

Khor, Martin

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RISKS AND USES OF THE GREEN ECONOMY CONCEPT IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT, POVERTY AND EQUITY

Martin Khor



RESEARCH PAPERS

40

RISKS AND USES OF THE GREEN ECONOMY CONCEPT IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT, POVERTY AND EQUITY^{*}

Martin Khor

SOUTH CENTRE

JULY 2011

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THE SOUTH CENTRE

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South Centre
Ch. du Champ-d'Anier 17
POB 228, 1211 Geneva 19
Switzerland
Tel. (41) 022 791 80 50
Fax (41) 022 798 85 31
south@southcentre.org
www.southcentre.org

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I. THE CONTEXT OF SUSTAINABLE DEVELOPMENT AND GREEN ECONOMY

The “green economy” has become a topic of growing discussion in light of the environmental crisis. It has also become a rather controversial term, perhaps because it has become the subject of a multilateral negotiating process, within the Rio-Plus-20 framework. The “green economy” is not a concept that has yet to enjoy widespread agreement (among economists or environmentalists) or an international consensus. It is an extremely complex concept and it is unlikely there can be a consensus on its meaning, use and usefulness and policy implications, in the short term. A “green economy” gives the impression of an economy that is environmentally-friendly, sensitive to the need to conserve natural resources, minimises pollution and emissions that damage the environment in the production process, and produces products and services the existence and consumption of which do not harm the environment.

Among the **difficult questions** are whether the attainment of such an economy constrains other aspects (including economic growth of poor countries, social development such as poverty eradication and job creation); how to identify and deal with the trade-offs; what are the appropriate combinations between these aspects and at different stages of development as well as stages in the state of the environment; what is the role of the state in regulation and investments and defining frameworks; how compatible is a green economy with the free market and what is the appropriate way to address the role of the private sector; how to build an economy that is more environmentally-friendly, and how to handle the transition from the present to the greener economy?

The Green Economy issue being discussed in the Rio Plus 20 process must also be **context specific**, or specific to the framework in which it is being discussed. This context is the Rio Plus 20 conference, which is a follow up to Rio 1992. This is explicit in the mandate of the 2012 Conference that refers to “a green economy in the context of sustainable development and poverty eradication”. For this purpose, the green economy is thus not an academic idea for free brainstorming. It must be derived from and rooted in the spirit, objectives, principles and operationalising of the United Nations Conference on Environment and Development (UNCED) 1992, and especially the Rio Principles and Agenda 21. This should be supplemented by the Rio Plus 10 conference outcomes and commitments.

The main framework of UNCED 1992, its related agreements (the United Nations Framework Convention on Climate Change (UNFCCC), United Nations Convention on Biological Diversity (CBD) and the United Nations Convention to Combat Desertification) and its follow-up processes is to place the environment together with development in a single context. This is a unique achievement which has to be preserved and advanced, and not detracted from or diverted from.

UNCED was a watershed event that raised hopes of people around the world of the emergence of a new global partnership. This new partnership, arising from the “Spirit of Rio”, would change the present course of international relations, tackle the growing global environment crisis and simultaneously strive for more equitable international economic relations that would be the basis for promoting sustainable development (including addressing the environment crisis) globally and in each country.

The unique and important achievement of UNCED was that through its long, open and participatory preparatory and Summit processes, the world's diplomats, policy makers and highest political leaders recognised not only the environment crisis in its many facets, but how this was embedded in economic and social systems, and that a realistic and long-term solution lay in dealing with both the environment and the development crises simultaneously and in an integrated fashion.

UNCED also involved thousands of non-governmental organisations, making it an important landmark for catalysing the development of a "global citizen movement" and also enabled a dialogue between civil society and governments. It generated an international community that shared an understanding of the integrated nature of environment and development, and a recognition that in the next few years there was the crucial need and opportunity to save humanity from environmental catastrophe and social disorder.

The "compact" or core political agreement at the Earth Summit was the recognition that the global ecological crisis had to be solved in an equitable way, through partnership. This was captured in the principle of "common but differentiated responsibility" in the Rio Declaration. This principle acknowledged that developed countries have historically and at present been more responsible for the despoliation of the global environment, have more resources due to the imbalances in the world economy, and have greater responsibility in resolving environmental problems. Developing countries were hampered from meeting the basic needs of its people by their unfavourable position in the world economy, and their national resources were being drained through falling commodity prices, heavy debt burdens and other outflows. Development is their top priority and environmental concerns should be integrated with (and not detract from) development objectives.

The UNCED framework recognised and built in some of the key complexities of an integrated approach:

- It recognised the environmental crisis and the need for deep reform of production and consumption patterns. It recognised the sustainability principle, that present production should not compromise meeting the needs of the future. It recognised the precautionary principle.
- It also also recognised the "right to development" and the development needs and priorities of economic growth in developing countries plus social development goals including poverty eradication, jobs creation, food, health, education, etc.
- From the recognition of the above, the three pillars of "sustainable development" were accepted as environmental protection, economic development and social development.
- It recognised the need not only for national action but also international policies and actions in understanding and addressing the issues, and that for developing countries national action must be supported by international policies and actions to enable implementation of sustainable development.

- In this context it recognised that countries played different roles in contributing to the environmental crisis, that countries are at different stages of development, and that these must lead to key principles and have important implications for actions and for the international cooperation framework.
- Out of this arose the equity principle of common but differentiated responsibilities. It recognised that the major contribution to pollution (including Greenhouse Gas emissions) and resource depletion was by developed countries, and that developing countries are now disadvantaged because there is little “environmental space” left, which has implications for their future development. In practical terms, there should be a three-prong approach to achieving sustainable development: (1) The developed countries have to take the lead in changing production and consumption patterns (their economic model); (2) Developing countries would maintain their development goals but take on sustainable development methods and paths; (3) Developed countries commit to enable and support the developing countries' sustainable development through finance, technology transfer and appropriate reforms to the global economic and financial structures or practices (this is why there were chapters on finance, technology, trade, commodities, etc in Agenda 21).

In concrete terms, the implications of the above were as follows:

First, the North would change its production and consumption patterns. It would take the lead in improving environmental standards, reduce pollution and the use of toxic materials, and cut down the use and waste in natural resources, including through changing lifestyles. By "putting its own house in order", the North would show an example to the rest of the world that there is a need for a change in economic and social behaviour in order to solve the environment crisis;

Second, the North would help the South with financial aid and technology transfer, and through partnership in bringing about a more favourable international economic environment (through more equitable terms of trade, debt relief, etc). This would enable the South to have greater resources and a larger "development space" that would in turn facilitate a change in the development model that would be more environmentally sustainable;

Third, the South, having more financial and technological resources, would manage its economy better, give priority to policies that meet people's needs, improve pollution standards and reduce depletion of resources such as forests.

Fourth, international agencies and structures would help further this process; for example, by reducing the debt problem of developing countries and reviewing the content of structural adjustment policies, by ensuring that the trade system brings about more favourable results for developing poor countries, by helping to mobilise financial resources and providing technical aid in improving environmental standards.

Fifth, issues requiring an integration of economic and environmental concerns (such as the interaction of trade and environment; and the relation between intellectual

property rights and environmental technology and indigenous knowledge) should be resolved through North-South partnership in which the development needs of the South would be adequately recognised.

If the above principles are to be followed, then the concept of sustainable development would have at least two major components, each balancing the other: environmental protection and meeting the basic and human needs of present and future generations. Thus, sustainable development would not only involve ecological practices that enable meeting the needs of future generations, but a change in production and consumption patterns in an equitable manner whereby resources which are currently being wasted are saved and rechanneled to meeting the needs of everyone today as well as the needs of future generations. In this concept, equity among and within countries in the control and use of resources in ecologically prudent ways is a most critical factor.

The centre of the North-South debate and negotiations was conducted in the negotiations on the Rio Declaration on Environment and Development and on the Agenda 21 Chapters on financial resources and on technology transfer. The Rio Declaration negotiations became the heart of the UNCED's debate and later "partnership" on the political principles that would govern international relations in the treatment of global environmental problems. The developing countries insisted that the rich and poor countries should not be viewed on similar terms in relation to the causes and burden of resolving environmental problems, but that the North should bear a larger burden of costs and responsibilities due to their larger share in causing the problems and their relatively larger capacity to meet the costs. Eventually, much of the South's arguments and perspectives prevailed, as manifested in several of the Rio Declaration principles, especially Principle 3 that "the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations", and Principle 7 that "in view of the different contributions to global environmental degradation, States have common but differentiated responsibilities" and that "developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command."

Meanwhile, intense attention was also focused on finance and on technology transfer, as these two issues had for the developing countries become the "proxies" or test issues to determine the seriousness of the North in extending assistance to or agreeing to partnership with the South. The central argument of the Group of 77 (G77) and China was that developing countries could successfully make the transition to sustainable development only if they could simultaneously take care of their development needs. In line with the principle of differentiated responsibility and partnership, the North had to contribute to "new and additional" financial resources to the South as well as facilitate the effective transfer of technology at concessional terms to the South. Since the larger issue of redressing the inequitable and unbalanced international economic and trade systems had been side-stepped midway in the negotiating process, financial aid and technology transfer had become the specific issues on which North-South "partnership" would be negotiated and tested.

The conference in 2012 to mark the 20th anniversary of the Rio Summit is meant to review the implementation of the Rio outcomes. The review would be on

the extent to which the sustainable development objectives have been met, identify the implementation gaps and propose measures for the way forward. As the “green economy” concept is being discussed as part of this process, it must thus be placed integrally within this holistic framework of UNCED, the Rio Principles and Agenda 21. This framework also was the fundamental basis of the UNCED and CBD. The green economy should have as its basis the environmental imperative, the development (economic and social) imperative and the equity principle that links the environment and development dimensions. The green economy should thus be defined and operationalised in this EDE (environment, development, equity) framework, which must also incorporate both the national and international dimensions. Objectives, principles, policies, proposals, initiatives, on the green economy should be within this EDE framework.

It would be useful in the discussions on Green Economy in the Rio Plus 20 process to point out the risks of the concept being misused, or being associated with adverse connotations that detract from the sustainable framework, while discussing ideas or policies for promoting the green economy in the sustainable development context.

II. RISKS OF MISUSE OF THE GREEN ECONOMY CONCEPT

Concerns have been raised by developing countries' delegations that the “green economy” concept may be misused or taken out of context, and that the promotion of the “green economy” concept may give rise to unhelpful or negative developments, and these must be avoided.¹

One dimensional approach

The first risk is that the “green economy” is defined or operationalised in a one-dimensional manner, taken out of its being embedded in the sustainable development framework, and promoted in a purely “environmental” manner (without considering fully the development and equity dimensions) and without consideration of the international dimension, especially its negative effects on developing countries. In such a situation, if the green economy concept gains prominence, while the sustainable development concept recedes, there may be a loss of the use of the holistic sustainable development approach, with imbalances between the three pillars.

“One size fits all” approach

The second risk is that a “one size fits all” approach is taken, in which all countries are treated in the same manner. This would lead to failures either for environment, development or both. The levels and stages of development of countries must be fully considered, and the priorities and conditions of developing countries taken into account. The principle of common but differentiated responsibility should be respected and operationalised. Thus, in considering various principles, policies and targets, adequate flexibilities and special treatment should be provided for developing countries, such as exemptions, allowance for more lenient obligations, and the provision of finance, technology and capacity building.

Risk of using environment for trade protection

Thirdly there is a risk that the environment, and by implication the “green economy”, can be inappropriately made use of by countries for trade protectionist purposes, and that in particular developed countries may use this as a principle or concept to justify unilateral trade measures against the products of developing countries. One example are the proposals or plans to impose a “carbon tariff” or “border adjustment tax” on products on the grounds that these generated emissions of carbon dioxide during the production process above a certain level, or that the exporting country does not have emission controls of a standard deemed adequate by the importing country. Developing countries are strongly opposed to such trade measures, which are seen as protectionist. This would penalise developing countries

¹ These concerns were raised for example at the first preparatory meeting of the Rio Plus 20 process held in May 2010 and at the United Nations Conference on Trade and Development (UNCTAD) meeting on the green economy: trade and sustainable development implications in October 2010.

that do not have financial resources or access to low-emission technologies, and thus violate the principle of common but differentiated responsibilities.

Just prior to the establishment of the World Trade Organization (WTO) and in the few years after its establishment, there was a major debate inside and outside the WTO on the possible role of trade-related environment measures and in particular about the possible use of the concept of “processes and production methods (PPMs).” The PPM concept had been introduced by some Parties and by some non-governmental organisations (NGOs) as a means of distinguishing between products by the manner in which the products are made and the environmental effects (for example, the volume of pollution) arising from the production.

The WTO’s non-discrimination principle states that a Member shall not discriminate between “like products” from different trading partners, and between its own and like foreign products, thus giving them national treatment. Thus the amount or rate of any taxes or charges on imports cannot be more than what is charged on “like” local products.

This raises the issue of what is a “like product” and the related issue of PPMs. Many developing countries are of the view that if two products are “like” because their physical characteristics are similar, they should be treated in a similar way, and that differences in the production processes or methods and the manner in which the production takes place (including the environmental aspects) would not make these products “unlike.” Thus, it would be against the General Agreement on Tariffs and Trade (GATT) rules to take a trade measure (such as an extra import duty) on a foreign-made product on the grounds that the production method is less environmentally sound.

In 1994, some international environment NGOs proposed to amend GATT rules to enable WTO Members to use trade-related environmental measures (TREMs) to enable import restrictions based on PPMs, citing as an example the European Union’s difficulties in imposing a carbon tax because of concerns over competitiveness of European industry being affected. It advocated TREMs to promote internalizing the environmental costs of traded goods and setting a “fair price” for a traded product (Raghavan, 1994).

In contrast, the Third World Network (TWN) argued that the proposals to legitimize TREMs would add another burden of adjustment to the already-burdened South, and could “change the basic principles of non-discrimination and the character of the multilateral trading system and change the basic rules of the game and the conditions of competition under the guise of protecting the environment...In practice it will add additional burdens on the South” (TWN, 1994). The three related concepts of PPMs, eco-dumping and internalization of costs, in the WTO context, would imply that if a country has lower environmental standards in an industry, the cost of the product is not internalized and the prices are too low and that country is practicing eco-dumping. Thus the importing country has the right to impose trade penalties such as countervailing duties. The paper described several examples of how these concepts would be difficult or impossible to be implemented and how they would unfairly be biased against the developing countries. “There is the danger, if not the likelihood, that through particular and narrow definitions of the trade-

environment link, the powerful nations will try to shift the economic burden of ecological adjustment to the weaker parties in order to preserve and expand their own unsustainable consumption patterns,” argued the TWN. It suggested that the initiatives to introduce TREMs and legitimize PPMs in the WTO be abandoned. It proposed instead that any trade measures linked to the environment should be addressed by negotiations for an international treaty and any treaty containing obligations on developing countries must have provisions for technology transfer and financial resources as an integrated contractual obligation (TWN, 1994).

The PPM debate was taken up within the WTO in the Committee on Trade and Environment in 1996. Because of the stand of the developing countries, the attempts to legitimize PPMs in the WTO rules did not succeed, and the PPM issue lay dormant for some years. However, with the increasing interest in introducing trade measures linked to climate change issues, the PPM issue has sprung back to prominent life in recent years. Another method to justify the use of unilateral trade measures is to make use of GATT Article XX, the general exception to the normal GATT rules. Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade, countries can take measures contrary to the GATT rules on certain grounds, including measures “necessary to protect human, animal or plant life or health” and measures relating to the conservation of exhaustible natural resources.

The Article XX exception provisions for the environment have become an important part of the currently intense discussions on whether trade measures (and in particular border adjustment measures) linked to climate and other environmental objectives are compatible with WTO rules.

In Europe, some political leaders have made bold statements, proposing the use of sanctions on imports, on climate grounds. In October 2007, the French President Nicolas Sarkozy said in a speech in France that the European Union (EU) must examine the possibility of “taxing products imported from countries that do not comply with the Kyoto protocol. We have imposed environmental standards on our producers. It is not normal that their competitors should be completely exempted...Environmental dumping is not fair. It is a European issue that we must raise” (Sarkozy, 2007).

In the United States, several climate-related bills were introduced in the Congress in the recent years, and a common feature is the inclusion of a border adjustment mechanism, in which importers will have to purchase “international reserve allowances” to cover the cost of emissions in the imported products. In June 2009, the House of Representatives passed the American Clean Energy and Security Act (also known as the Waxman-Markey bill²). The bill introduces a cap-and-trade system for the United States, in which producers will have to purchase emission allowances for exceeding certain emission limits. The bill also obliges the US President to place a charge on importers of certain products that come from many developing countries by 2020. The importers will have to buy “allowances” for the

² See Yu (2009a and 2009b) and Khor (2009a and 2009b) in South Bulletin 10 Sept. 2009, for details and analyses of the Waxman-Markey bill.

emissions of the products they bring into the country. In effect, this is like putting an extra tax or duty on the developing countries' goods, and the rate may depend on how much carbon dioxide is emitted during the making of these products. The bill's advocates say this is needed so that US domestic firms, which will also have to pay for emissions allowances, can maintain their competitiveness vis-à-vis imports. Importers of goods from countries that have not undertaken emission reduction commitments as stringent as the US in an international agreement (or that do not meet two other criteria) will have to purchase "international reserve allowances". Least developed countries are exempted, as are also those developing countries accounting for a small share of the total emissions. This means that middle-income developing countries and those with large populations will be affected. Importers of their heavily-traded energy-intensive products will have to buy emissions allowances, a measure that will raise the prices of the imports, which could affect their sales in the US. The products to be subjected to this new import charge are expected to include chemicals, iron and steel, cement, glass, lime, some pulp and paper products, and non-ferrous metals such as aluminium and copper.

India and China attacked this part of the Waxman-Markey Bill as constituting disguised protectionism and flouting the rules of the WTO. The Indian Environment Minister Mr. Jairam Ramesh described carbon tariffs as "pernicious." A spokesperson of China's Ministry of Commerce criticised developed countries for proposing to impose carbon tariffs, stating "this violates basic WTO rules. It only pretends to protect the environment, but really it protects trade...It doesn't strengthen faith in the international community's cooperation against the crisis."

Following the passage of the Waxman-Markey bill, in October 2009, a separate bill was also introduced in the US Senate, which also contains a provision on border adjustment measures. Although it appears unlikely that a joint House-Senate climate bill will be passed in the near future, it is also most likely that any future bill would contain a border tax adjustment clause.

The use of trade measures with the effect of blocking developing countries' goods on climate grounds has the potential to deal a severe blow to the multilateral trading system, as well as adversely affect the climate negotiations under the UNFCCC. Many developing countries would consider this as an attempt by developed countries to evade their commitment to assist developing countries, and instead shift the burden of adjustment onto these developing countries. India's Former Ambassador to the WTO, Ujal Singh Bhatia, commenting on unilateral measures being considered by developed countries, such as "offsetting" tariffs on imports based on carbon content, stated: "The debate on PPM will be revived. The agreements in GATT/WTO or the jurisprudence arising from them do not provide an adequate basis for such measures. In the absence of clear disciplines in this regard, autonomous measures can only invite acrimony and discord. They can also provide a good cover to protectionism. The dispute settlement in the WTO does not have a robust basis to adjudicate on such measures. As a result of such actions, the credibility of the WTO can come under severe stress" (Bhatia, 2008). Senior officials of the former Bush administration were also well aware of the controversial nature of the border adjustment aspect of US climate bills, and indicated their opposition to it. The then US Trade Representative, Susan Schwab, in March 2008 said she had serious concerns over proposals in legislation that may be perceived as unilateral

trade restrictions, and that trade ministers that met in Bali in December 2007 agreed that “trade restrictions run the risk of tit-for-tat retaliation and even an all-out war where no one wins and everyone loses.”³

Attempting to gain market access through the guise of environment

Another risk is that the environment is misused as a disguised method by countries to promote the access of their goods and services into markets of other countries. There is a fear that the Green Economy concept could be used as a front for mercantilist interests. For example, concerns have been expressed by developing countries in the WTO that some developed countries have been attempting to get them to eliminate the tariffs of many of their goods that the proponents claim are “environmental goods.” This follows a mandate in the Doha negotiations to reduce or eliminate barriers to environmental goods and services.

In 2007, the US and the EU jointly proposed to liberalise trade in many “climate friendly” goods and services. They stated this would spread green technologies globally. In the proposal, there would first be liberalisation of 43 goods, to be followed by an Environmental Goods and Services Agreement with further binding commitments to eliminate tariffs and non-tariff barriers in trade in green technologies. Ambitious and comprehensive commitments would also be undertaken in services that address environmental and climate change challenges. Developing countries would be asked to make contributions proportionate to their level of development.

The US-EU proposal was criticized by some developing countries for being an expanded version of earlier proposals that are more about the market-access ambitions of the major countries and less about assisting developing countries to tackle climate change. They pointed out double standards in the choice of climate-friendly products on the list, as the list reflects products of export interest to developed countries, whereas developing countries’ products, such as bio-fuels, which are of major interest to Brazil, were absent. On environmental services, the list in the proposal covered a wide range, including sensitive sectors, since many of them are public utilities.

On “environmental goods”, the US-EU argument that the tariff elimination would benefit developing countries as the products will sell at the cheapest prices runs into the same type of criticism regarding proposals for import liberalisation in food products. Many developing countries in the WTO agriculture negotiations have instead taken the position that their sensitive food products be allowed special lenient treatment for tariff cuts on the ground of food security, farmers’ livelihoods and rural development. In the same line, developing countries can have more policy space if they do not lower their bound tariffs of “environmental goods” to low levels or zero. They then have options to develop their own industries and products while maintaining tariffs that are appropriate to this objective. Eventually developing countries would like to be able to produce their own climate-friendly products instead of importing them. The acceleration of liberalisation of the tariffs would reduce these

³ "USTR Schwab warns of trade war potential of CO₂ laws", *Dow Jones Newswires*, 5 March 2008.

policy options. The market opening by developing countries to developed countries' environmental goods and services through tariff and non-tariff barrier elimination could indeed lead to a situation of technology-dependency – in which developed countries become the sole providers of such goods and services. A more appropriate approach would require the promotion of larger policy measures designed to support developing countries' ability to adopt, adapt, and innovate on such goods and services as well as develop their own environmental goods and services in order to support economic development and diversification efforts. Such an approach would also need to be accompanied by adequate financing and technology transfer. (South Centre, 2007).

At the Trade Ministers' meeting on the sidelines of the UNFCCC climate conference in Bali in December 2007, there were reportedly sharp differences between the Brazilian Foreign Minister and the US Trade Representative on the issue of liberalisation of environmental goods and services. At a post-Conference press conference, the USTR said that the elimination of tariffs on products like hydrogen fuel cells would increase the use of clean technologies. On the other hand, the Brazilian Minister was critical of the US list of environmental products for tariff elimination, complaining that the list was incomplete and would not do much for climate change, and that it was unfortunate that ethanol was excluded from the list which was "very strange" since this product with a proven record was not on the list, if the real objective is climate change.⁴

In October 2009, a group of mostly developed countries (Canada, the European Union, Japan, Korea, New Zealand, Norway, Taiwan Province of China, Singapore, Switzerland, and the United States) put forward a negotiating proposal in the WTO environmental goods negotiations suggesting that tariffs on all environmental goods be eliminated (i.e. have a tariff rate of zero) with developing countries to be given a transition time of a few years within which to do so. They argue that this would result in a "win-win" proposition: one that is good for trade and good for the environment, because trade flows in environmental goods would increase while at the same time the environmental impacts would be decreased.

However, a South Centre article by Yu (2011)⁵ points out that doing so would create a development "loss" for developing countries. Since developed countries already apply quite low or zero tariffs on most industrial goods, including environmental goods, their burden of effective tariff reductions would be relatively much less than for developing countries. In short, developed countries are effectively asking developing countries in the context of the WTO negotiations in environmental goods to:

- Radically reduce their applied and bound tariffs on industrial products under the pollution management category by much more than what developed countries would be required to reduce. Developing countries' applied tariffs on such products average more than 8% (with most low- and middle-income

⁴ Martin Khor, "Trade Ministers propose more intensive trade-climate engagement", *TWN Bali News Updates and Climate Briefings*, 2008.

⁵ Vice Yu, "Environment Talks in WTO : Assisting the South or Making it Dependent on Imports of Technology?", *South Bulletin*, 15 April 2011. The rest of this sub-section is drawn from this article.

developing countries having applied tariffs around 15-30%) and the bound tariffs on average around 32%;

- Treat the environmental goods negotiations as a separate “sectoral negotiation” to reduce or eliminate tariffs reduction or eliminate tariffs, with modalities different from (and steeper than) the tariff cuts under the NAMA negotiations on industrial goods.

This treatment would move the environmental negotiations away from reflecting the principles of less than full reciprocity and special and differential treatment that rightfully favour developing countries.

More seriously, cutting tariffs to zero for environmental goods would result in a surge of imports into developing countries and make them dependent on these imported goods and make it difficult or impossible for local industries producing environmental goods to survive or develop. The developing countries would also become technologically dependent, unless other measures are put in place to ensure that developing countries can obtain and design the technologies themselves.

The argument that the tariff elimination would benefit developing countries as they can import the products more cheaply runs into the same type of criticism regarding proposals for import liberalization in food products (since the countries place a high priority on domestic food production). Thus they are also against being pressurized into having to eliminate their tariffs on environmental goods since they wish to preserve policy space to be able produce these goods and their infant industries would need protection at least initially.

The treatment of subsidies

Another concern of many developing countries is that some developed countries have been providing their companies with major subsidies for the research and development (R&D) of environmentally sound technologies. This puts developing countries at a disadvantage, especially since they lack the financial resources to match the developed countries' subsidies. Given this unfair imbalance in subsidies, the developing countries and their firms would be in an even worse competitive situation if they have to lower their tariffs on environmental products.

Developing countries have also been concerned that government subsidies for research and development had been designated as “non-actionable subsidies” (meaning they are permitted) in the WTO's subsidies agreement, thus enabling countries with the resources to provide enormous subsidies to their enterprises and to give them a competitive advantage, while most developing countries do not have the resources to provide R&D in significant amounts. This designation expired in 2000. However, while R&D subsidies are no longer allowed when limited to specific enterprises, they are allowed if given to industries across the board. Developing countries have been unable to compete with regards to R&D grants because of their lack of funds, and are also constrained due to the WTO rules from using many other types of subsidies that were used by developed countries when they were in their development phase. An even bigger imbalance is that agricultural subsidies are exempted from the strict rules of the subsidies agreement, and much more lenient

treatment is provided to this sector, allowing developed countries to continue to maintain hundreds of billions of dollars of agricultural subsidies each year. The developing countries have proposed as part of the Doha negotiations that the subsidies they provide be considered “non actionable” (i.e. that they be permitted) for certain purposes, including for environmental protection. WTO Members were urged to refrain from taking complaints against developing countries while the negotiations on the proposal are taking place.⁶ Amending the WTO rules in this direction would be helpful. However a complaint has been taken against a developing country for subsidies provided to resident companies producing renewable energy.

Environmental standards

Another potential problem is the adoption of environmental standards for products; developing countries that are unable to meet the standards face the prospect of losing their exports. The approach towards developing countries should be to provide resources and technology for upgrading their environmental technology and standards, and not to penalise them. The full and effective participation of developing countries in setting international standards is also needed as many important standards are currently “globalised” from those of developed countries without the concomitant support to developing countries to assist them to comply with such standards.

New conditionality

Another risk is that the “green economy” may be used as new conditionality on developing countries for aid, loans, and debt rescheduling or debt relief. This may pressurise affected developing countries to take on one-dimensional environmental measures rather than sustainable development policies that take economic and social development and equity goals into account.

⁶ WTO 2001a, para. 10.2.

III. POLICIES AND MEASURES FOR PROMOTING SUSTAINABLE DEVELOPMENT AND GREEN ECONOMY

In operationalising the Green Economy concept, the three aspects of sustainable development (environmental, economic and social) should be incorporated, to obtain a multi-dimensional outcome.

The following are some measures and policies that can be taken to promote a more environmentally-sound economy in the context of sustainable development:

- Recognising the economic and social value of environmental resources.
- Conserving resources as well as rehabilitating damaged environments and eco-systems
- Enabling prices to better reflect their environmental value, while also enabling ordinary people and the poor to access basic goods and services.
- Government promotion of environmental objectives through financial, industrial and technological policies and measures, including subsidies, incentives, use of government investment and budget, and placing limits to pollution and over-use of resources through regulation and other policies.
- Regulating the market.
- Recognising the link between livelihoods and living conditions of small rural producers and communities and the environment.
- Promotion of sustainable consumption and lifestyles.
- Food security, rural livelihoods and sustainable agriculture.
- Strengthening international policies and mechanisms to support developing countries' policies and efforts towards sustainable development.

Recognising the economic and social value of environmental resources

It is crucial for policy makers and the public to recognise the economic and social value of the environment, that conserving resources such as clean air, water, forests, mangroves, etc have positive externalities which are valuable for meeting basic and human needs besides having their intrinsic environmental worth. Conservation should thus be promoted, and there should be investments on rehabilitation of damaged natural resources.

Recent studies have compared the benefits of conserving or sustainably using natural resources, with the benefits such as revenues from using or exploiting the resources in a way that maximises short-term profits at the expense of the environment.

The Millennium Ecosystem Assessment pointed out that biodiversity (such as forests and mangroves) provided various “services” contributing to human well-being, including provisioning services (foods, crops, water, medicines), regulating services (filtration of pollutants by wetlands, climate regulation, pollination and protection from disasters), supporting services (soil formation, photosynthesis, nutrient cycling), and cultural services (recreation, education, spiritual and aesthetic values). Maintaining or augmenting the stocks of natural resources enables the

continuous flows of these ecological services, whilst depleting stocks imply reduced flows of services in future, with adverse effects on human well-being.

The science of valuing the services of natural resources enables cost-benefit analyses of various actions or activities. The following are examples of the importance of the economic value of conserving (or sustainably using) various resources:

- The Muthurajawela Marsh coastal wetland in North Sri Lanka was estimated in a 2003 study to provide provisioning services (for agriculture, fishing, firewood) contributing to local incomes (at a value of US\$150 per hectare per year), as well as industrial and domestic wastewater treatment (\$654) and flood attenuation (\$1907), as well as carbon sequestration. (UNEP, TEEB, 2009).
- A 2007 study in Southern Thailand on conversion of mangrove into commercial shrimp farms showed net private economic returns of US\$1220 per hectare per year, while the cost of restoration after the pond is abandoned after 5 years of exploitation was \$9318 per hectare. But the estimated benefits of retaining the mangroves instead (which would accrue mainly to local communities) totaled US\$12,392/ha, comprising \$584/ha for collected forest products, \$987/ha for providing nursery for off-shore fisheries and \$10,821/ha for coastal protection against storms. (UNEP, TEEB, 2009).
- The Te Papanui Conservation Park in New Zealand provides the Otago region with water for free that would cost NZ\$136 million if the water is brought in from elsewhere. The park is a natural water catchment supplying NZ\$31 million of water flows for hydroelectricity, NZ\$93 million for urban water supply and NZ\$12 million for irrigating 60,000 hectares of farmland. (UNEP, TEEB, 2009).
- Halving deforestation rates by 2030 would reduce global greenhouse gas emissions by 1.5 to 2.7 Gigatonnes of carbon dioxide (CO₂) per year, thereby avoiding damages from climate change estimated at US\$ 3.7 trillion in net present value terms. (This does not include the many other benefits of forest ecosystems). (UNEP, TEEB, 2010).
- The over-exploitation of fish stocks has reduced income from global marine fisheries by US\$50 billion annually compared to a more sustainable fishing scenario, according to the World Bank and the Food and Agriculture Organization (FAO) 2009 study. (UNEP, TEEB, 2010).

Conserving resources and restoring damaged environments and eco-systems

The previous section has shown the benefits of conserving natural resources because of the economic and social value of the “services” they contribute to human well-being, besides their intrinsic ecological worth. However there should also be recognition of the opportunity cost of not “exploiting” or using up the resources. The short term usefulness of using Nature and the short and long term usefulness of conserving Nature (or making use of resources sustainably) should be both recognised and reconciled, and international support should be made available to developing countries in offsetting the opportunity costs.

One interesting proposal from a developing country for sharing the opportunity costs of conserving natural resources is the Yasuni Initiative of Ecuador, in which the country is willing to forgo the benefits of oil revenues in order to preserve a biodiversity-rich large tract of forest (Khor, 2010c). In the proposed scheme, the government would maintain the crude oil field located in the Yasuni National Park (an important biological reserve) indefinitely underground, in order to prioritise social and environmental values, while other ways would be found to obtain economic benefits for the country. The park covers a million hectares and the oil field is about 20 per cent of the area. Under the initiative, the international community would contribute half the revenue that the State would have received by extracting the oil, while the government would assume up to half of the opportunity cost of keeping the oil in the ground. According to government estimates, the recoverable oil reserves are estimated to yield revenues of US\$7.25 billion (at present value) to the state. Leaving the oil in the ground would conserve the Park, while also avoiding an estimated 407 million tonnes of carbon dioxide emissions that would have been generated by burning the oil. Ecuador has proposed that the international community contributes at least US\$3.6 billion into a trust fund administered by the United Nations Development Programme (UNDP). While the government would forgo \$3.6 billion of the total revenues, the fund's capital will be invested in renewable energy projects and the interest from the fund would be used to conserve forests in 44 protected areas, help small farmers reforest and manage a million hectares of forests, promote energy efficiency and social development. Ecuador hopes that the UNFCCC will recognize "keeping oil in the ground" as another method to avoid emissions and which can provide funds for developing countries and that the Yasuni Initiative can be an example of a mechanism to assist developing countries to leave fossil fuel reserves located in environmentally or culturally fragile areas underground indefinitely.

The issue of meeting or sharing the opportunity costs of conserving natural resources should be addressed, so that conservation becomes a more prevalent part of national policies.

Public expenditure on restoring damaged ecosystems (such as forests, hillsides and water catchment areas, mangroves) is also important. This is because the ecosystems have many valuable functions such as provision of water supply, soil retention, flood control, mitigation of extreme weather events. Damage to the ecosystems has been significant in many countries and regions, thus resulting in reduced water stocks and flows, soil erosion, silting of rivers, flooding, exposure to coastal storms, and increased Greenhouse Gas emissions. Restoration of the "natural capital" would reduce the adverse effects and enable the resumption of the environmental services. More work should be undertaken on the methods and impacts of such ecological restoration. However, in many developing countries, there is a lack of financial resources to undertake ecological restoration on the scale needed, and thus international support is necessary.

Enabling prices to better reflect their environmental value, while ensuring access to basic goods and services

A major challenge in sustainable development (and thus of any green economy initiative) is to reconcile the two principles of allowing prices to better

reflect their environmental values, while ensuring access of the public (especially the poor) to basic amenities and basic livelihood opportunities. Thus the environmental dimension and the social dimension (including satisfaction of basic needs, and social equity) have to be incorporated.

The over-exploitation of natural resources, and related wastage, is promoted by the low prices of natural resource-based products such as water and wood. This under-pricing could be due to the prices not being able to incorporate or fully incorporating the cost of adverse side effects during production (such as pollution, resource over-exploitation and depletion, and health effects), or because of subsidies, or other factors.

In both cases of a failure of market prices reflecting real environmental values, the state has the key role in rectifying the problem. In general, prices should better reflect the environmental values, including the incorporation of the costs of adverse effects. Environmental taxes should be used, as well as pricing policy relating to public services. However this should be done in a manner that does not penalise the poor and ordinary people, especially when the products or services concerned are essentials.

Thus, if water is generally underpriced, then in a revaluing of the price of water provided by the state, a system of differential pricing that is sensitive to ensuring access for the poor could be instituted. The first block of water for households in a quantity essential for family use may be charged at an affordable rate, with higher rates at subsequent blocks; the water supplied to hotels and industries could be at higher rates; and in developing countries community water in poor areas may be provided free. Overall, the price of water should better reflect their ecological values, while there can be subsidisation for the poor or for essential use.

The removal or reduction of subsidies for environmentally damaging activities or products has also been strongly advocated. However, this should be undertaken with the principle that it should not affect affordable access of the poor to essentials such as energy or food, or affect their livelihoods adversely. For example, it has been argued that subsidies provided to the fishing industry have contributed to over-fishing and rapid depletion of fish stocks. In the WTO, negotiations are taking place to discipline fishery subsidies. However, many developing countries have argued the case that exemptions or more lenient treatment be given to these countries at least for subsidies that are provided for their fishing sector that is characterised by small-scale and artisanal fisherfolk. In another case, if subsidies for fossil fuels are reduced or eliminated (as being proposed in the Group of 20 (G20) process) this should be done in a manner that does not adversely affect the access of the poor to energy.

On the other hand, incentives (subsidies, access to credit, tax breaks, etc) should be provided to producers and consumers to promote good production processes and products (renewable energy, sustainable agriculture, no-emissions cars). For developing countries, the provision of subsidies and other incentives to promote environmentally friendly industries and practices is particularly important, since many or most of such industries and practices would be new to the countries.

A potential barrier for developing countries is the subsidies agreement in the WTO, which has considerably reduced the policy space of developing countries on the types of subsidies they are able to provide. The complaint taken against China in 2011 at the WTO regarding the legality of its subsidies provided for wind energy companies may create an atmosphere of uncertainty to developing countries seeking to promote climate friendly industries and technologies. Meanwhile, many developed countries provide research and development grants to their companies, the total running into billions of dollars. It is not so clear to many developing countries what kinds of subsidies are permitted and what are prohibited and “actionable”. It appears that many types of subsidies used by developed countries during their development phase are now unable to be used by developing countries in the industrial sector. However, many subsidies are still allowed in agriculture, and these are used mainly by developed countries, which is another imbalance. In view of the imperative of having a transition to a green economy, it is important to review the subsidies rules in the WTO.

In fact, developing countries have proposed that they be given an exemption on some of the prohibited subsidies, including on environmental grounds. As part of the documents that launched the current Doha negotiations, the proposal of developing countries to expand the list of non-actionable subsidies for them was included for consideration.⁷ The decision taken by the WTO's 2001 Doha Ministerial Conference was to “take note of the proposal to treat measures implemented by developing countries with a view to achieving legitimate development goals, such as regional growth, technology research and development funding, production diversification and development and implementation of environmentally sound methods of production as non-actionable subsidies.” It agreed that the issue be addressed as an outstanding implementation issue, and added: “During the course of the negotiations, Members are urged to exercise due restraint with respect to challenging such measures.” As the Doha negotiations are still proceeding, the “due restraint” clause is still in place. This proposal should be taken seriously.

The critical role of the public sector

The sections above have argued for the important roles of government to use policy tools such as regulation, pricing policies, taxes and subsidies to limit pollution and emissions and to control over-exploitation of natural resources; and to make prices better reflect environmental values, whilst protecting the access of the poor to essential goods and services.

Besides these regulatory functions, the state has also an important role in strategic policy-making in re-orienting various economic and social sectors towards a sustainable development pathway. This is especially so in developing countries, where the state traditionally has a strong developmental role, and now has to take on a sustainable development role, in which production patterns have to be oriented towards environmentally sound patterns, while still ensuring economic growth and social development. As argued by the United Nations Department of Economic and

⁷ This decision is contained as para. 10.2 in WTO (2001a). This point on subsidies and the developing countries' proposal is also mentioned in UNCTAD's paper on the Green Economy (UNCTAD, 2010).

Social Affairs (UNDESA) (2009), in relation to climate change and economic policies, the response to climate change in developing countries will be a vastly more daunting challenge than those confronting developed countries and in a far more constrained environment, since much of the atmospheric space has been used up already (and mostly by developed countries).

Since economic growth is an imperative, including for poverty eradication, the question is whether high growth in developing countries can be combined with lowering the emissions trajectory. DESA argues it is feasible because the technologies exist but such a switch entails unprecedented and potentially very costly socio-economic adjustments in developing countries. This switch will require a high level of international support and solidarity to boost finance, technology and institutional capacity in developing countries, capable of raising investment levels and channeling resources towards lowering the carbon content of economic activity and building resilience to unavoidable climate changes.

On the mix of market and non-market measures, there may be a difference between developed countries (which may give a greater role to market mechanisms, taxes and regulations) and developing countries which need to emphasise public investment and industrial policies, managed by a developmental State.

The level and content of investments influence the rate and content (or composition) of economic growth. The DESA report advocates a significant role for public investment in developing countries in triggering growth and crowding in private investment along a new development path. Reducing greenhouse gas emissions will require large and interconnected investments across several sectors. Most important is the energy sector: developing countries need to expand energy infrastructure and make energy services widely available at affordable prices especially to the 1.6 billion people (mainly the rural poor) without access to electricity and 2 billion without access to modern energy.

Large investments have to be made up-front in new carbon-saving technologies, with the public sector playing a leading role, at least in the early stages. Governments need to take the lead in a big push towards environmentally cleaner and more resilient economies, through policies, combining large investments, price signals and regulatory measures. Because the costs of some environmentally sound technologies (such as renewable energy sources) are presently more expensive, the government has to promote these technologies through subsidies, feed-in tariffs and other measures.

Developing countries also need to adopt adaptation measures to avoid or cope with climatic and weather events, which can have devastating effects, as the recent floods in Pakistan, Sri Lanka and many South American countries have demonstrated. These have adverse effects especially on poor communities. Large-scale adaptation projects in both the rural and urban sectors, with significant support from international climate financing, can contribute to job creation and economic growth.

Besides investments, the switch to a sustainable pathway also requires governments to adopt an industrial policy which also incorporates sustainable development principles and practices. The industrial policy includes selection of

sectors to promote in industry (as well as agriculture and services), and includes measures such as subsidies and access to credit to producers, as well as trade and technology policies that are supportive of the production.

One specific proposal in the DESA report is the establishment of a global feed-in tariff programme in the energy sector.⁸ In a feed-in tariff scheme, utility companies are obliged to pay agreed prices or tariffs to renewable energy suppliers and to “feed” the renewable energy into the national grid. This induces investments in renewable energy. This scheme is now used by 45 countries or States within some countries around the world. In the proposed global scheme, guaranteed prices (with a small profit margin) are given to producers of renewable energy, who thus have the incentive to invest. The prices paid to the suppliers are initially higher per unit of electricity than those produced from non-renewables; but the price for consumers in developing countries is low enough to enable affordable access to the poor. The difference in the two prices is a subsidy financed by an international fund financed by developed countries. After some years, production costs of renewables are cut (including because of economies of scale from large-scale production) and the subsidies are no longer needed, while renewable energy sources become competitive with other sources. This scheme meets the sustainable development criteria of environmental sustainability, social development and economic growth.

The role of government to address the climate change crisis as described above should also apply to other areas, such as public investment for promotion of biodiversity, conservation and sustainable use of natural resources, and the restoration of degraded resources and ecosystems.

Regulating the market

Another major issue in considering the “green economy” is the need for regulating markets and corporations. Although the private sector has an important role to play in the shift to sustainable development and to a green economy, they should operate within the framework of government regulation and policies.

Markets and companies left to themselves have been unable to take a sustainable development pathway. Indeed, much of the pollution, extraction and depletion of resources in the world have been the result of activities of companies, especially the big companies. Companies have to operate in an intensely competitive environment, with imperatives to minimise costs and maximise profits, with the short-term being the critical horizon. Governments have to establish the frameworks of regulation, incentives and disincentives, so that corporate practices are aligned to environmental, social and developmental objectives. The Stern Report (2006) termed the climate change crisis as “the greatest market failure the world has ever seen.”

Thus, regulation of the private sector, especially the large companies, is important. Regulatory mechanisms such as limits to pollution and emissions, pesticides in food, water contamination, and use of environmental taxes and fines, are

⁸ Details on the feed-in tariff scheme are in DESA 2009 and Hallstrom N. 2011.

thus seen as crucial policy instruments that should be major or central components to promoting the “green economy”.

However, there is also an increasing trend instead of creating and relying on “markets” whereby companies (and countries) can pollute beyond their assigned limit by buying pollution or emission certificates from other companies or countries. Such markets for buying and selling “pollution rights” are increasingly seen as an alternative to companies or countries having to take their own adequate action, and to pass the action on to others. There is an increasing body of criticisms about this trend, including the avoidance by developed countries and their companies from environmental action, the problems including fraudulent practices in the workings of these markets, the dangers to both the environment and to social development of turning Nature and natural resources into commodities, and dangers of creating new financial speculative instruments.

It should thus be recognised that while there is an interest in learning about the use of pricing mechanisms, taxes and payment for entrance of cars into urban centres, there is also a debate on the appropriateness and effects of the use of “markets” for pollution permits or for “offsetting” in the implementation of environmental commitments.

Addressing the link between livelihoods and living conditions of rural communities and the environment

There is a particularly strong link between the rural poor and the environment. They live close to the natural environment and depend on land, water and forest and marine resources for their livelihoods. Their housing materials and utensils, and sources of water, food and energy, come directly from natural resources. Thus, the deterioration of the natural environment has an almost immediate and drastic impact on their living conditions and livelihoods.

Conserving natural resources in places where poor communities live is thus an important component of sustainable development. This environment has been increasingly encroached upon, and the competing use of the resources by commercial interests has often left the poor communities at a disadvantage, with losses to their livelihoods and incomes, and deterioration of their water supply. Examples include indigenous people losing their forests to timber and mining companies undertaking extraction activities; fishing communities losing their mangrove forests due to commercial aquaculture or losing their fishery resources due to over-fishing by large trawling boats or huge fishing ships; and local communities suffering from contamination of their rivers and land by industrial wastes.

The concept of sustainable development and of green economy should incorporate the right of rural communities to a clean environment that enables them to have a sound basis for their livelihoods and their living conditions. A rights based approach is important, that can include the rights to work, to food and health and the new rights to water and sanitation, and the United Nations Declaration on the Rights of Indigenous Peoples.

Climate change and extreme weather events also affect the poor most severely. The recent series of floods caused by heavy rains in many countries mainly affects those living in rural areas. One of the most serious potential effects of global warming will be the lower productivity of agriculture in developing countries. Seawater rise will also have effects mainly on coastal populations

At the same time, poor rural communities should also be the main beneficiaries of sustainable development, and the green economy. About 1.6 billion people do not have access to electricity, and many rural dwellers do not have access to clean water and sanitation. The degraded resources have also caused a deterioration in their living conditions. Thus, sustainable development and green economy strategies should prioritise policies and projects that benefit them. These include prohibition of activities that damage the environment and livelihoods of the poor communities (unless they are provided with alternative land and housing of equally good quality); restoration of ecosystems; support for sustainable agriculture activities; large government investments in renewable energy, water and sanitation programmes as well as improved education and health services.

On the other hand the interests of poor rural communities should not be adversely affected in the name of the Green Economy. For example local communities should not be forced to leave their homes in the forests when such forests are declared conservation parks. In the building of big hydro-electric dams, now often done in the name of renewable energy, large numbers of forest dwellers have been relocated, often without being given equally good sources of livelihood and living conditions or adequate compensation. Also, biological resources of local communities have been misappropriated either through physical removal of plants, or through patenting of the resources and the traditional knowledge associated with their use; these resources are often converted into “natural” or “nature-based” products.

Addressing unsustainable consumption patterns and its link to environment, poverty and equity

UNCED acknowledged the need to reform existing patterns of consumption and production in order to meet sustainable development objectives, thus leading to the call for measures to lead to sustainable patterns of production and consumption. It recognised the link between poverty and unsustainable patterns of production and consumption. According to Agenda 21 (para. 4.3), “poverty and environmental degradation are closely interrelated; while poverty results in certain kinds of environmental stress, the major cause of the continued deterioration of the global environment is the unsustainable patterns of consumption and production, particularly in industrialised countries, which is a matter of grave concern, aggravating poverty and imbalances.”

However, while there has been much discussion on making production patterns and systems more environmentally efficient, there has been less focus on consumption patterns. This should be rectified as consumption patterns often drive the pace of production and greatly influence the composition of the good and services produced. A more rational pattern of consumption can result in a more rational pattern of production.

Consumption patterns are in turn highly influenced by the distribution of incomes worldwide and within countries. Due to the unequal distribution of income in the world, a large share of goods and services produced are luxuries that the wealthy are able to pay for, while the poor who have needs but are unable to pay lack basic goods and services such as housing, clean water, sanitation, basic education and food.

Agenda 21 understood and acknowledged this point, stating that “special attention should be paid to the demand for natural resources generated by unsustainable consumption...although consumption patterns are very high in certain parts of the world, the basic consumer needs of a large section of humanity are not being met. This results in excessive demands and unsustainable lifestyles among the richer segments, which place immense stress on the environment. The poorer segments, meanwhile, are unable to meet food, health care, shelter and educational needs. Changing consumption patterns will require a multipronged strategy focusing on demand, meeting the basic needs of the poor, and reducing wastage and the use of finite resources in the production process” (para. 4.5).

Since UNCED 1992, there has not been much progress in changing the unsustainable consumption patterns despite the adoption of the Marrakech 10-Year Framework of Programmes on Sustainable Consumption and Production, that is under review by the Commission on Sustainable Development in its annual sessions in 2010/2011. In the past two decades, a large part of the world's resources have continued to be channeled towards luxury projects, goods and services, while there has been an alarming increase in the depletion and pollution of the world's natural resources. Much of the discussion on making consumption and production patterns more sustainable has been on reducing the energy and materials used per unit of production, minimising the generation of wastes, and making consumers aware of environmentally sound purchasing choices. These are laudable objectives; however the core problem of income inequality has not been resolved but in many countries it has become more acute, with a larger share of national income accruing to a small percentage of the population.

This has several implications. While there is more potential to increase the productivity per unit of natural resources used, this is done within the same or worse income distribution pattern; thus the rich may consume the same luxury products and services and in larger numbers though each unit may be more energy-efficient. Because of the same distribution pattern, the poor still do not have access to basics. Thus, an improvement in the pattern of income distribution is required if sustainable development objectives are to be met. The equitable distribution of income as a goal becomes more urgent as resources are being depleted to critical levels, and as the “atmospheric” space for Greenhouse Gases is fast vanishing. In this situation of environmental crisis, the irrationality of existing consumption patterns becomes even more evident.

Improving income distribution requires public policy and government intervention, as the market left to itself would continue to produce according to the pattern of demand which in turn is influenced by the pattern of income distribution. At the international level, measures are needed to develop a more balanced and

equitable economic, trade and financial system. This has to be accompanied meanwhile by transfers of financial resources and technology, as well as redistributive methods such as Official Development Assistance (ODA). At the national level, measures are needed to foster more equitable patterns of wealth and income distribution, including through land reform, better wages, and a budgetary system of taxes and expenditure oriented to improving the livelihoods and living conditions of rural communities and the urban poor, as well as pro-poor and pro-employment growth.

Food security, rural livelihoods and sustainable agriculture

The integral nature of sustainable development can be shown in addressing the inter-related issues of food and agriculture. The right to food is an essential human right, thus underlining the importance of access of people, especially the poor, to food, as well as the important priority that developing countries place on food security. The present inflation of food prices to almost record high levels lends urgency to the issue. At the same time, billions of people depend on agriculture for their livelihoods and incomes. The environmental factor is also crucial, to enable agriculture to be environmentally sustainable. These are issues that encompass trade and economic policies, social development and environmental policies.

In recent years there was complacency about food security and national self-sufficiency, as it was thought that cheaper imports would be always or usually available, and local food production was not so necessary as previously thought. Many developing countries reduced food production, many of them under advice of the international financial institutions. The rising world prices of many food prices have meant more expensive imports, and inflation of food prices in local markets, leading to social instability. For many developing countries, the meaning of “food security” has shifted back to the traditional concept of greater self-sufficiency and increased local food production. This raises the question of what constitute the barriers to local production and how to remove these barriers.

An important factor is the decline of agriculture in many developing countries due to structural adjustment policies, which dismantled institutions and policies that assisted farmers in marketing, credit, subsidies and infrastructure and which drastically reduced agricultural tariffs. Many countries that were net exporters or self-sufficient in many food crops experienced a decline in local production and a rise in imports, some of which are heavily subsidised. The effects on farm incomes, on human welfare, on national food production and food security were severe. The high agricultural subsidies in developed countries affect developing countries by enabling cheap exports to penetrate the poorer countries' markets, disrupting local production; by preventing access to the rich countries' markets; and by out-competing developing countries' products in third markets. In 2009 the agricultural subsidies of the Organisation of Economic Co-operation and Development (OECD) countries (measured by total support estimate, i.e. subsidies to farm producers, general services support and consumer support) totalled \$384 billion, compared to \$362 billion in 2007 (OECD, 2009, 2010).

Several studies have shown that the high subsidies enable many agricultural products to be sold at below the cost of production. For example, in 2000-2003 the average costs of production and milling of US white rice was US\$415 per tonne, but it was exported for just \$274 per tonne, or 34 per cent below its costs. This enables US rice to sell in many countries and reduce the local production in some. In 2002, 15 European countries exported poultry meat at an average of Euro 809 per tonne. It is estimated that the total subsidy on exported poultry was Euro 254 per tonne. Between 1996 and 2002, EU frozen chicken exports to West Africa rose eight fold, due mainly to import liberalization. In Ghana, the half million chicken farmers have suffered from this situation. In 1992, domestic farmers supplied 95 per cent of Ghana's market, but this share fell to 11 per cent in 2001, as imported poultry sells cheaper (Khor, 2008b).

The plight of the small farmers in developing countries should be addressed through a combination of policies supporting agriculture in developing countries (through investments, subsidies, marketing and an appropriate trade policy that defends the farmers from cheap imports); and through international trade reform that sufficiently reduces or removes harmful subsidies in the developed countries, while enabling developing countries to have special treatment and safeguard mechanisms to promote their small farmers' livelihoods. The WTO rules and the proposed Doha framework, as well as the provisions in many bilateral trade agreements fall short of these goals.

Agricultural reform is also needed to take into account climate change. On one hand, climate change is predicted to adversely affect agriculture productivity in developing countries. Countries such as Chad, Ethiopia, Nigeria, Somalia, Sudan and Zimbabwe could lose cereal-production potential by 2080; in Latin America there are generalised reductions in rice yields by 2020; and cereal yields could decrease by 30 per cent by 2050 in South Asia. (Nyong, 2009, p. 47) According to the report of the Independent Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), climate change can irreversibly damage the natural resource base on which agriculture depends. Water scarcity and the timing of water availability will increasingly constrain production. Climate change will require a new look at water storage to cope with the impacts of more and extreme precipitation, higher seasonal variations and increased rates of evapo-transpiration in all types of ecosystems. Extreme climate events (floods and drought) are increasing and are likely to adversely affect food and forestry production and food security. (IAASTD, 2008)

On the other hand, agriculture is a major contributor to climate change. Agriculture is the main emitter of nitrous oxides and methane. The total global contribution of agriculture (direct and indirect emissions) is between 8.5 to 16.5 billion tonnes of carbon dioxide equivalent, representing 17 to 32 per cent of all global human-induced Greenhouse Gas emissions, including land use changes (Greenpeace, 2008). Conventional and intensive agriculture characterized by mechanization and use of agro-chemicals (mineral fertilizers, herbicides, pesticides) and reliance on high external inputs (chemicals, irrigation, fossil fuels) have led to high environmental and social costs that may undermine future capacity to maintain required levels of food production.

Agriculture has significant mitigation potential. According to Greenpeace, the overall mitigation potential is 6 billion tonnes a year, which is close to all of agriculture's direct emissions. The greatest potential mitigation contributions are from soil carbon sequestration (5.38 billion tonnes annually), reduction of methane emissions (500 million tonnes) and nitrous oxide emissions (120 million tonnes). Mitigation actions can include cropland management, grazing land management, restoration of organic soils and degraded lands to increase carbon sinks, improved water and rice management; set-asides, land use change and agro forestry; increasing efficiency in manufacturing of fertilizer; consumer behaviour change, in eating less meat.

In April 2008, the IAASTD launched its report in Johannesburg, which was approved by 57 governments. The IAASTD was an inter-governmental process, co-sponsored by FAO, UNDP, the United Nations Environment Programme (UNEP), the Global Environment Facility (GEF), World Bank, with over 400 authors involved in drafting the report. It conducted a three-year evidence-based assessment on agricultural science and technology and on the future of agriculture. It made a critique of conventional industrial farming and called for a fundamental change in farming practices so as to better address increasing food prices, hunger, inequities and environmental crises. The report reflects a growing consensus among scientists and many governments that the old paradigm of industrial energy-intensive and toxic agriculture is an outdated concept, while small-scale farmers and agro-ecological methods provide the way forward.

Its conclusion was that the past emphasis on production and yields brought some benefits. This was at the expense of the environment and social equity. While promoting agro-ecological methods, it did not support genetically modified crops, preferring to highlight the doubts and uncertainties surrounding them, rather than the claimed benefits. The report concluded that for poor farmers, genetically modified crops are unlikely to play a substantial role in addressing their needs, and longer-case assessments of the environmental and health risks and regulatory frameworks are needed. (Lim, 2008)

A report by the International Trade Centre (ITC) and FIBL (Research Institute of Organic Agriculture, Switzerland) provides a detailed assessment of the benefits of organic farming regarding climate change. The benefits include organic agriculture's considerable potential for reducing emissions; it contributes to better adaptation of agriculture under unpredictable climatic conditions with higher temperatures and uncertain precipitation levels; organic production methods emphasizing soil carbon retention are most likely to withstand climatic challenges; soil erosion, an important source of carbon dioxide losses, is effectively reduced; organic farming can contribute substantially to agro forestry production systems; and organic systems are highly adaptive to climate change due to the application of traditional skills and farmers' knowledge, soil fertility-building techniques and a high degree of diversity.

The study concludes that: "Within agriculture, organic agriculture holds an especially favourable position, since it realizes mitigation and sequestration of carbon dioxide in an efficient way...Organic production has great mitigation and adaptation potential, particularly with regard to soil organic matter fixation, soil fertility and water-holding capacity, increasing yields in areas with medium to low-input

agriculture and in agro-forestry, and by enhancing farmers' adaptive capacity. Paying farmers for carbon sequestration may be considered a win-win-win situation as (a) carbon dioxide is removed from the atmosphere (mitigation); (b) higher organic matter levels in soil enhance their resilience (adaptation), and (c) improved soil organic matter levels lead to better crop yield (production)."

Moreover in some areas, organic farming performs better, for example in conditions where there are water constraints. Yields from organic agriculture where water is limited during the growing period, and under subsistence farming, are equal or significantly higher than those from conventional agriculture. The ITC report cites a comparison of 133 studies from developing countries concluded that organic plant and livestock yields were 80 per cent higher than their conventional counterparts, and for crops only the yield increase was 74 per cent (Badgley et al., 2007).

Another review of sustainable agriculture practices, covering 208 projects in 52 countries, show that 9 million farmers have adopted sustainable agriculture practices on 29 million hectares in Africa, Asia and Latin America (Pretty and Hine, 2001, cited in Lim, 2003). Farmers have achieved substantial increases in food production per hectare: 50-150 per cent for rain-fed crops; 5-10 per cent for irrigated crops.

Given the climate-agriculture linkages, there should be more research and action on adaptation measures in agriculture, especially in developing countries in order to assist farmers in developing countries to reduce the adverse effects of climate change on agriculture. There should also be research on mitigation action plans. Financing assistance for adaptation and mitigation measures in the agriculture sector in developing countries should be prioritized. Given the many advantages of organic farming and sustainable agriculture, in terms of climate change as well as social equity and farmers' livelihoods, there should be a much more significant share of research, personnel, investment, financing and overall support from governments and international agencies that should be channeled towards sustainable agriculture.

The sustainable development framework can usefully incorporate all the various key aspects of the food-agriculture-trade-environment nexus, as described above. It is a test for the Green Economy concept whether it also has the methodology and the conceptual base to encompass the same comprehensive approach.

Strengthening international policies and mechanisms to support developing countries' policies and efforts towards sustainable development

At the international level, systems and mechanisms should be established or strengthened for developed countries to support and enable developing countries. These would include the provision of adequate financing, and through appropriate financial mechanisms; and technology transfer, which includes the promotion of endogenous environmentally-sound technology in developing countries.

Reforms and improvements should be made in the global economic frameworks, structures and processes with the view to enable and support developing countries in the transition to sustainable development processes and models. Reviews

and reforms in trade rules (multilateral rules as well as regional and bilateral free trade agreements) are required, for example, in the areas of reducing developed countries' agricultural subsidies, reviewing industrial subsidies to enable developing countries to promote environmentally-sound practices or products such as renewable energy, establishing appropriate intellectual property rules that enable access to environmental technologies at affordable cost, etc. On finance, mechanisms for the provision of adequate and appropriate types of financing to developing countries for sustainable development policies and measures should be established.

IV. TECHNOLOGY DEVELOPMENT, TRANSFER AND COOPERATION

If developing countries are to succeed in moving to an environmentally-sound economic growth pathway which also incorporates social development, they require access to environmentally-sound technology at affordable prices.

The central role of technology transfer to developing countries as well as the development of endogenous technology in these countries was recognised in the 1992 Rio Summit, as well as in its related conventions. Given the emergency situation emerging from the environmental crisis, it was recognised that technology transfer had to be undertaken beyond the commercial arena, and that a pro-active role of public policy at national and international levels is required to enable developing countries' access to technology.

Thus, technology transfer was one of the two key “means of implementation” in Agenda 21, the other being financial resources. Chapter 34 of Agenda 21 defines environmentally sound technologies in a comprehensive way as not just individual technologies but total systems that include know-how, procedures, goods and services, equipment and organisational and managerial procedures. Thus technology transfer should also address human resource development and local capacity-building aspects of technology choices. It states the principle of the need for favourable access to and transfer of environmentally sound technologies to developing countries through technology cooperation enabling transfer of technological know-how and building up of economic, technical and managerial capabilities for the efficient use and further development of transferred technology.

The UNFCCC also recognises technology development and transfer in several provisions, including article 4.3 (developed countries shall provide financial resources including for technology transfer needed by developing countries to meet their agreed full incremental costs of implementing measures), article 4.5 (developed countries shall take all practicable steps to facilitate and finance transfer of and access to environmentally sound technologies and know-how particularly to developing countries; and shall support the development and enhancement of endogenous capacities and technologies of developing countries) and article 4.7 (the extent to which developing countries will implement their commitments will depend on effective implementation of developed countries' commitments on financial resources and technology transfer).

Despite the recognition of the central role of technology transfer, there has been in fact little transfer of climate-friendly technology under the UNFCCC. This implementation gap is sought to be rectified. It was agreed under the Bali Action Plan (adopted in December 2007) that developed countries would provide technology support to developing countries in a measurable, reportable and verifiable manner. An executive committee on technology is in the process of being established under the UNFCCC to address technology transfer issues.

Technology transfer is not merely the import or purchase of machines and other hardware at commercial rates. A central aspect of technology development and transfer is the building of local capacity so that people and institutions in developing

countries can design and make technologies which can be diffused into the domestic economy. As recognised in Agenda 21 (para. 34.12), a “critical mass of research and development capacity is crucial to the effective dissemination and use of environmentally sound technologies and their generation locally”.

In the first phase of technological development, developing countries can go through three stages: (1) initiation stage, where technology as capital goods are imported; (2) internalisation stage, where local firms learn through imitation under a flexible intellectual property rights (IPRs) regime; (3) generation stage, where local firms and institutions innovate through their own research and development (R & D) (UNCTAD, 2007).

In stage 1, the country is dependent on capital imports, some of which may be extra high in cost (those that are patented) because of the higher prices enabled by monopoly margins. In stage 2, costs may be lowered by versions produced locally. In stage 3, the local firms are able to design and make their own original products. Technology transfer may involve the purchase and acquisition of equipment; the know-how to use, maintain and repair it; the ability to make it through “emulation” or reverse engineering; to adapt it to local conditions; and eventually to design and manufacture original products. The process of technology transfer involves progressively climbing through all these aspects.

Several conditions have to be present for technology transfer and development to take place. The absence of such conditions can form barriers to technology transfer. Among the barriers that are normally listed are poor infrastructure, inadequate laws and regulations, shortage of skilled personnel, lack of finance, ignorance of technology issues, high cost of certain technology agreements, problems created by equipment suppliers, and intellectual property rights.

Whether IPRs constitute a barrier or an important barrier depends on several factors, such as whether or not the particular technology is patented, whether there are viable and cost-effective substitutes or alternatives, the degree of competition, the prices at which it is sold, and the degree of reasonableness of terms for licensing, etc. Some technologies are in the public domain; they are not patented or their patents have expired. According to Agenda 21 (para. 34.9), a large body of technological knowledge lies in the public domain (are not covered by patents) and there is a need for the access of developing countries to such technologies as well as the know how and expertise required to use them. In this case, the main barrier to technology transfer may be lack of financial resources, and international funds should be established to enable developing countries to purchase and to manufacture such technologies.

An important measure to promote sustainable development is to expand the space for technologies in the public domain, and to expand the transfer to developing countries of publicly-funded technologies. Governments in developed countries play an important role in funding R & D programmes, many of which are implemented by the private sector. In addition, governments sponsor a range of R & D that underpin private sector investments in developing environmentally sound technologies (ESTs) (IPCC, 2000, Chapter 3, page 95). A paper for the UNFCCC surveyed government R & D funding of ESTs in the US, Canada, United Kingdom and Korea. It found that in

most countries, governments allocated their rights (patents, copyrights, trademarks etc.) to the recipient research institutions to a significant degree. As a result, the diffusion of climate-friendly technology would “typically be along a pathway of licensing or royalty payments rather than use without restriction in the public domain.” (Sathaye et al., 2005). The Intergovernmental Panel on Climate Change (IPCC) study (2000) calls on OECD countries to influence the flow of such technology directly through their influence on the private sector or public institutes that receive funding from government for their R & D to be more active in transferring technologies to developing countries. It cites Agenda 21 (chapter 34, paragraph 34.18a) that “governments and international organisations should promote the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain.” Products that emerge from publicly funded R & D should be placed in the public domain. Those that are partially funded should be in the public domain to the extent to which it is publicly funded.

At the international level, there can also be public funding and joint planning of R & D programmes. Products and technologies emerging from such publicly funded programmes should be placed in the public domain.

For technologies that are patented, there should be an understanding that patents should not be an obstacle for developing countries to have access to them at affordable prices. Agenda 21 (para. 34.10) states that: “Consideration must be given to the role of patent protection and intellectual property rights along with an examination of their impact on the access to and transfer of environmentally sound technology, in particular to developing countries, as well as to further exploring efficiently the concept of assured access for developing countries to environmentally sound technology in its relation to proprietary rights with a view to developing effective responses to the needs of developing countries in this area.” Agenda 21 (para. 34.18e) also agreed that in the case of privately owned technologies, measures would be adopted particularly for developing countries, including developed countries creating incentives to their companies to transfer technology; purchase of patents and licenses for their transfer to developing countries; prevention of the abuse of IPRs including through compulsory licensing with compensation; providing funds for technology transfer; and developing mechanisms for technology access and transfer.

There are some examples of developing countries and their firms being hampered from adopting climate-friendly technologies or products due to there being patents on these products, and due to the unreasonable demands made by the patent holders on companies in developing countries that requested a voluntary license from the patent holder. A study on transfer of technologies for substitutes for ozone-damaging chemicals under the Montreal Protocol has given details for some cases in which technology transfer to developing countries’ firms was hindered by either high prices or other unacceptable conditions imposed by companies holding patents on the chemical substitutes onto companies in developing countries that wanted a license to manufacture the substitutes. Examples include: (a) The case of HFC-134a, a chemical used to replace harmful chlorofluorocarbon (CFC) in refrigeration. When Indian companies requested a license from a US company owning the patent for HFC-134a, in order to manufacture the chemical, they were asked to pay a high sum which was far above the normal level, or to allow the US company to own a majority equity

stake in a joint venture and with export restrictions on the chemical produced in India; both options were unacceptable to the Indian producers; (b) Korean firms also faced difficulties when they wanted to replace CFCs with acceptable substitutes HFC-134a and HCFC-141b, which had been patented by foreign companies in Korea. “South Korean firms are of the opinion that the concession fees demanded by technology owners represent a lack of intention to transfer the alternative technology.” (Anderson et al., 2007, pages 262-265); (c) The case of HFC-227ea: This chemical (known also as FM-200) is a substitute for halon-1301 for fire protection applications. The US owner of the FM-200 patent required that licensed fire protection systems satisfy certain design and inspection requirements and only 3 enterprises (in the US, UK, and Australia) have satisfied the approvals. The patent owner offered joint ventures with majority share holding but did not want to license the technology to wholly locally owned firms, and thus Indian firms are unable to avail themselves to this product (Anderson, 2007, page 265); (d) Many of the technology agreements between Korean firms and their partners in Japan and the US contain restrictions such as they are not allowed to consign to a third party, to export, and that the improved technologies should be shared (Anderson, 2007).

According to the rules of the WTO’s Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement, if there is a patent on a product or technology, firms can request for a voluntary license from the patent holder to allow the manufacture or import of generic versions of the patented product or technology. The patent holder will normally charge a royalty or license fee for granting the license. If the patent holder refuses to give a license, or imposes unreasonable conditions, or if the price charged is too high, the firm can apply to the government to grant it a “compulsory license”. Alternatively, a government that wants to have access to generic versions of a product or technology can itself take the initiative to issue a compulsory license.

Under the TRIPS Agreement, there is considerable flexibility provided to WTO Member States on grounds for issuing compulsory licenses. These grounds are not restricted, as confirmed by the WTO Ministerial Declaration on TRIPS and Public Health (WTO, 2001b). In developed countries, there have been many compulsory licenses granted by the government to facilitate cheaper products and technology in the industrial sector. In many developing countries, compulsory licenses have been issued for the import or local production of generic drugs. Thus, compulsory licensing is an option particularly when the patent-holder is unwilling to provide a voluntary license with reasonable conditions.

Some developing countries have previously proposed at the WTO that countries be allowed not to patent environmentally-sound technology so that its transfer and use can be facilitated. The relaxation of the TRIPS rules in the case of climate-related technologies has also been proposed by developing countries in the UNFCCC; however this was opposed by major developed countries. Governments can also facilitate easier access to voluntary licenses. Measures can also be taken to ensure that royalty and other conditions in voluntary licenses are fair and reasonable.

International cooperation is also needed to establish programmes that support developing countries to assess their technological needs in different sectors; to assess the appropriateness of various technologies, taking account of the environmental,

safety, social and economic aspects; to identify the obstacles to the development or transfer of these technologies; and to devise policies and measures to overcome the obstacles. A network of technology experts in various areas should be made available to advise developing countries. Technology funds should be established, including under relevant conventions such as the UNFCCC and CBD, as well as in the social and development areas, to finance technology development and transfer.

Agenda 21 also has many useful proposals and decisions, including establishment of a collaborative network of research centres, support for cooperation and assistance programmes, and building capacity for technology assessment, and collaborative arrangements. These should be revisited as part of the Rio Plus 20 process.

As discussed earlier, the development and deployment of environmentally-sound technologies requires a strong and dedicated programme at the national level, with significant public investments in developing countries, for projects such as feed-in tariffs to enable large-scale development and use of renewable energy. Due to the limited resources of developing countries, a significant part of the financing for such technology programmes should be from international funds.

V. FINANCING FOR SUSTAINABLE DEVELOPMENT

The Rio Summit and its Agenda 21 gave a justifiably critical place to financing as one of the two key means of implementation (the other being technology transfer) of sustainable development objectives. The 1989 United Nations General Assembly resolution mandating the Summit stated that UNCED should identify ways and means to provide new and additional financial resources for environmentally sound programmes and ways to effectively monitor the provision of such new and additional resources; and should consider various funding mechanisms including a special international fund for technology transfer to developing countries.

The rationale for international financing was agreed to and clarified in Agenda 21. Economic growth, social development and poverty eradication are the first and overriding priorities in developing countries and are themselves essential to meeting sustainability objectives. In light of the global benefits of implementing Agenda 21, providing finance and technology to developing countries will serve the common interests of developed and developing countries and humankind in general, including future generations. Without these means of implementation, it will be difficult for developing countries to fully implement their commitments. The cost of inaction could outweigh the financial costs of implementing Agenda 21 and inaction will narrow the choices of future generations. (UNCED, para. 33.3)

In addition to the developing countries' development priority, their lack of financial resources and the global benefits of action, it has been argued that developed countries have historically been responsible for most of the pollution and emissions as well as depletion of resources, that there is now very limited "environmental space" left for developing countries, and that developed countries presently have greater financial and technological resources.

The UNCED Secretariat estimated the additional financing cost of the activities in each sector as elaborated in the Agenda 21 Chapters. In total, the estimated average annual costs (in 1993-2000) of implementation in developing countries were over \$600 billion, and of this total the Secretariat estimated that \$125 billion would be from international cooperation in grant and concessional terms. (UNCED, para. 33.18)

The outcome, as reflected in Agenda 21, was that developed countries make financial commitments to give effect to the UNCED decisions, with developing countries drawing up national sustainable development plans, and a regular review and monitoring be conducted on the adequacy of funding and mechanisms, including efforts to reach the targets. (UNCED, para. 33.21)

UNCED agreed that substantial new and additional funding for sustainable development and implementing of Agenda 21 will be required. The key outcome was that developed countries reaffirmed their commitments to reach the United Nations (UN) target of 0.7 per cent of Gross National Product (GNP) for ODA as soon as possible, with some agreeing to a 2000 deadline. Those countries that have already reached the target were commended and urged to make additional contributions,

while other developed countries agreed to make their best efforts to increase their ODA level. (UNCED, para 33.13)

The finance issue also figures prominently in other related processes. Under the Climate Convention (UNFCCC), developed countries committed to provide financial resources, including for technology transfer, needed by developing countries to meet the agreed full incremental costs of their mitigation measures (article 4.3) and to also meet the costs of adaptation (article 4.4). The extent to which developing countries will implement their commitments will depend on the effective implementation by developed countries of their finance and technology transfer commitments, and will take fully into account that economic and social development and poverty eradication are the developing countries' first and overriding priorities (article 4.7).

Under the biodiversity convention (CBD), developed countries committed to provide new and additional financial resources to enable developing countries to meet the agreed full incremental costs to them of implementing measures to fulfill their CBD obligations. The implementation of the finance commitments shall take into account the need for adequacy, predictability and timely flow of funds and the importance of burden-sharing among the contributing Parties (article 20.2). The extent to which developing countries will implement their CBD commitments will depend on the effective implementation by developed countries of their finance and technology transfer commitments and will take fully into account the fact that economic and social development and eradication of poverty are the first and overriding priorities of the developing countries (article 20.4).

The monitoring and implementation aspects of the finance obligations have been weak. The 1989 proposal in the UN General Assembly resolution mandating UNCED to consider a technology fund did not materialise. Most developed countries have not yet reached the 0.7 per cent ODA target and funding for sustainable development activities remains far from adequate.

In recent years, negotiations at the UNFCCC have seen movement on the issue of financial resources for climate change. Decisions at the meeting of the Conference of the Parties in Cancun in December 2010 included noting the developed countries' commitment to provide new and additional resources approaching \$30 billion in 2010-2012, and recognised that developed countries commit to a goal of mobilising \$100 billion a year by 2020 to address the needs of developing countries. A decision was taken to establish a Green Climate Fund under the UNFCCC; the Fund will be designed in 2011 by a transitional committee.

At the Nagoya meeting of the CBD Conference of Parties in November 2010, a Strategic Plan (2011-2020) was adopted. Many finance-related issues remain to be resolved, including the size of resources needed not only for climate-related activities but also those in other areas such as addressing biodiversity, toxic substances and wastes, water and energy, as well as social sectors (Chee, 2010).

The scale of financing required by developing countries for climate mitigation and adaptation activities has been estimated at several hundreds of billions of dollars a year, or even a trillion dollars and more. In a review of various estimates of mitigation costs, UNDESA (2009, pp. 154-155) found the range of over \$400 to

\$1,200 billion annual additional cost of mitigation strategies for the world and over \$200 billion to almost \$1,000 billion for developing countries, for a scenario of limiting Greenhouse Gas concentration to 450 ppm. The World Bank (2010b) estimated in developing countries mitigation would cost \$140-175 billion a year over the next 20 years, with associated financing needs of \$265-565 billion, with a 450ppm scenario. For adaptation, a World Bank adaptation report estimates the annual cost between 2010 and 2050 of \$75-100 billion a year. A more comprehensive study by scientists led by Parry (2009) that includes the adaptation costs in more areas has far higher estimates (\$400-600 billion).⁹ Given these estimates, the volume of funds mentioned for mobilization (\$100 billion annually by 2020) is far from adequate, especially when taking into account the finance-related commitments of developed countries in the Climate Convention, including payment for the agreed full incremental costs of mitigation measures.

There are also other costs required to be met besides those for climate change. At the CBD Conference of the Parties' meeting in Nagoya (2010), there was no agreement to establish specific targets for financial resources mobilisation, although the G77 and China proposed specific figures with time lines. It was agreed to develop and apply methodologies for assessing gaps and needs, as well as progress in the increase in and mobilisation of resources against several indicators that were adopted (including aggregated financial flows of biodiversity-related funding and flows from various sources to developing countries) (Chee, 2010).

With the big gaps still between what is required and what has been committed, major efforts are needed to mobilise and channel the sufficient financial resources towards sustainable development activities. There have been intense recent discussions among public interest groups, and delegations in Conventions and other fora on the amounts of funds, the sources and uses, and the structures of funds.

The UNDESA report on climate and development (2009, pp. 151-183) reviews methods to "crowd in" private sector financing (through cap and trade, carbon taxes, sources of green investment and consumer financing; and proposals for public sector international cooperation financing (including mandatory assessed contributions by developed countries into a fund); revenue from global auctioning of emission permits; a global carbon levy; and revenues from carbon offsetting schemes.

The November 2010 report of the UN Secretary General's high-level advisory group on climate change financing concluded it is challenging but feasible to mobilise \$100 billion a year by 2020 to address the needs of developing countries. The sources analysed by the group and the annual amounts that can be raised include auctioning of allowances in domestic emissions trading schemes (\$2 to 70 billion); global offset levies (\$1-15 billion); revenues from taxes on international aviation (\$1-6 billion); taxes on maritime emissions (\$2-19 billion), carbon tax (\$10 billion), removal of fossil subsidies (\$3-8 billion), redirection of fossil royalties (\$10 billion), financial transactions tax (\$2-27 billion), direct budget contributions (reference was made to the proposal of assessed contributions of 0.5 to 1 per cent of GNP, which is \$200-400 billion), net flows of development banks (\$11 billion), net carbon market offset flows

⁹ For details of these cost estimates for climate mitigation and adaptation, see Khor (2010b).

(\$8-14 billion). Obviously this is only a listing of sources that have been examined, with amounts based on certain assumptions, and not a proposal by or accepted by governments.

An important issue not in the above list is the use of Special Drawing Rights (SDRs) for purposes of supporting developing countries for sustainable development activities. The G20 in its London Summit (2009) agreed that the International Monetary Fund (IMF) would issue \$250 billion of SDRs as a means of increasing liquidity to counter recessionary trends arising from the global financial crisis, and this was subsequently implemented at the IMF. As the issuance was to countries in accordance with the IMF quotas, developing countries obtained only a small share of the allocation. The G77 and China proposed that there be periodic issuance of SDRs to provide resources to developing countries in need of liquidity due to the financial crisis. Subsequently several countries, individuals and organisations have proposed the use of SDR issuance for various uses, including to fund climate change actions in developing countries. This should be considered further, especially in a period when government budgets in developed countries are coming under stress, affecting the ability or will to increase budgetary support to developing countries.

Developing countries in various fora, have insisted on the principle of “adequate, new and additional” international financial resources for environment activities, especially those with global benefits, or those activities that have to be undertaken although the environmental problem is mainly caused by factors external to the country, like adaptation to climate change. It is important that estimation be continuously made and updated on the scale of funding that is required by developing countries for sustainable development activities, and that a proper system be established for the reporting of developed countries' implementation of committing “new and additional financial resources”. The funds should not be from existing resources earmarked for other activities, such as health-care or education, for this would deprive other worthy sectors of their funds. This is because development should not have to make way for the environment. The criteria for “new and additional” should be clarified and a system be set up for monitoring the flow of resources, to be measured against what is required and what has been pledged. The decision in the UNFCCC for the transfer of finance and technology to be subject to being “measurable, reportable and verifiable” should be followed up by establishing such a system of continuous monitoring, measurement, reporting and verification. This should be done in other areas of the environment, as well as development.

Developing countries also stress the importance of the predictability of funding, whose flows and volumes should not have to be dependent on variable or volatile factors. The funds should not be attached to unrelated and unnecessary conditionalities, nor tied to cumbersome and expensive bureaucracy which delays the disbursement, or go through agencies, which adds to the costs and bureaucracy that detracts from the amounts received from recipient countries. In the financial flows, and especially if there are new multilateral funds, the governance should be democratic, with developing countries having an equitable share in the decision-making bodies. There should be adequate safeguards and technical capacity to ensure the accountability and proper use of funds.

Developing countries generally also prefer funds sourced through the public sector, in a predictable manner, and that is non-debt creating. This is to avoid new indebtedness arising from environment or social sector activities, as it is difficult for such activities to earn net revenues that enable sustainable debt servicing. For example, in discussions on climate change, it is widely recognised that adaptation activities in general should be funded by grant-type payments rather than loans, as there is little or no commercial gain possible from most adaptation activities. There are concerns that if these non-commercial activities are financed through loans, they may add on to the countries debt burden and contribute to loan-related difficulties. Regarding financing through the carbon markets, several developing countries and many civil society groups have several concerns, including that this facilitates offsets that enable developed countries to pay for pollution rights and escape from having to reduce their own emissions; that the system is open to fraudulent activities; the creation of financial markets for carbon leads to new opportunities and manifestations of financial speculation in which the carbon price reflects the state of speculation and in which there is unpredictability and volatility not only in the price but the activities being funded; and concerns about the unethical and social implications of the “commodification of nature.”

The developing countries have often proposed in fora that discuss or negotiate on environmental and social issues that funding should mostly be from public sources, and in non-loan form, in which budgetary allocations could be supplemented by innovative taxes such as a financial transactions tax and a levy on airline tickets. If the financing is for activities that are commercial in nature, the non-loan component may be mixed with loans on a concessional basis, which could possibly leverage market loans.

The issue of financing sustainable development and the transition to a green economy is not restricted to ODA or the transfer of funds through various Conventions. It is also linked to other issues in the global economy which greatly influence the amount and volatility of the flow of financial resources to developing countries. These issues include external debt, the terms of trade, trade policies and performance, commodity prices, volatility in the international flows of funds, and reform of the international monetary and financial system. Many of these issues were dealt with in the 1992 Rio process, and are included in Agenda 21, because of the understanding that they are an integral part of the sustainable development framework. These issues also form Goal 8, a global partnership for development, of the Millennium Development Goals. Thus, issues in the global economic, trade and finance systems are an important and integral part of the sustainable development framework, and should similarly be an essential part of discussions on the green economy. In particular, greater financial resources can be made available to developing countries through better terms of trade, development-oriented trade policies, corrections to the imbalances in the multilateral trading system, debt relief to developing countries facing debt-related difficulties, a more development-oriented intellectual property system, and appropriate reforms to the international financial and monetary system.

VI. CONCLUSION

There are many challenges and obstacles facing developing countries in moving their economies to more environmentally friendly paths. On one hand this should not prevent the attempt to urgently incorporate environmental elements into economic development. On the other hand, the various obstacles should be identified and recognised and international cooperation measures should be taken to enable and support the sustainable development efforts. The conditions must be established that make it possible for countries, especially developing countries, to move towards a “green economy.” The main conditions and dimensions have been recognised in the negotiations that led to Rio 1992, and are well established in the Rio Principles and in Agenda 21. The treatment of the “green economy” in Rio Plus 20 should be consistent with the sustainable development concept, principles and framework, and care should be taken that it does not detract or distract from “sustainable development”. Thus the “value added” to the Green Economy as contrasted to sustainable development should be identified. Care has to be taken to ensure that the “green economy” term and concept is also understood to include the social, equity and development dimensions, including the need for international provision of finance and technology and accompanying global economic reforms and that the risks of the misuse of the term are adequately addressed.

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**Chemin du Champ d'Anier 17
PO Box 228, 1211 Geneva 19
Switzerland**

**Telephone : (41 22) 791 8050
Fax : (41 22) 798 8531
Email : south@southcentre.org**

**Website :
<http://www.southcentre.org>**

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