expected to grow, the need for sustainable urbanization has emerged as an economic and political imperative in both developed and developing countries.

¹⁹ More information about this case study can be found on: <http://www.unep.org/south-south-cooperation/case/casedetails.aspx?csno=114>.

It was against the backdrop of increasing international concern that the leaders of Singapore and China agreed to jointly develop an Eco-City, as a model for sustainable urbanization. This idea was first proposed by Singapore to China in 2007, and seven months later the countries' leaders signed a Framework Agreement to develop the Sino-Singapore Tianjin Eco-City.

Led by the two governments, the project has brought together the expertise and experience of Singapore and China in urban planning and sustainable development. At the same time, the development of the Eco-City is operated on a commercial basis by the private sector. This helps to ensure that this is a commercially viable project that can be easily replicated by other developing countries in other regions.

The short-term target is to complete a three-square km "start-up area" by 2013. The area selected was specifically chosen, as it was non-arable, short of freshwater, and included a 270-hectare wastewater pond. Developers wanted to ensure that it would not impede on existing farmland or biodiversity. When completed in the early to mid-2020s, it is envisioned that it will be a socially harmonious, environmentally friendly, and resource-efficient city for a population of about 350,000 people. Moreover, it is intended to serve as a practical model for sustainable development for other cities in China.

4.2 Working in partnership to share best practices and costs: The Sino-Singapore Tianjin Eco-City

China's rapid industrialization in recent decades has resulted in an equally rapid urbanization, as rural laborers seek new opportunities in the country's numerous cities. Yet, in tandem with China's new economic developments and rising living standards, environmental pressures, such as resource depletion, waste management, and, most noticeably, air pollution, have emerged. Given the



An image of the Tianjin Eco-City

increasing GHG emissions and the effects of climate change, the concept of eco-cities as a model of sustainable development has gained traction, and the Tianjin Eco-City project is one prominent example. Singapore's reputation as a clean, green Asian city, together with its track record of

close collaboration with China, made it a suitable partner for this undertaking.

As a government-to-government flagship project, Singaporean and Chinese officials regularly come together to share best practices in areas such as urban planning, environmental protection, water and waste management, and public housing. The following are a few examples of the cooperation that has developed between these two countries as a result of the Eco-City project, which can then be used as an example for further South-South cooperation around the region.

The Eco-City's master plan was jointly formulated by planning experts from the China Academy of Urban Planning and Design, the Tianjin Urban Planning and Design Institute, and the Singapore planning team led by the Urban Redevelopment Authority. The plan balances environmental, economic, and social needs when allocating land for various uses, and revolves around the principles of good land use and transportation planning. There has been no internationally agreed upon definition for what constitutes an eco-city.

To define the goals and measure the progress of the Eco-City, the Singapore and Chinese governments established a set of 22 quantitative and four qualitative Key Performance Indicators (KPIs), which cover various aspects of sustainable development. For example, they decided that 20 percent of energy utilization should come from renewable sources, such as wind, solar, and geothermal energy. KPIs related to the social aspects of building sustainable communities were also included. For instance, 20 per cent of the residential units will be developed as affordable public housing to cater to the lower income groups. This ensures that the Eco-City can provide affordable homes for all segments of society.

Another KPI in the Eco-City calls for 100 per cent of all buildings to be green. China and Singapore jointly developed a Green Building Evaluation Standard (GBES) to evaluate the buildings in the Eco-City. This combines the best features of Singapore's Green Mark and China's Green Star system. GBES buildings are designed with six principles in mind: to save energy, save materials and water, facilitate efficient operations and management, and provide a high quality and an eco-friendly environment, both indoors and outdoors.

In addition, Singapore's National Environment Agency (NEA) has worked closely with the Eco-City Administrative Committee (ECAC) to develop an integrated environmental and water quality monitoring system for the Eco-City. Both entities want to ensure that the Eco-City's various environmentally related KPIs, such as treatment of hazardous waste, noise pollution levels, ambient air quality, carbon emissions levels, and overall recycling rates, are met. Furthermore, a range of financial tools and incentives have been put in place to attract international companies to the Eco-City. For example, the Eco-City is the first and only city in China that enjoys voluntary foreign exchange settlement. This allows international companies to avoid financial losses from fluctuating exchange rates. International Enterprise Singapore, the government agency spearheading the overseas growth of Singapore-based companies and promoting international trade, has also committed USD 9.5 million from 2012 to 2016 to assist eligible Singapore and Singapore-based companies interested in investing in the Eco-City.

The Tianjin Eco-City is still a work in progress and it is too early to draw any conclusive lessons learned. However, it is increasingly recognized that sustainable cities are viable and attractive propositions, which do not need to be financially prohibitive for developing countries. There are many cost-effective solutions for developing Eco-Cities, if sustainability can be integrated into the city's development plans right from the start.

Beginning with a well thought out master plan can encourage residents to make choices that are environmentally friendly but not unnecessarily burdensome in the future. This could include building pleasant pedestrian walkways and making public transport convenient and efficient to reduce reliance on private vehicles, as well as help lower greenhouse gas emissions.

In constructing buildings, many passive design strategies can be adopted to make the buildings greener without adding much to costs. For example, the building form in the Eco-City will be kept compact to maximize spatial and energy efficiency. Through simulations, homes are oriented toward certain directions to ensure that they receive at least two hours of sunlight every day, even during the cold winter months. This not only saves electricity, since the use of heating/ lighting can be reduced, but it also ensures that users' comfort levels can be better met.

Also, the Tianjin Eco-City has demonstrated that public-private partnerships can be harnessed to develop practical and affordable urban environments, creating a winning situation for all. In order for such projects to be successful, however, it is important that they are backed by strong political leadership and a resolve to channel public resources so that they create the right conditions to enable private, green investment. The Tianjin Eco-City project has opted for cost-effective and practical improvements that can be scaled up and replicated by others.

5. Case D: Feed-in Tariffs Promote Biomass-based Cogeneration in East Africa²⁰

With support from the Cogen for Africa Project, the James Finley Ltd. Tea Estate is successfully running a biomass-based cogeneration plant to power its processing equipment, while using the heat from the facility to dry its tea. Excess electricity generated by the cogeneration plant is then used to provide electricity to its employees for their housing, medical, and educational facilities. In addition, sustainably managing the estate's wood plantation to feed the cogeneration plant requires a substantial workforce, creating jobs for the local community.

This case illustrates how new technologies are creating opportunities to build low-carbon, green economies, which contribute to sustainable development and poverty eradication.

Cogeneration, sometimes known as combined heat and power (CHP), is the use of a power plant to simultaneously generate electricity and thermal heat. In contrast to conventional power generation, which normally has fuel efficiency on the order of 35 per cent with the rest of the fuel lost as wasted heat energy, cogeneration captures this waste energy as useful heat. This increases the fuel use efficiency to over 80 per cent, thus enhancing the overall energy system efficiency and making it possible to export any excess-generated power to the national grid.

Power purchase agreements, or feed-in tariffs, create conditions for enterprises to sell independently generated electricity back to the grid, and in many cases receive a premium from the utility. Efforts to maximize electricity production output to the grid encourage enterprises

20. More information about this case study can be found on: <http://www.unep.org/south-south-cooperation/case/casedetails.aspx?csno=56>.

to invest in larger cogeneration facilities, and also to increase efficiency.

The James Finley tea company illustrates how the Cogen initiative is helping private-sector agro-processing industries across East Africa realize the potential economic and environmental benefits of efficient cogeneration systems. In this case, the Cogen initiative provided technical support and financing for the installation of the cogeneration facility at the tea company, and is helping to assess the feasibility of a larger cogeneration plant so the facility can become grid-independent.

The Cogen for Africa initiative has drawn on the unique technical and policy expertise of Mauritius, where over half the nation's electricity comes from cogeneration facilities – a significant achievement for an island that consumes ten times more electricity per capita than Kenya.

One of the key drivers of the Mauritius cogeneration success was the introduction of a feed-in-tariff for excess electricity generated by the sugar companies and sold to the national grid. The successful deployment of cogeneration in Mauritius has provided confidence to prospective investors and policy makers considering similar efforts.

Building on an innovative South-South exchange platform, the Cogen for Africa project has been instrumental in promoting feed-in-tariffs for biomass-based cogeneration throughout the region. This positive experience has contributed to the development of feed-in-tariffs in Malawi, Tanzania, and Uganda, and Ethiopia is also considering implementing a similar model.

Since the project began, the Cogen initiative has assisted with the installation of the first-ever advanced model cogeneration facilities in Kenya's tea sector and in Uganda's sugar industry. In the case of Uganda, the cogeneration plant not only meets all the energy needs of the country's largest sugar factory, the Kakira Sugar Company, but also sells excess clean electricity to the national grid, which displaces higher priced and polluting fossil fuel-based electricity.

Thus, this experience demonstrates intrasectoral cooperation and knowledge sharing. As a result, there is growing interest in other sectors, such as the flower industry in Kenya, to also explore its use.

The Cogen for Africa initiative is supported by a group of international organizations, including the African Development Bank, Global Environment Facility and UNEP, as well as the Kenyan non-government organization, Energy, Environment and Development Network for Africa (AFREPREN/FWD),



Transmission lines in Kenya

and it has produced some important lessons for future public-private endeavours. For example, business transactions between countries in the South can result in significant technology transfer between firms, thus reducing costs and increasing competitiveness. Also, as we have seen, one innovating company within a sector may stimulate adoption of similar practices among other sectors and its competitors.

While countries can learn from the policy and technical successes of other countries, these connections are not always made by the markets or enterprises themselves. In this instance, the NGO, AFREPREN/FWD, has played a key role as a facilitator in sharing Mauritius's experience with stakeholders in Kenya and throughout the region.

In addition, the co-financing of feasibility studies has been instrumental in ensuring the support of these projects. By nature of their scale and clout, international organizations can help mobilize the resources required to start-up and scale-up these efforts. Furthermore, it has been shown that companies are more willing to invest in feasibility studies if they share some of the financial risk with an international institution or national partners.

Finally, closer interaction among African countries, particularly in the context of sub-regional groupings, such as the East African community and the Southern African Development Community (SADC), can provide a supportive environment for replicating innovative and well-documented policy measures in other countries, as demonstrated by the Cogen initiative.

6. Final Remark

All of these initiatives demonstrate the positive impact that South-South Cooperation and Triangular Cooperation is having on greening national

economies, as well as highlight the opportunities for these countries to achieve their sustainable development aspirations.