



## **Building Resource Efficient Economies and Sustainable Societies**

### **The Marrakech Process on Sustainable Consumption and Production and the International Panel for Sustainable Resource Management**

#### **A contribution for the Ministerial Consultations and Special Event at UNEP's 25<sup>th</sup> Governing Council<sup>1</sup>**

##### ***Introduction***

It has often been remarked upon that moments of crisis are also moments of opportunity. In this spirit, the United Nations Environment Programme (UNEP) has created a Green Economy Initiative and is advocating that the international community adopt an ambitious Global Green New Deal as part of its strategy for responding to the ongoing global economic crisis. These initiatives come in response not only to today's worrisome economic conditions, but also to the threat of climate change and to the energy, food, and water crises that became increasingly evident over the past year. (For further information, see Background paper for the Ministerial-level Consultations, Discussion paper presented by the Executive Director, *Globalization and the Environment, Global Crises: National Chaos?*).

UNEP is also centrally involved in two other ongoing international initiatives that could make important contributions to delivering on the Global Green New Deal and supporting efforts by countries to transition to green economies—the Marrakech Process on Sustainable Consumption and Production and the International Panel for Sustainable Resource Management.

The **Marrakech Process** is a global multi-stakeholder process to promote implementation of sustainable consumption and production (SCP) and to develop an international framework to support regional and national initiatives on SCP—called the 10-Year Framework of Programmes (10YFP). The process responds to the call of the Johannesburg Plan of Implementation adopted at the 2002 World Summit on Sustainable Development to develop a 10YFP to promote the shift towards sustainable patterns of consumption and production. The U.N. Commission on Sustainable Development (CSD) will review the theme of SCP and the 10YFP during its 2010/11 two-year cycle. UNEP and the U.N. Department for Economic and Social Affairs (UNDESA) are the leading agencies for this process, with the active participation of governments and development agencies, representatives from private sector, civil society, academia; and other stakeholders.

The **International Panel on Sustainable Resource Management (the “Resource Panel”)** aims to contribute to improved knowledge on ways and means of achieve a decoupling between economic growth and environmental degradation. The panel's focus is on resource efficiency and resource productivity, rooted in life cycle thinking and the notion of a circular economy. It is composed of 18 eminent independent scientists (chaired by Ernst Ulrich von Weizsaecker of Germany and Ismail Serageldin of Egypt) and is governed by a Steering Committee consisting of national governments, civil society and other stakeholders. The Resource Panel was formally launched in November 2007.

This background paper explores the contributions that the Marrakech Process and the Resource Panel can make to efforts to address the energy, food, and water crises and in broader terms to constructing more resource efficient economies and sustainable societies. The paper also sets out some potential synergies between the work of the Marrakech Process and the Resource Panel and UNEP's Green Economy Initiative.

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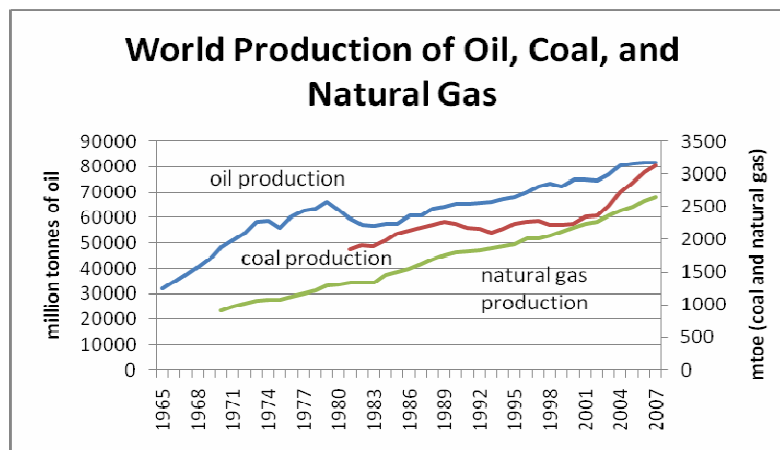
<sup>1</sup> This paper has been prepared with the support of the Worldwatch Institute to stimulate discussion at the Special Event on “Building Resource Efficient Economies and Sustainable Societies”. The views expressed in the paper do not necessarily reflect those of the UNEP Secretariat.

### *Three Interlinked Crises: Energy, Food, Water*

Key building blocks of human civilization—energy, land, and water—are under increasing pressure as global population surges and prosperity advances across the globe. Global population is currently projected to increase by some 42 percent between 2008 and 2050, from 6.7 to 9.5 billion people.<sup>2</sup> Such numbers would drive per person availability of some resources such as arable land and water below critical thresholds in many countries.<sup>3</sup> Meanwhile, economic expansion multiplies the resource impact of population growth, and resource intensive consumption patterns so far primarily associated with developed countries are now spreading to some emerging economies. In 2007, some 45 national economies expanded by 7 percent or more, according to the International Monetary Fund, a rate that will double the size of these economies in just ten years.<sup>4</sup> These trends point to the importance of decoupling economic growth from resource use and environmental degradation—a main focus of the work of the Resource Panel as well as of the Marrakech Process on SCP.

Regarding **energy**, the fossil fuel-based energy system that built modern industrial economies may be in the early stages of displacement as concerns about supply mount and as climate and other environmental damages become acute. In the face of a diminishing resource base, the spread of industrialization and the expansion of the consumer class in many countries has driven up demand—and prices—over most of the past eight years. High prices, once the result of supplier-created scarcities in the 1970s and 1980s, were until the current recession the product of rapidly expanding demand and slow-growing supplies. Production of oil, coal, and natural gas has risen steadily this decade (see Figure 1), fueled increasingly by demand in emerging economies: the share of global oil consumption from non-OECD nations increased from 37 percent in 1997 to almost 43 percent in 2007. The recession has eased that pressure, probably temporarily.

Figure 1



SOURCE: BP, *Statistical Review of World Energy 2008*.

In addition to concerns about supply and prices, fossil fuel dependence also generate a range of environmental, economic, and health impacts, from air pollution and diminished crop output to respiratory disease and climate change. One of the greatest challenge surrounding fossil fuel resources today is the carbon dioxide they emit when combusted, which is changing global climate patterns. Indeed, the climate liability of oil and coal may cause use of these fuels to be curtailed before reserves are in danger of disappearing. And the environmental,

<sup>2</sup>U.S. Census Bureau projections, available at <http://www.census.gov/ipc/www/idb/worldpop.html>.

<sup>3</sup>Population Action International, *People in the Balance: Population and Natural Resources at the Turn of the Millennium* (Washington, D.C.: 2000).

<sup>4</sup>This section draws from a preliminary draft of *The Rationale for Sustainable Resource Management*, a report to the Government of Netherlands from the Worldwatch Institute, Forthcoming 2009.

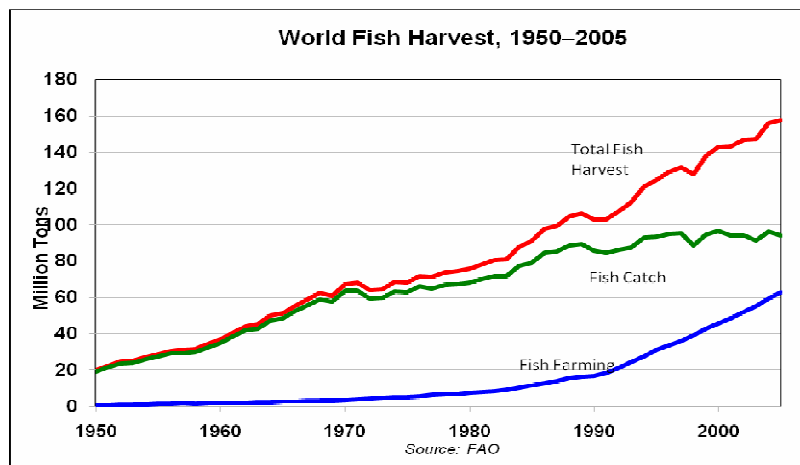
economic and health impacts of fossil fuel use may become more acute as supplies of fossil fuels decline and lower quality resources are used.

As with energy, much of the attention given to the **food** crisis over the past years has been focused on the social impact of rapidly rising prices, particularly for those who can least afford to pay them. For example, the World Bank estimates that rising food prices in recent years have pushed 130-150 million people around the world into extreme poverty. Global food prices rose by 83% in the three years up to April 2008. Although food prices have since declined somewhat, analysts expect them to stay at high levels over the medium to long term as a result of a number of underlying threats, climate change and water scarcity among them.<sup>5</sup>

The U.N. Food and Agriculture Organisation (FAO) estimates that some 963 million people, about one out of every seven humans, are chronically hungry, and the number is rising. Meanwhile, food requirements are projected to increase by 70–80 percent in the next 50 years. Farmers are under pressure to deliver more output per hectare as a result. Yet some 40 percent of the world's agricultural land was identified as seriously degraded in a 2000 study carried out by the International Food Policy Research Institute, including 75 percent of cropland in Central America, 20 percent in Africa, and 11 percent in Asia. Degradation may already be affecting productivity on some 16 percent of agricultural area worldwide.

Fisheries, another major source of food and the primary source of protein for much of the world's poor, are also under pressure. Global oceanic fish catch increased steadily from 1950 to the mid-1980s, then leveled off as overfishing caused important fisheries to collapse (see Figure 2). Three quarters of marine fish stocks monitored by the FAO were fished at or beyond capacity in 2006. Yet more people are demanding more fish—fish consumption per person has tripled since 1950. As a consequence, today some 40 percent of the world's fish harvest is farmed fish, up from 5 percent in 1950. But aquaculture often generates pollution and disease, and many aquaculture operations can require more feed than the farmed fish yield.

Figure 2



In addition to the ongoing energy and food crises, it is becoming increasingly clear that the world community also faces major challenges with **water scarcity** in the years ahead. Water is a unique resource: vital for humans and all other life, it has no substitute for most uses. But water is being overused, often by overpumping groundwater. More than 1 billion people live in regions that “generate no appreciable supply of renewable fresh water,” according to the Millennium Ecosystem Assessment, and some 2.4 billion people—more than one third

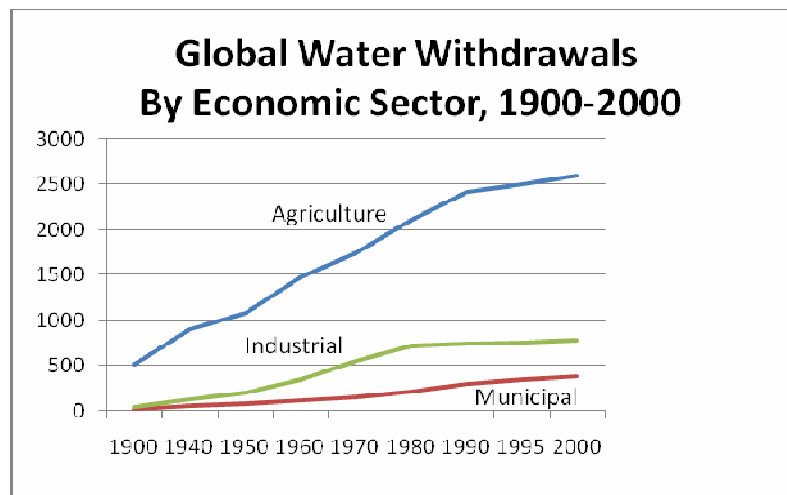
<sup>5</sup> *Rising Food Prices: Drivers and Implications for Development*. Chatham House Briefing Paper, April 2008

of the world population—now live in water-stressed regions.<sup>6</sup> Water scarcity globally, measured as water use relative to accessible supply—has increased nearly 20 percent per decade globally since 1960.<sup>7</sup>

Population growth alone will push many countries into the ranks of the water-stressed in the next two decades, where it is difficult to meet water demand from all sectors. But it is by no means the only variable affecting resource demand and availability. Climate change is another important factor. Changes in patterns of rainfall, snowfall, evaporation, and plant demand for water are projected to have a strong impact on water availability in coming years and decades in some regions. The Intergovernmental Panel on Climate Change estimated in 2008 that by the 2050s, the area of land experiencing increased water stress due to climate change will be more than twice as great as the area where water stress declines. Even areas where water supply increases will see this advantage more than offset by greater variability in rainfall, seasonal runoff, and water quality, and greater risk of flooding.<sup>8</sup>

The energy, food and water crises described above are interlinked in many ways. For example, rising energy costs were a major contributor to increasing food prices in 2008, and energy and food concerns have converged over the issue of biofuels. Concerns about rising water scarcity, meanwhile, are inextricably linked with agricultural issues, as more than 70 percent of the world’s water supplies are used in agriculture, mainly for irrigation (see Figure 3). And all of these crises are closely linked with climate change. Given the close relationship between the energy, food, water and climate crises, it is important that the international community respond to them in an integrated manner. The Resource Panel and the Marrakech Process both provide useful vehicles for doing exactly that. Increasing interactions between officials, experts and institutions engaged in these two processes and those engaged in the Green Economy Initiative, should generate new ideas and public and private initiatives to address the three crises and build a more sustainable global economy.

Figure 3.



SOURCE: Shiklomanov/UNESCO

<sup>6</sup> Taikan Oki and Shinjiro Kanae, “Global Hydrological Cycles and World Water Resources,” *Science*, Vol. 313, 25 August 2006.

<sup>7</sup> Millennium Ecosystem Assessment, *Ecosystems and Human Well Being: Current State and Trends*, Chapter 7 Fresh Water, p. 167.

<sup>8</sup> B.C. Bates, Z.W. Kundzewicz, S. Wu and J.P. Palutikof, eds., *Climate Change and Water: IPCC Technical Paper VI*, (Geneva: Intergovernmental Panel on Climate Change Secretariat, 2008) p. 3.

### *The Role of the International Panel for Sustainable Resource Management*

Addressing the mounting food, energy, and water crises poses substantial challenges. These global crises are not short term issues and will require the sustained attention of governments, donors, international and regional organizations as well as of civil society and private sector for years and decades to come. Key problems resulting from current and predicted trends in resource use include environmental degradation, resource scarcity and supply security. Resource depletion and associated environmental degradation are increasingly constraining the development prospects of developing countries and poor communities within them.

These environmental and economic problems are becoming more and more interconnected as resources, products, wastes and environmental impacts move across borders in an increasingly globalised economy. International and cross-cutting solutions are needed, as well as a general consensus about the goals and roadmaps for the way forward. Indeed, how could governments mitigate, or adapt to, these crises, if available options are not clearly identified? However, such consensus does not yet exist, as the nature and scale of the problems and solutions are difficult to estimate. Despite the growing body of scientific information and analyses about these crises, the overall situation is still disputed. Furthermore, the technical nature of the debates remains an impediment to the integration of scientific findings into the effective management of these crises. Undoubtedly, a solid understanding and consensus on sustainable food, energy and water management is needed for policy makers to mitigate risks and adapt to ongoing crises.

Benefiting from the broad support of governments and scientific communities, the Panel is composed of eminent scientific experts in the field of resource management. It aims to provide decision makers and other interested parties with independent and authoritative information about solutions to mitigate or adjust to crises resulting from resource mismanagement. Convened by UNEP, the Panel's role is to provide policy relevant assessments that crystallize and evaluate the latest scientific, technical and socio-economic literature on global resource use for immediate and action-oriented decisions.

The Resource Panel has started working on two sectoral priorities (biofuels and global metal flows) and on two cross-cutting themes (decoupling and prioritization), all of which link in various ways with the energy, food, and water crises. Working groups on these topics have been formed within the Resource Panel, and they will produce first assessment reports in 2009. Given the urgency of the water crisis, the Panel is also considering creating a working group on water efficiency

The Working Group on Decoupling is assessing the scientific understanding of decoupling, resource productivity and related methodologies and indicators. This analytical work is critical to helping governments identify the policies that effectively decouple economic growth and environmental degradation, reducing long term risks due to poor resource management. The objective of the Working Group is also to review the relationships between resource consumption and its related impacts in regions where food, water and energy are lacking, and to analyze the ways these relationships can be offset.

Furthermore, one of the key questions that a policy maker dealing with the economic and environmental crises has to answer is—where to start? A fuller understanding of the resource requirements and pollution generated by different economic activities is required so that we can systematically adjust our activities to the limited availability of resources and the pollution absorption capacity of the earth. Prioritizing action to address products, activities and materials that result in the largest environmental impacts and contribute most to resource scarcity would serve to direct environmental and resource policy to those areas that really matter. Thus, the Resource Panel set up a Working Group on the Prioritisation of Products and Resources from an Environmental Point of View ('Prioritisation'). The aim of the Working Group is to review existing prioritization studies and other work relevant to prioritization and to come up with a clear framework for risks prioritization, applicable to water, energy, food and any other resource management challenges.

Biofuels are at the core of the nexus between climate-energy-food as they have the potential to help address energy security and climate change, but at the same time may result in pressure on increasingly scarce land and

natural resources. It is therefore crucial to engage in careful planning of biofuels development, based on solid assessment of benefits and risks, including potential indirect impacts. The overall objective of the Biofuel Working Group is therefore to improve the analytical basis for decision making towards sustainable production and use of biomass for energy purposes ("biofuels"), at the international, regional and national levels. Based on a review of existing studies, the Group examines different aspects and options for more efficient and sustainable use of biomass in the overall resource context. The Group takes into account the differences between production chains and the comparative performance of most relevant biofuel types and their mineral substitutes (micro perspective), as well as the overall outcome of production and use considering actual and foreseeable trends (macro perspective).

In the same vein, metals are resources whose environmental impact is large (especially during their extraction), and whose management is important to mitigate energy and climate crises. Recycling metals results in large energy savings compared with virgin production: in the case of aluminum the energy savings are estimated to be as high as 95 percent. Recycling metals also reduces air and water pollution as well as water use.<sup>9</sup> The Working Group on Global Metal Flows aims to analyze the reuse and recycling of metals by providing scientific and authoritative assessment studies on the global flows of metals. The group cooperates with a number of knowledgeable and influential actors, including metal industry associations. It will summarize its findings in a series of descriptive policy reports on global metals flows and recycling.

Over the longer term, the Resource Panel will play a key role in linking the efforts of the business and scientific communities with policy makers. Fostering these links is critical for better articulating the decision making process and improving policy responses in the context of resource crises. The *business community*, with its first hand knowledge of large scale resource consumption and the benefits of resource efficiency, is looking to the panel for well synthesized and reliable knowledge on resource management. The *academic and research communities and non-governmental organizations (NGOs)*, who have led the way in providing a forewarning that humanity is facing severe resource constraints and key knowledge such as life cycle databases and material accounting, are looking for an independent platform to link their activities with those of decision makers.

At the international level, the creation of the Panel responds to the need of a number of governments and international organizations, which look for reliable sources of information on resource management and risk mitigation. Sustainable resource management has become an essential issue for policy makers in both developing and developed countries.

There is indeed a broader understanding of the linkages between resource mismanagement and the food, energy and water crises. The European Commission launched its Thematic Strategy on the Sustainable Use of Natural Resources in 2005, aimed at reducing the environmental impacts associated with resource use. In Asia, Japan's 3R Initiative (**R**educe, **R**euse, **R**ecycle) and China's Circular Economy are promoting alternative national policies to move towards a "sound material-cycle economy". UNEP, the G8 and the OECD have developed programmes related to resource efficiency or resource productivity. In 2008, the G8 Environment Ministers recognised the Resource Panel as a leading international initiative on sustainable resource management that analyses the environmental and economic impacts of materials flows<sup>10</sup>. The Panel provides added value to these initiatives by creating the sense of urgency and strengthening the scientific knowledge base needed for informed decision-making.

The Panel aims to contribute to a strong and coherent approach both by the UN system and between the UN system and the broader international community to mitigate resource-related crises. The panel's findings will thus feed the activities of the Marrakech Process and contribute to the development of the 10YFP. In return, the large variety of activities associated with the 10YFP will increase the scientific knowledge on sustainable resource management and provide valuable information to the Panel.

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<sup>9</sup> Recycling benefits from <http://www.recyclemetals.org/whatis.php>.

<sup>10</sup> G8 Environment Ministers Meeting 2008, *Kobe 3R Action Plan*.

***The Role of the Marrakech Process and the 10 Year Framework of Programmes on Sustainable Consumption and Production (10YFP)***

As governments and other actors consider how to manage energy, food, and water crises and build a Green Economy, they also have at their disposal the Marrakech Process on Sustainable Consumption and Production.

The Marrakech Process was established as a global multi-stakeholder platform to support the implementation of SCP and to develop a 10 Year Framework of Programmes to support the regional and national initiatives on SCP—called the “10YFP”. The CSD will review the theme of SCP and the 10YFP during its 2010/11 two-year cycle. The Marrakech Process includes activities such as international and regional expert meetings, task forces, and dialogues and forums with development cooperation agencies and with business and industry and NGOs. In its first five years, the Marrakech Process has developed regional SCP programmes or action plans in Africa, Europe and Latin America with the institutional support of the regional intergovernmental organizations.<sup>11</sup> These programmes or action plans address issues that are highly relevant to the energy, food, water, and climate crises. The West Asian, Asia-Pacific and North American regions have also engaged in similar processes in 2008.

Seven Marrakech Task Forces have been created that support the development of SCP tools, capacity building and the implementation of SCP projects on the following specific SCP-related issues: cooperation with Africa, sustainable products, sustainable lifestyles, sustainable public procurement, sustainable tourism, sustainable buildings and construction, and education for sustainable development. All of these topics relate closely to efforts to forge a Green Economy and to respond to problems such as climate change and resource scarcity. Most of the task forces are supporting the implementation of demonstration projects and the collection of best practices. These include creating a Tool Kit on Sustainable Public Procurement, implementing a project on Eco-labelling for Africa, undertaking an awareness-raising campaign for tourists called the Green Passport, conducting a Global Survey on Sustainable Lifestyles, developing guidelines for education on sustainable consumption, and preparing a study on the contribution of sustainable buildings and construction to climate change mitigation<sup>12</sup>

Activities have also taken place at the national level supporting the development of National SCP Programmes through capacity building and implementation of demonstration projects in various countries, including Mauritius, Senegal, Indonesia, Tanzania, Egypt, Mozambique, Colombia, Brazil and Ecuador. Progress has been made in engaging countries with emerging economies, including the convening of national roundtables on SCP in China, India, Brazil and South Africa.<sup>13</sup>

The 10YFP being constructed by the Marrakech Process will be an international framework for action that regions, countries and the range of stakeholders within them can implement to accelerate the shift towards SCP, promoting social and economic development within the carrying capacity of ecosystems. Some of the main objectives of the 10YFP have been outlined in the Johannesburg Plan of Implementation: mainstreaming the sustainable use and management of natural resources in the decision making process of governments, private sector and civil society organizations; scaling and speeding up progress towards meeting the relevant MDGs, raising living standards in developing countries in a sustainable manner; decoupling economic growth from environmental degradation; and stimulating demand for and supply of sustainable products and services in the market.

A proposal for the 10YFP will be presented to the U.N. Commission on Sustainable Development in 2010-2011. The Secretariat of the Marrakech Process (UNEP and UNDESA) is elaborating a draft proposal for a 10YFP

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<sup>11</sup> For more information on the regional process and outcomes see:

<http://www.unep.fr/scp/marrakech/consultations/regional>

<sup>12</sup> For more information please refer to: <http://www.unep.fr/scp/marrakech/taskforces>

<sup>13</sup> For more information on the National activities and outcomes see:

<http://www.unep.fr/scp/marrakech/consultations/national>

through broad consultations with all regions and relevant stakeholders and in close cooperation with the Marrakech Process Advisory Committee. An initial draft of the 10 YFP has gone through a round of public consultation, and a second draft will be circulated prior to CSD 17 in May 2009. It is expected that the framework will comprise a range of mechanisms and partnerships to deliver support at national and regional levels for the design and implementation of policies and management practices and adoption of technologies that promote SCP.

The development for a 10YFP builds upon the regional and national needs and priorities identified under the Marrakech Process consultations and the work of the Marrakech Task Forces and other relevant stakeholders. Common priorities have been identified across regions. For instance, most regions have identified some key sectoral priorities such as energy, waste management, water, mobility and housing, agriculture and tourism. Most regions also identified key policies and tools to promote SCP, such as developing national SCP programmes or action plans, utilizing economic instruments, promoting sustainable procurement, and integrating SCP into formal and informal education. Poverty reduction is a cross-cutting issue for most regions (see Table 1).

Table 1. Priorities identified under the Marrakech Process Regional Consultations

PRIORITIES	REGION	AFRICA	ASIA & THE PACIFIC	EUROPE	LATIN AMERICA & THE CARIB-BEAN	ARAB REGION (WEST ASIA)
	<b>PRIORITY SECTORS</b>					
ENERGY		●	○	●	●	●
AGRICULTURE—FOOD		●		●		
HOUSING (BUILDING & CONSTRUCTION)		*		●		●
TRANSPORT / MOBILITY		*	*	●	*	●
TOURISM		*		*	*	●
WASTE		*	●		*	●
WATER		●	●		●	●
<b>PRIORITY SCP PROGRAMMES/TOOLS</b>						
NATIONAL SCP ACTION PLANS/ PROGRAMMES		●	●	●	●	
FINANCE AND ECONOMIC FRAMEWORK FOR SCP		●	●	●	●	●
SUSTAINABLE PROCUREMENT		●	●	●	●	●
SUSTAINABLE PRODUCTS & SERVICES (Labelling & Standards)		●	●	●	●	
EDUCATION, INFORMATION ON SCP & SUSTAINABLE LIFESTYLE		●	●		●	●
ENHANCING BUSINESS COMPETITIVENESS THROUGH SCP (SMEs)		●	●	●	●	●
URBAN & RURAL DEVELOPMENT (SUSTAINABLE CITIES )		●	●	●	●	●
<b>CROSS-CUTTING ISSUE</b>						
POVERTY ALLEVIATION		●	●		●	●

As shown in table 1, for many countries and regions energy, food and water are key priorities where resource efficiency and SCP patterns need to be promoted and implemented. The aim and challenge of the 10YFP is to bring the commitment and action from governments to elaborate and implement programmes in these areas that will support resource efficiency, such as promoting energy efficient products, sustainable mobility, sustainable agriculture, and integrated water management. The overall goal is to contribute to decoupling economic growth from environmental degradation and to build green economies and sustainable societies. As the framework is

designed, governments and other stakeholders have the opportunity to contribute to it and to ensure that the 10YFP addresses pressing resource depletion issues such as those related to energy, food, and water.

### ***Promoting Resource Efficiency and Sustainable Consumption and Production for a Green Economy***

Promoting and implementing holistic and integrated policies and actions towards resource efficiency and sustainable consumption and production would help to address the energy, food and water crises and reduce the threat of climate change. Such policies and actions would also help to build a Green Economy that meets human needs without undermining prospects for future generations. The solutions advocated in the international arena need to reflect a full life-cycle approach that addresses both the supply and the demand sides of the equation.

Concrete recommendations for policies and actions to address the energy, food, and water crises have already been made through the Marrakech Process. Regarding energy, Africa has highlighted the need to accelerate technology transfer and capacity building and to promote the adoption of economic incentives to promote renewable energy and energy efficiency improvements in industry, agriculture and housing. Most regions are working to improve energy efficiency utilizing policies and tools such as energy standards and product labels as well as the promotion of green electricity markets. Eco-labelling is a tool that can potentially be utilized to address all three crises: the African region is exploring the creation of an African Ecolabelling Mechanism in order to promote environmentally sound products and expand market access.<sup>14</sup>

The Intergovernmental Panel on Climate Change (IPCC) has stated that “changes in lifestyles and consumption patterns that emphasize resource conservation can contribute to developing a low-carbon economy that is both equitable and sustainable.” The IPCC highlighted the need for progress in designing and constructing sustainable buildings, increasing demand for sustainable transport, applying management tools to help reduce corporate carbon footprints, and educating consumers about energy-efficient products.<sup>15</sup>

As these efforts proceed, it is important that governments and other actors focus their efforts on those sectors and initiatives that are likely to yield the largest dividends in terms of their environmental, social and economic benefits. The McKinsey Global Institute has demonstrated that there are enormous opportunities for increasing the energy productivity of economies in both industrial and developing countries.<sup>16</sup> The buildings sector, for example, stands out as an obvious target for energy efficiency initiatives. Buildings are responsible for about 40 percent of global energy use and for a comparable share of carbon dioxide emissions. Estimates suggest that fossil fuel use in buildings could be reduced by 70 percent or more utilizing currently available technologies, such as better insulation, more-efficient lighting and appliances, and improved doors and windows, and that these investments would pay for themselves as a result of lower energy bills.<sup>17</sup>

There are a broad range of policy reforms that have proven successful in many countries in encouraging increased energy efficiency as well as greater use of renewable power. These include government regulations such as promotion of waste heat recovery, the development of appliance efficiency standards, and electric utility regulatory reforms that reward utilities for reducing energy costs rather than for maximizing electricity sales. Countries and other relevant actors could use the Marrakech Process to share information and experience about successful policies and initiatives. The 10 YFP could also include implementation mechanisms to scale up those best practices.

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<sup>14</sup> For further information, see [http://www.unep.org/roa/Projects\\_Programmes/African\\_Ecolabelling\\_Mechanism/index.asp](http://www.unep.org/roa/Projects_Programmes/African_Ecolabelling_Mechanism/index.asp).

<sup>15</sup> *Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Summary for Policymakers*, May 2007, p.12.

<sup>16</sup> McKinsey Global Institute, *Curbing Global Energy Demand Growth: The Energy Productivity Opportunity*, May 2007.

<sup>17</sup> Christopher Flavin, *Low-Carbon Energy: A Roadmap*, Worldwatch Report 178 (Washington, D.C.: Worldwatch Institute, 2008), p. 14-15.

The same dynamic could be introduced for agriculture. Food is one of the most resource intensive products, as well as being an essential need. However, there is great potential to shift agriculture in a new direction that is more efficient in terms of its use of energy and water, maintains soil fertility and reduces soil erosion, is less reliant on chemical inputs such as fertilizer and pesticides, and produces fewer greenhouse gas emissions.

In one step in this direction, many countries have dramatically expanded organic agricultural production in recent years. According to the International Federation of Organic Agriculture Movements, more than 30 million hectares of land are currently certified as under organic cultivation worldwide, and the annual global market for organic products is valued at some \$28.6 billion. Organic certification and eco-labeling programs have been an important component of this success. The 10YFP could provide a platform for sharing experiences in this area as well as provide incentives to scaling up successful initiatives.<sup>18</sup>

Efforts are also needed to promote the broader dissemination of agricultural techniques that maintain soil fertility, use water efficiently and contribute less to climate change, including integrated livestock and crop production, agroforestry systems, integrated aquaculture and crop production, large-scale composting of municipal wastes, cover cropping, and low-flow irrigation systems.<sup>19</sup> In one success story along these lines, conservation tillage techniques that minimize plowing and increase water infiltration into soils have been widely adopted in some countries in recent decades, including in Argentina, Australia, Brazil, Canada, and the United States.<sup>20</sup>

The U.N. Food and Agriculture Organisation (FAO) has recently called for greater efforts to expand the adoption of conservation tillage and other sustainable agriculture techniques in order to achieve the Millennium Development Goals on hunger and poverty reduction and on ensuring environmental sustainability. FAO has highlighted in particular the importance of accelerating training programs and participatory research related to conservation agriculture, of building strong farmers' organizations, and of ensuring that newly-developed equipment is made widely available.<sup>21</sup> The 10 YFP could also play an important role in disseminating experiences with policies and capacity building activities which have proven most effective in promoting the shift to more resource efficient and sustainable agricultural practices.

The water crisis also needs to be recognised as an issue of meeting basic needs and increasing efficiency as well as promoting sustainable patterns of consumption. As with energy, there are numerous opportunities for improving the water productivity of the global economy. In the agricultural sector, it will be necessary to deliver and apply water to crops more efficiently and to increase crop yields per liter of water consumed. This can be done by using drip-sprinklers and other micro-irrigation systems, changing cropping patterns and growing methods, and adopting high-yielding and early-maturing crop varieties.<sup>22</sup>

Water pricing reforms can also be powerful tools for helping to encourage more efficient and equitable use of water in agriculture, industry, and in households. Tiered pricing structures, for example, stipulate a low cost for the amount of water needed to meet basic needs but charge a higher premium as the volume of water use increases. And shifting diets can make it possible for people to satisfy nutritional needs with less water: it takes

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<sup>18</sup> For more information, see [http://www.unep.org/roa/Projects\\_Programmes/African\\_Ecolabelling\\_Mechanism/index.asp](http://www.unep.org/roa/Projects_Programmes/African_Ecolabelling_Mechanism/index.asp).

<sup>19</sup> Brian Halweil, Worldwatch Institute, private communication, February 7, 2009; Sara J. Scherr and Sajal Sthapit, "Farming and Land Use to Cool the Planet," in Worldwatch Institute, *State of the World 2009* (New York: W.W. Norton & Co, 2009).

<sup>20</sup> UNEP, *Global Environmental Outlook 4 (GEO-4)* (Nairobi: 2007), p. 96; Alex Evans, *The Feeding of the Nine Billion: Global Food Security for the Twenty-First Century* (London: Chatham House, the Royal Institute of International Affairs, 2009), p. 37.

<sup>21</sup> FAO, "Farming Must Change to Feed the World," News Release, February 4, 2009.

<sup>22</sup> Sandra Postel and Amy Vickers, "Boosting Water Productivity," in Worldwatch Institute, *State of the World 2004* (New York: W.W. Norton & Co., 2004).

five times more water to supply 10 grams of protein from beef than from rice, and nearly 20 times more water to supply 500 calories from beef than from rice.<sup>23</sup>

The types of measures cited above should be promoted by three inter-linked streams of research and capacity building activities that support the application of policies, management practices and technologies which promote resource efficiency and SCP. The first of these is research on the economic and human welfare case for SCP, examining in more depth the gains that can be made by using resources more efficiently, and in a less polluting manner. There is clear evidence of such gains linked to the application of some individual policies and projects, but the evidence needs to be collected and presented in a clear and accessible form to key decision-makers, supported by a stronger “communications” effort. The second type of activity is capacity building and demonstration projects that need to be undertaken at country level to adapt and support application of SCP policies and tools in these specific contexts. This should be undertaken in collaboration with governments, relevant specialist institutions at national and regional levels and the private sector. The third activity is on measures to promote the dissemination and adoption of resource efficient technologies, including financial and technical support for enterprises to apply these technologies, such as fiscal incentives for their adoption, and public-private and business-to-business partnerships which achieve the same aim. These three sets of activities could usefully be applied in an integrated manner in the context of resource intensive sectors or products.

### ***Points for Discussion***

As discussions on UNEP’s Green Economy Initiative and the Global Green New Deal proceed, it will be important to consider the role of the Marrakech Process and the Resource Panel in the search for solutions. We need to explore how these two initiatives can help to construct a science-based, focused and broadly owned 10 Year Framework of Programmes to support the shift to resource efficient societies and sustainable patterns of consumption and production. The following issues are particularly in need of further exploration.

*What are the specific programmes, capacity building and partnerships that should be developed in the Marrakech Process and during the CSD 2010-2011, and implemented through the 10YFP to help solve the interlinked energy, food, and water crises and build resource efficient economies and sustainable societies?*

- How can we build the capacity of governments to design and implement incentives and demand-side management programmes for energy and water efficiency?
- What are the priority policies, voluntary measures and partnerships (public-private and business-to-business) that could make food supply chains more resource efficient and climate-friendly?
- Which programmes related to energy, water and food should be included in the 10YFP without duplicating existing initiatives, but rather building cooperation and synergies with those initiatives?

*What further scientific assessment and analysis is needed to address these three global crises and to construct resource efficient economies and sustainable societies? What could the Resource Panel contribute to these efforts, consistent with its identification of priorities for sustainable resource management and analysis of data requirements and measures to promote decoupling? Some potential areas of work are as follows:*

- Identifying the scope for decoupling economic growth from environmental damage in key sectors and demonstrating how this decoupling contributes to growth, innovation and human development while at the same time decreasing resource use and pollution.
- Deepening the research base related to management of key resources with a life cycle perspective while making sure that science is more easily and quickly translated into concrete policy relevant advice.

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<sup>23</sup> Ibid.

