



Turning green the strategic way

The role and potential of strategic environmental assessment in securing a green economy

Barry Dalal-Clayton

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Preface

Strategic environmental assessment (SEA) is a powerful process for integrating environmental and linked social and economic concerns into policy-making, planning, programme development, mega projects and development decision-making. Over the last 20 years there has been increasing uptake of SEA around the world. More than 60 countries at all levels of development (including all 27 EU member states) now have legislation, policies, directives or regulations prescribing the application of SEA, and many more are introducing it as part of their policy toolkits – although it is not necessarily used effectively and many development actors are unaware of its function, value and potential. This paper examines these issues and aims to show that SEA has a key role to play in ensuring that countries make the transition to a green economy – an emergent concept that was a central theme at the UN Rio+20 conference in 2012.

There is much discussion and material on the web on SEA and much on green economy and green growth (the two terms are used synonymously in the paper). But there is little that links SEA directly to green economy. And there are few, if any, cases of SEA being applied specifically to green economy purposes (ie being labelled as such). However, there is an increasing number of cases of SEA (particularly in sectoral contexts) that address issues that are directly relevant to promoting a transition to green economy.

This paper provides a preliminary exploration of the links between SEA and green economy, and the role of SEA in supporting policies, planning and decision-making for green growth. It introduces the concept of green economy/growth and considers some of the main international initiatives. But it is not the primary purpose of this paper to analyse or unpack the concept of green economy in detail. Reference is made to other sources where more detailed discussion of the focus, dynamics and progress regarding green economy can be found.

After a brief review of international uptake of SEA, the paper considers the role of this approach in relation to a range of entry points to green economy initiatives: government policies, plans and programmes; climate change and low-carbon growth; sustainable transport; waste management, water and sanitation; ecosystems and sustainable use of biodiversity; sustainable agriculture/food production and supply; green energy and trade. Of course, SEA also plays a key role (perhaps an even more significant role) when applied to development actions that are not specifically designed as green economy initiatives, where it can indicate whether they are likely to result in negative environmental and social impacts that would be considered to counteract green economy aspirations.

The paper then discusses the use of indicators in monitoring SEA and the treatment of social concerns, particularly gender – a key issue that is not always addressed adequately in SEA but is fundamental in relation to securing genuinely equitable green economic development. Throughout, the text is supported by case examples illustrating its application in different contexts relevant to green economy. A final section discusses a range of steps that might be taken to encourage and facilitate increased use of SEA as an environmental mainstreaming tool in support of transitioning to a green economy.

This paper is not a technical description of SEA processes and procedures or experiences – although it contains some basic discussion of key steps. There are many other texts that serve that purpose. Rather it aims to initiate consideration of, and raise awareness of, the role and potential of SEA in supporting a green economy. To a large extent, this can be achieved by applying SEA,

when and where appropriate, for the purposes for which it is intended, ie to help and improve the development of policies, plans, programmes, mega projects and to support decision-making.

A paper of this nature is difficult to position. It may be too detailed for generalists or those new to SEA, and some technical specialists may feel it is not operational enough. It tries to bridge the gap as far as possible. A key aim of the paper is to bring the green economy and SEA communities together. The former need access to a legally-based, proven approach to achieving the integration of multiple objectives; and the latter community need access to debates on green economy as these are potentially influential for policy-making.

Hopefully this paper will be of interest to a wide range of actors in both communities: planners, decision-makers and investors who have limited knowledge of SEA or are yet to be convinced that it can play a useful role, particularly as regards the green economy; SEA administrators and practitioners seeking evidence or a perspective on the role of SEA in relation to the green economy; as well as academics and students.

[1] Emergence of the green economy debate

Across the world, billions of dollars are now spent annually to subsidise carbon-emitting fossil fuels. But investment in renewable energy remains inadequate², threatening affordable and secure energy supply³. Investment in the agricultural sector, including water and soil conservation, has actually declined in the last ten years in the developing world, threatening food security when the world's major food producers have been subsidized to grow biofuels instead of food.

As the world emerges from recession, a clear message is emerging with it. 'Business as usual' is not working. In response, the 'green economy' (GE) movement has emerged. The idea of a green economy had its origins in the report "*Blueprint for a Green Economy*" prepared by Pearce, Markandya and Barbier (1989) for the UK Department of the Environment. In a report commissioned by UNEP⁴, Barbier (2009) returned to this theme and explored the potential benefits of a Global Green New Deal (GGND) as a way of combating the recession and also securing long-term economic recovery. The report argued that the preservation and protection of our environment is crucial to long-term economic stability and the fight to alleviate poverty. Any policies aimed at economic recovery must also take into account the environmental challenges we are faced with, such as climate change, pollution and habitat loss.

UNEP'S Green Economy Initiative (GEI) aims to assist governments in "greening" their economies by reshaping and refocusing policies, investments and spending towards a range of sectors, such as clean technologies, renewable energies, water services, green transportation, waste management, green buildings and sustainable agriculture and forests (see: <http://www.unep.org/greeneconomy/>). GEI includes a range of advisory services, partnerships and research products. 'Greening the economy' refers to the process of reconfiguring businesses and infrastructure to deliver better returns on natural, human and economic capital investments, while at the same time reducing greenhouse gas emissions, extracting and using less natural resources, creating less waste and reducing social disparities.

In a major report on the GE, UNEP (2011) identifies 11 sectors which it considers to have potential for the transition to a green economy: agriculture, water, forests and fisheries which are also called natural capital and the sectors of renewable energies, manufacturing, waste, construction, transport, tourism and cities. The report's main conclusion argues that the "ecologisation" of economy does not need to hinder growth. Rather, it has potential as a new engine of growth, a net generator of decent and green jobs and a vital strategy to eliminate persistent poverty. The fundamental objective for the transition to a GE is to allow economic growth and investment, increasing the environmental quality and social inclusion.

The report suggests that, in the short term, economic growth in a green scenario may be less than under 'business-as-usual'; but, in the long term – beyond 2020 – growth will exceed 'business-as-usual' in both traditional measures (GDP growth) as well as more holistic measures (growth per capita). The report also concludes that, in a series of important sectors, such as agriculture, construction, forests and transport, GE offers more employment in the short-, medium- and

[2] The International Energy Agency reports that fossil fuels attracted about \$523 billion in government subsidies in 2011, up by 30% from 2010. That compares to \$88 billion for renewable energy (IEA 2012).

[3] Some might argue that the emergence of non-conventional gas sources (eg from hydraulic fracturing or fracking) offers a 'middle road' – providing an assured energy supply at a lower environmental cost. There is an increasing concern within the conservation community about a number of long-term, hidden environmental costs associated with so-called 'green' energy, eg bird and bat mortality associated with wind farms.

[4] As a 'backbone' for developing its Green Economy Report (UNEP 2011).

long-term than 'business-as-usual'. In sectors where natural capital and ecosystem services are seriously depleted, such as fishing, the transition to GE will imply a loss of income and employment in the short and medium terms – whilst natural stocks are allowed to recover, but this will prevent permanent loss of income and employment. In such cases, transitory solutions are necessary to protect workers from negative impacts on their subsistence.

The UNEP report interprets GE as “an economy that results in improved human well-being and reduced inequalities over the long term, while not exposing future generations to significant environmental risks and ecological scarcities”. This is a 'do-no-harm' approach. GE is interpreted in different ways and there are several other definitions of green economy/green growth in use (Box 1).

[Box 1] Some definitions of green economy/green growth

According to the OECD, green growth is “the fostering of growth and development while ensuring that natural assets continue to provide the environmental resources and services on which human well-being relies”.

UNEP defines green growth simply as “resource-efficient, low-carbon, climate-resilient & socially-inclusive growth”, and also uses the (interchangeable) term “green economy”.

The World Bank has defined green growth as “a strategy for promoting economic growth while adding an ecological quality to existing economic processes and creating additional jobs and income opportunities with a minimal environmental burden”.

The Global Green Growth Institute also takes a strategic view by stating that it is “growth that leapfrogs the resource-intensive and environmentally unsustainable model of industrial development pioneered by advanced economies”.

The Green Economy Coalition defines green economy as a “fair and resilient economy, which provides a better quality of life for all achieved within the ecological limits of one planet”.

For some, GE is seen as a powerful new paradigm or vision for the 21st century, suggesting creative solutions to multiple global challenges by linking people, planet and prosperity – making more positive use of environmental assets within ecological limits. The innovations or building blocks – social and technological – already exist, or are being developed. They include, for example (see Box 2):

- Low-carbon energy, infrastructure and transport;
- Sustainable systems of food production, water and sanitation, and waste;
- Ways of protecting and sustainably using biodiversity and ecosystem services;
- Green jobs, decent work, sustainable lifestyles and livelihoods that ensure social justice and equity, and set real measures for progress and wellbeing;
- Investment in green sectors, environmental 'accounting' and the introduction of new business models;
- Policy reform.

GE is also interpreted to comprise a set of economic policies and instruments; while others promote GE as a series of micro-level outcomes.

The World Bank's ten year Environment Strategy also adopts a green economy-type approach. It sets out an “ambitious action agenda that seeks to respond to calls from [its] client countries for a new approach to development that supports growth while focusing more on sustainability and ensuring that the environment is a key enabler for green, more-inclusive growth” (World Bank 2012).

[Box 2] Some examples of green economy initiatives

Zero carbon – The European Supergrid

Supergrid is a wide area transmission network that makes it possible to trade high volumes of electricity across great distances, and to take advantage of distantly located renewable sources. It will be the transmission backbone of Europe's decarbonised power sector and will facilitate the trading of electricity across Europe, and strengthen security of supply. It will also create opportunities for European companies to export sustainable energy technology.

The Supergrid currently involves nine countries: Germany; France; Belgium; the Netherlands; Luxembourg; Denmark; Ireland; and the United Kingdom, along with Friends of the Supergrid (FOSG), involving ten companies which will deliver the infrastructure and related technology, together with companies that will develop, install, own and operate that infrastructure. The risks of providing this new transmission service will be reduced by the early knowledge gained during the policy formation and design stages.

Zero waste – Recycling aluminium cans in Brazil

Brazil is the global leader in aluminium can recycling. Over 10 billion cans were collected in 2006. Recycling saves the country nearly 2000 GWh of electricity annually that would be required to produce new aluminium, which is sufficient to supply a city of over one million inhabitants for one year. Recycling aluminium cans provides employment for about 170,000 people in Brazil, which has some 2,400 small companies and cooperatives involved in recycling and scrap metal trading.

The country has pioneered ways to improve recycling jobs, which can be dirty and dangerous and is often poorly paid. Recycling work is undertaken by an informal network of collectors who collect the material for revenue. The formation of cooperatives have helped raise the pay levels and working conditions. In Brazil 90% of recyclable material is collected by scrap collectors – *catadores de lixo* – who have organized themselves into a national cooperative movement with 500 cooperatives and 60,000 collectors in total. Belo Horizonte, one of Brazil's largest cities, launched the first recycling plant in 2005 run by associations of independent collectors. It avoids the middlemen and provides an increase of about 30% to the incomes of collectors.

Sustainable transport – cleaner buses in Colombia

The city of Bogotá, Colombia, has built a novel public transportation system – bus rapid transit (BRT) – called TransMilenio, to reduce congestion and combat climate change. It is used for about 1.6 million trips per day and has allowed the removal of 7,000 small private buses from the city's roads, reducing the use of bus fuel and associated emissions by more than 59% since it first opened in 2001. The buses run on diesel but have high-efficiency engines and emit less than half the pollution of the older minibuses.

The city built seven intersecting bus routes by isolating existing traffic lanes with low walls, creating enclosed stations, and providing free shuttle buses to carry residents from outlying districts to terminals. It has made bus transport accessible to low-income users, while also being profitable for private operators and fundable by the state. Commuting has been reduced by 32%, and the system moves more passengers per mile every hour than almost any of the world's subways. Subways cost more than thirty times as much per mile than a BRT system. TransMilenio was the only large-scale transportation project approved by the UN to generate and sell carbon credits. Developed countries that exceed their emissions can buy credits from TransMilenio to balance their emissions budgets, bringing Bogotá an estimated US \$100-300 million so far. It has inspired the planning of similar schemes in other rapidly expanding cities in India, China, Mexico and Indonesia.

Sustainable food – vertical farming

The world's population is expected to increase by about 3 billion by 2050 and nearly 80% of that population will live in urban centers. It is estimated that we will need 109 million hectares of new land (an area 20% larger than Brazil) to grow enough food to feed the growing population, if traditional farming practices continue as they are practiced today. Over 80% of the land that is suitable for raising crops is already in use.

Vertical farming is a proposed technique involving large-scale agriculture in urban high-rise buildings or 'farm-scrappers', many stories high, situated in the heart of the world's urban centers. If successfully implemented, they offer the promise of urban renewal, sustainable production of a safe and varied food supply, year-round crop production of fruit, vegetables, edible mushrooms and algae. By allowing traditional outdoor farms to revert to a natural state and reducing the energy costs needed to transport foods to consumers, vertical farms could also significantly alleviate climate change, and help restore ecosystems that have been sacrificed for horizontal farming.

There are several trials of vertical farming taking place: Valcent's VertiCrop vertical farming systems pilot plant at the Paignton Zoo Environmental Park in Devon, England; California high-tech greenhouses using vertical farming techniques (Houweling Nurseries); and a vertical farm using seawater in Dubai.

Adapting to climate change in Oceania

Mangroves are estimated to contribute up to US \$900,000 per km² annually in ecosystem services such as protecting foreshores, fisheries production and supply of building materials (e.g. timber), tourism and recreation and improving water quality. They are very important in mitigating the adverse effects of climate change in the Oceania region – where it is anticipated that sea-level rise and flooding resulting from climate change will make things worse for vulnerable coastal areas and communities. But mangroves are threatened by coastal development, population dynamics and increasing demand for resources.

A new project '*Mangrove Ecosystems for Climate Change and Livelihoods*' (MESCAL), was launched in the Solomon Islands in 2010 to help mangrove managers and scientists from Fiji, Samoa, Solomon Islands, Tonga and Vanuatu and Pacific Islands to protect and conserve their mangroves, to improve livelihoods and build resilience to the impacts of climate change on coastal zones. It will develop a clear action strategy informed by multiple stakeholders.

Source: www.greeneconomycoalition.org

Recognising that all sectors have a stake in driving the transition – that none can do so alone, a new grouping has emerged to address the challenge: the Green Economy Coalition (Box 3). The coalition brings together three levels of attention that have tended to be treated separately – micro, macro and paradigm levels – to forge new ideas of economic governance. The coalition has defined nine key principles for a green economy (Box 4).

[Box 3] The Green Economy Coalition

The Green Economy Coalition (GEC) brings together environment, development, trade union, consumer and business sectors from North and South. It is committed to accelerating a transition to a new green inclusive economy. The GEC fosters a common understanding of green economy themes, and promotes learning, creativity and innovation across sectors. It aims to:

- improve communication between stakeholders and among green economy initiatives;
- forge a coherent new development vision that works for all;
- encourage that best practice is scaled up;
- promote ways of halting bad practice;
- encourage innovation that explores prosperity within planetary boundaries;
- influence key decision-makers.

The GEC has supported a series of regional and national dialogues to address what a green economy will mean – and how it can be achieved – in the specific context of particular region's or country's own set of unique ecological, economic and cultural circumstances. The coalition has also supported an online global consultation on the principles of a green economy.

See: www.greeneconomycoalition.org

[Box 4] Principles of a Green Economy

Through a series of national and regional dialogues and an extensive global online consultation process, the Green Economy Coalition has compiled a set of nine principles for a green economy:

1. The Sustainable Principle. A green, fair and inclusive economy is a means to deliver sustainability

- One of the vehicles to deliver sustainable development – not a replacement for it.
- Respects its dependency on a healthy environment and it strives to create wellbeing for all.
- Addresses all three dimensions (environmental, social and economic) and develops policy mixes that integrate and seek the best results across all of them.

2. The Justice Principle. A green, fair and inclusive economy supports equity

- Supports equity between and within countries and between generations.
- Respects human rights and cultural diversity.
- Promotes gender equality and recognises knowledge, skills, experience and contribution of each individual.
- Respects indigenous peoples rights to lands, territories and resources.

3. The Dignity Principle. A green, fair and inclusive economy creates genuine prosperity and wellbeing for all

- Alleviates poverty.
- Delivers a high level of human development in all countries. It provides food security and universal access to basic health, education, sanitation, water, energy and other essential services.
- Transforms traditional jobs by building capacity and skills, respects the rights of workers and actively develops new, decent green jobs and careers.
- Achieves a just transition.
- Acknowledges the contribution of unpaid work. It promotes the self-empowerment and education of women.
- Supports the right to development if delivered in a sustainable way.

4. Healthy Planet Principle. A green, fair and inclusive economy restores lost biodiversity, invests in natural systems and rehabilitates those that are degraded

- Recognizes its dependency on the productivity of ecosystems and biodiversity.
- Does not violate, disrupt, or overstep ecological boundaries and commits to co-operate within them, including reducing pollution, safeguarding ecosystems, biodiversity integrity, other natural resources including air, water, soil, and bio-geochemical cycles.
- Ensures that environmental integrity is maintained before allocating resources among competing uses.
- Ensures an efficient and wise use of natural resources, including water, natural gas, oil and mineral resources, without compromising future generations prospects.
- Supports the respect of all forms of life.
- Applies the precautionary principle.
- Assesses the potential impact of new technologies and innovations before they are released.
- Assesses the environmental impacts of economic policies and seeks to find the least disruptive, most positive benefit for the environment and people.
- Promotes the restoration of balance between ecological and social relations.

5. The Inclusion Principle. A green, fair and inclusive economy is inclusive and participatory in decision-making

- Is based on transparency, sound science and the visible engagement of all relevant stakeholders.
- Supports good governance at all levels from local to global.
- Empowers citizens and promotes full and effective voluntary participation at all levels.
- Respects cultural values, is tolerant of religious views and lifestyle choices, and sensitive to ethical considerations.
- Builds societal awareness, developing education and skills.
- Is transparent, inclusive and participatory, giving equal opportunities to, and advocating further for the rights of, young and old, women and men, poor and low skilled workers, indigenous peoples, ethnic minorities and local communities.

6. The Good Governance and Accountability Principle. A green, fair and inclusive economy is accountable

- Provides a framework to structure markets and production in consultation with all stakeholders.
- Reports its sustainable progress on environmental, social and economic measures, in company, national and international accounts.
- Achieves transparency.
- Promotes international cooperation and defines international liability.
- Promotes global policy coherence and fair international cooperation.
- Promotes common but differentiated responsibilities.
- Commits to international human rights standards and environmental agreements.

7. The Resilience Principle. A green, fair and inclusive economy contributes to economic, social and environmental resilience

- Supports the development of social and environmental protection systems, and preparedness against and adaptation for climate extreme events and disasters.
- Creates a universal social protection floor.
- Promotes a variety of green economy models relevant to different cultural, social and environmental contexts.
- Considers indigenous local knowledge and promotes the sharing of diverse knowledge systems.
- Builds on local skills and capacities and develops these further.
- Supports sustainable, diverse economies and local livelihoods.
- Promotes systems approaches, recognising the interdependence and integrated nature of these systems, underpinned by culture and ethical values.

8. The Efficiency and Sufficiency Principle. A green, fair and inclusive economy delivers sustainable consumption and production

- Seeks to ensure prices reflect true costs incorporating social and environmental externalities.
- Implements the polluter pays principle.
- Supports life-cycle management, and strives for zero emission, zero waste, resource efficiency and optimal water use.
- Prioritises renewable energy and renewable resources.
- Seeks absolute decoupling of production and consumption from negative social and environmental impact.
- Delivers sustainable lifestyles supporting a major cultural transformation.
- Promotes social, economic and environmental innovation.
- Gives fair rights to access intellectual property within a global legal framework.

9. The Generations Principle. A green, fair and inclusive economy invests for the present and the future

- Delivers inter-generational and intra-generational fairness.
- Promotes conservation of resources and the quality of life over the long term.
- Influences and regulates the finance sector so that it invests in the green, fair and inclusive economy and achieves a stable global monetary system.
- Prioritises long-term, scientifically-sound, decision-making above the short-term.
- Promotes equitable education at all levels and sustainability education for children.

Source: <http://www.greeneconomycoalition.org/updates/sign-9-principles-green-economy>

In June 2009, OECD ministers adopted a Declaration on Green Growth and the OECD has developed a Green Growth Strategy. This includes a green growth 'policy toolkit' focusing, for example, on: green jobs and social aspects; green taxes and regulatory approaches; industrial restructuring and renewal; fiscal consolidation; green technologies; green indicators; peer reviews; co-operation between OECD countries and emerging economies; and involvement of stakeholders (see: http://www.oecd.org/document/10/0,3343,en_2649_37465_44076170_1_1_1,00.html).

Building on the findings of the Green Growth Strategy, in June 2012, the OECD released a draft report for consultation at Rio+20 on *Green Growth and Developing Countries* (OECD 2012a). It aims to connect developing countries to the wealth of OECD's experience, expertise, diagnostics, policy and measurement frameworks on the topic of green growth and development. The draft reviews economic growth and environmental trends over recent years and speculates on how economic and social trends will evolve in the years to come. Relevant national frameworks and a range of policy instruments (national and local, public and private) are articulated. The report provides a conceptual outline for green growth in a developing country context. It provides a rationale for green growth, and examines the concerns held by some developing countries about the green growth agenda informed by a series of continuing consultations. The draft report (section 3.5) identifies SEA as a key mechanism for integrating development and environment interests in pursuing a green growth strategy. The final report is due to be published by June 2013.

Despite the varied perspectives of GE, the emphasis remains on linking both the environmental and economic dimensions of sustainable development, although the main emphasis is on economy. In a speech to African ministers of finance, planning and economic development in Ethiopia⁵, Achim Steiner, Executive Director of UNEP, noted that "the green economy is not a substitute for sustainable development, but a way of realising it".

[5] On 28 March 2011 – see <http://www.unep.org/Documents/Multilingual/Default.asp?DocumentID=2636&ArticleID=8675&l=en&t=long>

Some countries are strongly promoting green growth. For example, Korea and Mexico have made green growth a central policy platform and have used their respective Presidencies of the G20 to generate consensus on the green growth theme. Korea has enshrined green growth in its national development strategy and established a Presidential Committee on Green Growth. It has also established the Global Green Growth Institute (GGGI) as an inter-disciplinary, multi-stakeholder organisation to promote green growth⁶. The GGGI is now working with developing countries on 'green growth planning' including Ethiopia, Cambodia, Brazil, Guyana, Kazakhstan, Mongolia, Papua New Guinea and Philippines. But while more countries are showing interest in the concept of green economy, others remain concerned that it could foster protectionism and restrict trade. For example, Venezuela and Bolivia have criticised the green growth approach on the basis that it is another form of green capitalism and global imperialism. Meanwhile, civil society appears to be divided on the concept of green economy.

Of course, even though not presented under a green economy label, for some years now many companies have been taking steps to adopt green measures in their operations. A large body of corporate policies and practices is now in place to address the adverse environmental and social impacts of industrial or other economically-driven activities and, more optimally, to promote positive measures and steps towards the redesign of products, processes and services on a sustainability basis. This is captured in the application by business of such approaches as the 'triple bottom line' (Elkington 1994), corporate social responsibility (see Hopkins, 2008) and The Natural Step (see http://www.naturalstep.org/com/TNS_for_business/). At the international level, such work has been driven by the World Business Council on Sustainable Development (www.wbcsd.org). In some cases, however, companies have been criticised for applying little more than 'greenwash' – a patina of green language without genuine changes towards green actions in practice. But, in the main, corporate private sector efforts reflect wide acceptance that sustainability is not a peripheral element of good business practice, but is at its heart. This is not born out of philanthropy but out of an enlightened self interest that recognises that the traditional business goals of survival, profit and growth are intricately linked to environmental and social performance – environmental sustainability underwrites economic sustainability. It is now also recognised that there is competitive advantage in a company going beyond compliance with legislation and being seen to be sincerely committed to the broader societal goals that sustainable development requires (Chapter 10 in Dalal-Clayton and Sadler, 2011).

In November 2011, the South African Government, business organisations, trade unions, community organisations and other social partners signed a comprehensive Green Economy Accord⁷ at parliament, which commits signatories to a partnership to build and grow the green economy and create 300,000 jobs over 10 years. The Accord also contains a monitoring and evaluation mechanism to ensure that its goals are met.

Despite progress, there remains significant controversy about the concept of green economy. Civil society in particular remains divided. As Benson and Greenfield (2012) note about debate on green economy at Rio+20:

"The key issues raised by Major Groups and other stakeholders cluster around the following themes. First, that the policy tools associated with a green economy such as Payment for Ecosystem Services (PES) put economic values on our environment, thereby further cementing the capitalist model rather than reforming it. Grassroots campaigns such as 'No to a green economy' have formed to reject the commodification of nature. Indigenous and community groups stress that a green economy approach is already sanctioning land grabs and cite evidence from Bolivia and Uganda. Similarly, the ETC group published 'Who Will Control the Green Economy' describing

[6] See <http://www.gggi.org/>

[7] Available at <http://www.info.gov.za/view/DownloadFileAction?id=159756>

how the world's largest companies are now preparing for a post-petrochemical future by securing access to biomass and any associated technologies, which is driving a new dawn of bioengineering and the exploitation of natural resources. The second area of contention is whether green growth can indeed be inclusive and there is mixed evidence that policy tools to drive resource efficiency, such as certification or public procurement, can help poor communities. Finally, and relatedly, civil society groups are concerned that developed nations will use the guise of green economy and green growth to evade their responsibility to curb their own consumption patterns or tackle growing global inequality”.

In the build-up to the UN Rio+20 summit in Brazil (June 2012), many countries and organisations undertook preparatory work to consider what a GE might mean in the context of their own particular ecological, economic and cultural circumstances, and a range of regional workshops were organised. For example, In April 2012, WWF facilitated an East African conference on GE in Maputo which produced a 'roadmap' – a proposed integrated framework – for a green economy in Mozambique which includes developing integrated planning tools and procedures (economic, social, ecological), such as SEA, to support the country's next Five Year Plan process (WWF 2012).

The Government of the Netherlands, the United Nations Department of Economic and Social Affairs (UN-DESA) and Business Action for Sustainable Development organized a High Level Consultation in April 2012 involving senior business executives and ministers or equivalent level government representatives. The discussions were on how best to cooperate to promote movement towards an inclusive and green economy and address critical private sector issues.

The main outcome document of Rio+20, *The Future We Want*⁸, contains a whole section devoted to green economy in the context of sustainable development and poverty eradication. This recognises that:

“Each country can choose an appropriate approach in accordance with national sustainable development plans, strategies and priorities” (para 59);

and encourages:

“Each country to consider the implementation of green economy policies in the context of sustainable development and poverty eradication, in a manner that endeavours to drive sustained, inclusive and equitable economic growth and job creation, particularly for women, youth and the poor” (para 62);

and recognises:

“The importance of the evaluation of the range of social, environmental and economic factors and encouraging, where national circumstances and conditions allow, their integration into decision-making (Para 63) (a key role of SEA).

An analysis by the Green Economy Coalition of the green economy context post Rio+20 points to an escalation of green economy activity. However, it resides predominately in the business and government spheres. Consequently, the issues dominating the green economy agenda are resource efficiency, resilient supply chains, low-carbon energy, food and water security and, more generally, stimulating economic growth. These discussions are not explicit enough in their attempts to achieve more inclusive economic reform that delivers poverty reduction and improved ecosystem health⁹.

[8] Available at: <http://www.uncsd2012.org/content/documents/814UNCSD%20REPORT%20final%20revs.pdf>

[9] Available at <http://www.greenecomonycoalition.org/sites/greenecomonycoalition.org/files/Background%20paper%20%28LIVE%20DRAFT%20FOR%20COMMENT%29.pdf>

As discussed above, political and institutional support for the concept of the GE is gathering momentum, particularly in developed countries. Whilst there persists a view of GE as a 'northern protectionist' idea in some developing countries, in others there is an emerging view in support of the concept. For example an article in the Zambia Daily Mail (9 February 2011) comments: *"Investing in the green economy is not an optional expense. It is a smart investment for a more equitable, prosperous future"*¹⁰.

GE has begun to be used in political party campaigns (eg in the UK) and a range of countries have already introduced GE-related laws. For example, a Green Energy and Green Economy Act was passed in May 2009 by the Canadian province of Ontario. This places a priority on expanding Ontario's use of clean and renewable sources of energy including wind, water, solar, biomass and biogas power. And, in December 2010, the UK's coalition government introduced an Energy Bill designed to provide for a step change in the provision of energy efficiency measures to homes and businesses, and to enable and secure, low carbon energy supplies and fair competition in the energy markets.

It is likely that an increasing range of laws and policies, plans and programmes (PPPs) will be promoted to encourage and take to scale and wider uptake the kinds of initiatives listed in Box 2 (many more examples are available at www.greeneconomycoalition.org).

A range of tools, instruments and strategies are available to promote green growth/economy. The OECD (2011) discuss the policy framework for green growth, covering: policy design, market instruments, regulations and the regulatory environment, changing consumer behaviour, innovation, investing in infrastructure, and issues to do with institutions and governance, and how to measure progress. In a recent draft report, the (OECD (2012a) examines policy frameworks for green growth in developing countries and considers a range of policy instruments:

- Payments for ecosystem services;
- Sustainable public procurement;
- Shifting subsidies from "brown" towards green growth;
- Environmental taxes/environmental fiscal reform;
- Green energy investment frameworks and incentives;
- Certification of sustainable production and trade;
- Green innovation;
- Inclusive green social enterprise;
- Green growth institutional mechanisms for continuous improvement;

and institutional mechanisms for continuous improvement:

- National Councils for Sustainable Development;
- Green accounting processes and alternative development measures "beyond GDP";
- Public expenditure review;
- Strategic Environmental Assessment (SEA).

Amongst these, SEA is increasingly being formalised in legislation and with government institutions responsible for its application.

[10] Available at: <http://www.daily-mail.co.zm/media/news/viewnews.cgi?category=19&id=1235389978>

[2] International uptake of strategic environmental assessment

To achieve the transitions promised by the green economy concept requires that environment is fully integrated in policy-development, planning, decision-taking and development investment-making. A wide array of tactics, tools and approaches for such integration is available, and the opportunities and challenges of mainstreaming the environment are discussed by Dalal-Clayton and Bass (2009) (see also www.environmental-mainstreaming.org).

Strategic environmental assessment (SEA) is an umbrella term for a range of analytical and participatory approaches that aim to integrate environmental (and linked social and economic) considerations into policies, plans and programmes and assess their potential development effectiveness and sustainability. SEA has emerged over the last 20 years as one of the most prominent processes for environmental mainstreaming and is now the subject of an increasing literature (for a review of SEA-related projects and academic literature, see Fischer and Onyango 2012). Its potential to play a key role in both advancing the GE ideal and realising the MDGs is increasingly being recognised. Indeed, the International Association for Impact Assessment made “Transitioning to the Green Economy – contributions of Impact Assessment” the focus of its 2010 annual conference in Geneva¹¹.

There is growing uptake of SEA around the world: it is estimated that over 60 countries at all levels of development (including all 27 EU member states) now have legislation, policies, directives or regulations prescribing the application of SEA, and many more are introducing it as part of their policy toolkits (Sadler 2011., and B.Sadler, pers.com.). For a review of international experience of SEA, see Dalal-Clayton and Sadler (2005); and for guidance on applying SEA in the context of development cooperation, see OECD DAC (2006).

In the *Paris Declaration on Aid Effectiveness* adopted in 2005¹², donors and partner countries committed to “develop and apply common approaches for SEA at the sector and national levels” (section 4I). In response, the role and potential of SEA in development cooperation was set out in guidance published by the OECD DAC (2006) (available at www.seataskteam.net), and recent experience of its application in development cooperation is described in a number of publications, eg Frey *et al.* (2011), Loayza (2012), OECD (2012b).

An OECD policy on SEA (2008) recognises the value of SEA to:

- safeguard environmental assets for sustainable poverty reduction and development;
- build public engagement in decision-making;
- prevent costly mistakes by alerting decision-makers to potentially unsustainable development options at an early stage in the decision-making process;
- simplify project-level EIA requirements, thereby speeding up subsequent implementation of projects and programmes; and
- facilitate transboundary cooperation around shared environmental resources and contribute to conflict prevention.

[11] See <http://www.iaia.org/iaia10/proceedings/default.aspx>

[12] See <http://www.oecd.org/dac/effectiveness/parisdeclarationandaccraagendaforaction.htm>

Fischer (2009) discusses two key roles of SEA in 'greening' decision-making:

- *Providing for 'green' information* – through the description of the environmental baseline, the identification and evaluation of different options in terms of their environmental impacts, the determination of impact significance for each of them and the depiction of ways to avoid, minimize, mitigate or compensate remaining impacts and the formulation of recommendations¹³.

Greening within SEA may be addressed through different methodological approaches. Different environmental components (eg air, water, flora, fauna) are often assessed in different ways, based on, eg quantitative and qualitative methods and techniques¹⁴.

SEA offers a process that enables 'green' aspects to be considered more systematically in developing policies, plans, programmes and mega projects (PPPP) – through providing for a systematic and participatory decision-support process that can either accompany or structure the underlying PPPP.

- *Greening outcomes through SEA*. SEA is needed as PPPPs often tend to give insufficient consideration to 'green' aspects. It aims to lead to changes to or in a PPPP or even a related PPPP. Changes can be either direct (eg in the design of the PPPP or environmental management commitments/conditions) or indirect – in the medium to long term (eg leading to changed attitudes or values of those involved in the process, or changes in established routines of institutions).

But there is no prescriptive, 'one size fits all' approach to SEA. It needs to be adapted and tailor-made to the context in which it is applied. But at the plan and programme level, good practice SEA usually involves the four stages shown in Figure 1, adapted from the characteristics of environmental impact assessment (EIA). In policy-making, usually this will not be possible, because of the complex, non-linear character of this process. Effective SEA, particularly at the policy level, also depends on an adaptive and continuous process focused on strengthening institutions and governance rather than just a simple, linear, technical approach, as is often found in EIA (Figure 2). This is a significant challenge. A recent evaluation of six World Bank SEA pilots which focused on an institutions-centred approach drew a number of key lessons (World Bank 2011):

- SEA can, under conducive conditions, contribute to improved formulation and implementation of sector reform;
- Ownership, capacity and trust are necessary conditions for effective environmental mainstreaming at the policy level, and long-term constituency building is needed. These requirements mean that the potential benefits of policy SEA must be clearly articulated;
- Contextual factors are of overriding importance in determining whether the main benefits of policy SEA are attained.

[13] "Normally, whilst SEA provisions include suggestions for specific environmental aspects to be considered, frequently there are no binding (eg legal) requirements, and the choice of relevant components is left to the discretion of the assessor. This is why different environmental aspects/issues have been observed to receive varying degrees of attention in SEA. 'Greening' may thus only be happening in terms of certain aspects, which may not necessarily be determined by need, but rather by availability of data or political considerations" (Fischer 2009).

[14] "The choice of a particular method may depend on specific sectoral traditions (eg modelling in transport planning and overlay mapping in land use planning)" (Fischer 2009).

[Figure 1] Basic stages in SEA for plans and programmes

1. Establishing the context for the SEA

- Screening – to decide whether an SEA is appropriate and relevant in relation to the development of a policy, plan or programme (PPP) in the area under consideration.
- Setting objectives of the SEA: how does it intend to improve the planning process; what is its role?
- Identifying stakeholders and development of public engagement and disclosure plan.
- Securing government support.
- Undertake preparatory tasks.



2. Implementing the SEA

- Scoping (in dialogue with stakeholders) – to establish content of SEA, decision criteria and suitable 'indicators' of desired outcomes (include in scoping report).
- Establish participatory approaches to bring in relevant stakeholders.
- Collecting baseline data for the potentially affected environment and social system.
- Analysing the potential effects of the proposals and any alternatives (direct and indirect or unintended, as well as cumulative).
- Identifying how to enhance opportunities and mitigate impacts.
- Establish measures for quality assurance to ensure the credibility of the assessment (eg independent review, internal audit).
- Prepare report – typically covering:
 - The key impacts for each alternative;
 - Stakeholder concerns including areas of agreement and disagreement, and recommendations for keeping stakeholders informed about implementation of recommendations;
 - The enhancement and mitigation measures proposed;
 - The rationale for suggesting any preferred option and accepting any significant trade-offs;
 - The proposed plan for implementation (including monitoring);
 - The benefits that are anticipated and any outstanding issues that need to be resolved;
- Guidance to focus and streamline any required subsequent SEA or EIA process for subsidiary, more specific undertakings such as local plans, more specific programmes and particular projects.



3. Informing and influencing decision-making

- Making recommendations (in dialogue with stakeholders).



4. Monitoring and evaluating

- Monitoring decisions taken on the PPP.
- Monitoring implementation of the PPP.
- Evaluation of both the SEA and the PPP in question.

Source: OECD DAC 2006

[Figure 2] Steps to address institutional considerations in SEA

1. Institutional and governance assessment

- Review of country environmental management and governance systems.
- Review of analytical capacity.
- Gain access to decision-making.



2. Institutional and governance strengthening

- Support to increase social accountability and improve governance.
- Adaptive learning – ensuring continuity in SEA processes.

Source: OECD DAC 2006

[3] Role of SEA in advancing effective green economy uptake

A World Bank report on greening growth through SEA argues that SEA is well placed to play four key roles in helping promote GE (Loayza et al., 2011) – because it:

- Organises a process of **dialogue**:
 - between economic and environment/social communities;
 - gives a voice to the weak stakeholders and long term interests;
- Provides **information**:
 - on the economic value of environmental services and assets;
 - on how to best combine short term and long term growth;
- Helps identify how to improve **institutions**:
 - by analysing gaps and weaknesses;
 - by providing options for innovation and strengthening;
- Prepares for **change**:
 - by addressing major trend and drivers (eg climate change, population growth, scarcity of resources which leads to rising prices).

For SEA to fulfil its potential to support green growth and the emergence of a green economy, its promoters and practitioners will need to demonstrate clearly that SEA can show how particular proposed or potential innovations (eg new policies, investment in low-carbon technology, green sectors and jobs, or changing food production or waste management systems) or trade arrangements could generate positive environmental and social outcomes whilst also generating economic growth. But equally, SEA will need to signal when there is a need for caution by indicating that particular innovations or activities could themselves inadvertently result in negative environmental or social impacts. Not all green growth initiatives are likely to be truly sustainable. For example, improperly planned hydroelectric projects can cause many direct and indirect negative environmental effects such as flooding, erosion, earthquakes and mercury release. Energy and materials used to produce the massive amounts of concrete can also be unsustainable. SEA can be used to stress test a green growth initiative to more thoroughly assess the sustainability parameters.

Although GE-based or GE-inspired PPPs will be initiated with underlying positive environmental aims, this will not guarantee that, in their development and implementation, the strategic and potentially unforeseen wider environmental considerations are assessed and taken into account in an integrated way along with linked economic and social concerns. Indeed strategies and proposals specifically aimed at delivering environmental benefits are often exempt from assessment, despite evidence that they can be poorly thought-through and sometimes counter-productive, and initiatives initially appearing green can, in practice, have negative environmental and social impacts (Box 5) – usually in very different spheres, eg biodiversity impacts of carbon-offsets.

It is important to show clearly how SEA can be applied to assess how innovations are likely to impact on key concerns driving the green economy such as climate change adaptation, ecosystem services and biofuels. It is for this reason that the OECD DAC Environet SEA Task Team has already developed a series of Advisory Notes to show how SEA can help in relation to such issues (OECD DAC 2010a,b, and 2011).

[Box 5] When green is not necessarily green

A. South Korea's Green Growth Strategy, set out by President Lee Myung-bak in 2008, has been criticised by South Korean environmental studies professor Sun-Jin Yun (Seoul National University) for being too narrow to achieve sustainable development and masking an agenda that isn't so environmentally friendly. He comments: *"The word 'green' as used by the South Korean government functions as a modifier to hide the active pursuit of growth. Green is accepted as a significant factor only when it contributes to economic growth. Consequently, the original concept of green has been distorted, while the government has pre-empted the green discourse of the domestic environmental movement and created what amounts to a growth-biased green discourse".*

Sun-Jin notes that the backbone of the Green Growth Strategy is the Four Major Rivers Restoration Project – a massive engineering project that includes construction of 16 dams and dredging as the main elements in preparation for canals to link the rivers: *"Its essence is the building of weirs and the use of dredging for flood control and drought prevention as an adaptation to climate change. This approach is more in keeping with the 19th century rather than the 21st century, where the goal has been to remove dams and levees and to allow rivers to reclaim their natural course. Nevertheless, the Four Major Rivers Project accounts for 36.8% of the budget for the government's Green New Deal, the highest share, followed by railroad construction (24.5%). Both projects are land development-related, and are neither green nor prone to produce growth. In this respect, they do not fit into the main strategies for green growth identified by the government. In particular, the most problematic aspect of the four-river project is that it has been promoted without any social consensus or support from the public. Polls show that more than 70% of Koreans criticize the project not for restoring but for killing the ecosystem of the four rivers. Also, the way the government has proceeded – effectively ramming it through without respect for due legal processes – is suspected of violating a number of laws, including the Korea Water Resources Corporation Act, the River Act, the State Finance Act and laws relating to environmental policy, environmental impact assessment, cultural asset protection and so on".* (For more, see: http://www.globalasia.org/V5N2_Summer_2010/Sun-Jin_Yun.html).

B. Whelan and Fry (2010) discuss the case of **agri-environmental schemes** where local farm-scale actions are expected to generate large-area cumulative effects on soil and water quality, biodiversity or landscape. Based on analysis of 'landscape protection' under the Irish Rural Environmental Protection Scheme (REPS), they provide evidence that the benefits of such schemes have often been assumed rather than planned for; thus necessitating *ex-post* assessment to justify their continuance, and argue the need that such proposals be subject to assessment.

C. The proposed **Malagarasi Hydro Power project**, an 8MW, run of river facility in a remote location of northwestern Tanzania, was also considered by the Millennium Challenge Corporation (MCC) to be a "green" and sustainable alternative to meet local energy needs, based on available information. So it was one of several energy-related projects included in the 2008 grant financing agreement between the Government of Tanzania and MCC. However, Hovland *et al.* (2010) report that a robust initial environmental and social impact assessment showed that several aquatic species endemic and unique to the hydropower site could be at risk. They question whether the risk of biodiversity loss is worth the gain of clean, renewable energy, and consider how donors should weigh the risk of biodiversity loss against social development needs in communities that are poor, have no reliable electricity, and need power for development.

To promote the case to use SEA in support of achieving a transition to a green economy, clear case evidence is needed to demonstrate how SEA has successfully and beneficially influenced particular policies, plans or programmes. Fischer (2009) summarises some of the empirical evidence from the professional literature on the greening effect of SEA (Box 6).

[Box 6] Evidence of the influence of SEA

Therivel and Minas (2002) reflected on environmental / sustainability appraisal (ie SEA) practice in English local land use planning. They found that overall, 70% of all appraisals had led to concrete plan changes, increased from 50% found during an earlier study (Therivel 1995).

Fischer (2002) analysed 60 SEAs for spatial and transport policies, plans and programmes from the UK, the Netherlands and Germany. In the transport sector, SEA application had led to a significantly larger consideration of explicit sustainability objectives, targets and proposed measures.

In a study on the learning potential of SEA in three case studies from the UK, Germany and Italy, each of the SEAs had led to concrete changes in the underlying plans (Kidd *et al.*, 2008; Fischer *et al.*, 2009). In the case of a regional spatial plan in Germany, for example, the SEA had resulted in between 5% and 10% of the areas for raw material extraction changing. Furthermore, 13 land use changes (about 4% of total suggested changes) arose, based on comments made during SEA consultation (Fischer *et al.*, 2009). Furthermore, in the three countries, SEA was identified to have led to changes in institutional routines and values (Gazzola *et al.*, 2011).

All cited in Fisher (2009).

[3.1] SEA and policies, plans and programmes

SEA is a key means to address the concerns discussed above and, ideally, should be embedded within the PPP development process. Indeed, some jurisdictions have already linked SEA requirements to green economy policies and plans. For example, the 455 operational programmes at the heart of the EU's Cohesion Policy¹⁵ are 'green-proofed' prior to approval by the European Commission. Member States have to submit an SEA to ensure their programmes respect EU environmental rules. An environmental impact assessment must also be carried out for certain Community-financed schemes, e.g. major transport projects. In another example, an SEA was undertaken in 2007 to support the preparation of Scotland's Second National Planning Framework (NPF). Part of the process involved identifying the respective environmental effects of several strategic alternatives (each underpinned by the overall aim of sustainable economic growth) to help the selection of a 'preferred option' (Table 1). One of the alternatives focused on sustainability issues, including enhancing environmental quality and building climate change into policy-making (ie green growth).

SEA provides a process to evaluate the linkages between investments and the environment, health, job creation, economic diversification and poverty reduction. And it can also open new mechanisms for inter-governmental and societal dialogues to reach consensus on GE-linked development priorities, for example, by bringing weak and strong stakeholders together and identifying policy, capacity and legislative weaknesses in institutions. All of these attributes make SEA a valuable support process to advance the goals of GE by improving the development and implementation of GE-related policies, plans, programmes and mega projects.

Slunge *et al.* (2011) argue that strategic environmental and social assessment (SESA) – a form of SEA promoted by the World Bank which also deliberately targets social issues – can strengthen institutions and governance needed for managing diverse environmental and social impacts related to REDD+. More specifically, they suggest that SESA can enhance policy-making and governance through focusing attention on environmental and social priorities, strengthening constituencies for policy change and improving social accountability. But in order for SESA to contribute to these outcomes, it needs to be assured that broad national "ownership" is achieved and that it becomes

[15] The EU launched its Cohesion Policy in 2009 committing €105 billion for investment in the "green economy" with the objective to deliver sustainable growth, jobs and competitiveness. Over half of the envelope (€54 billion) is designed to help Member States comply with EU environmental legislation. Improvement of water and waste management alone accounts for €28 billion of the total. (<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/369&format=HTML>).

[Table 1] Strategic alternatives for Scotland's Second National Planning Framework

Alternative	Key findings of SEA
Growth and development of the economy is the overriding priority of the NPF.	Raises some questions in relation to aspects of the environment, but did not prove as negative as might have been expected, partly due to a growing recognition on the part of the business sector of the importance of the place-making agenda, and the links between environmental quality, regeneration and investment
Focus on sustainability issues, including enhancing environmental quality and building climate change into policy-making.	Actively promotes sustainability-driven priorities and projects, and demonstrates the potential role of the NPF in addressing global and national environmental agendas.
NPF defined with 'communities' as the primary policy driver	Offers some significant benefits in relation to the population and health agendas, but also raises questions about how far a disaggregated, bottom-up NPF can help to deliver equitable and sustainable economic growth.
Connectivity is used to define the potential impacts of a NPF that is primarily driven by transport infrastructure improvements, as well as improvements to 'virtual' and communications networks.	Mixed effects suggest that whilst some components could contribute positively to objectives such as sustainable infrastructure provision, others will require careful management to avoid adverse effects on aspects of the environment.
'Business-as-usual', ie not preparing a new NPF, allowing the first framework to remain in place. This leaves strategic and nationally significant developments to be defined at a city, region or local level through development plans, with current development and environmental trends being allowed to continue. This means that there could be continuing pressure for some specific types of development, including onshore wind energy, speculative private sector housing and selective economic investment in areas which are already prosperous.	Limited positive, neutral and even negative effects, given the significant changes in the environmental baseline and policy context since the first NPF was published.

Adapted from Scottish Government, 2007

part of a long-term policy learning process with repeated and sustained stakeholder interaction. Slunge *et al.* suggest that, through strengthening constituencies for policy change, SESa can potentially reduce the risk of regulatory capture of REDD+ by vested interests.

SEA is frequently applied at the sector level. In Mauritius, for example, the sugar sector makes an important contribution to its economy and international trade. At the same time, this sector can harm the natural environment if inappropriately managed. In order to ensure environmental integrity, an SEA was conducted on the Multi-Annual Adaptation Strategy (MAAS) (2006-2015) for the sugar cane sector, for which the EU provides general budget support. The results (Box 7) provided important information for decision-makers in Mauritius, raised considerably the profile of environmental issues in the agenda of EC-Mauritius bilateral development co-operation, and have begun to influence MAAS implementation.

[Box 7] SEA of the Mauritius multi-annual adaptation strategy for the sugar cane sector (2006-2015)

The main components of the MAAS include:

- Improving cost competitiveness of the sugar milling sector via centralisation of milling plants – reducing the number from 11 to 4, accompanied by downsizing the labour force through various compensation packages.
- Mechanisation of field operations to improve the cost competitiveness of sugarcane production and increase sugar cane yield per hectare, and regrouping of small planters to enable them to benefit from economies of scale and improved sugar cane yields.
- Increased the contribution of the sugarcane cluster to national electricity production through installation of new power plants in the remaining mills.
- Producing 30 million litres of ethanol annually from molasses in two sugar factories.
- Managing 5,000 ha of difficult areas under sugarcane through support measures to maintain sugar cultivation and converting the remaining areas to forests, other agricultural uses and integrated resort schemes (IRS).

The SEA concluded that the MAAS is likely to achieve positive environmental effects, but with associated environmental risks:

- Increase transport demand for harvested sugar cane;
- Possible increase in sugar cane burning due to mechanised harvesting;
- Risk of pollution of water courses;
- Generation of coal ash during off-crop operations;
- Generation of 350,000 m³ annually of (potentially polluting) vinasse – a bi-product of alcohol production;
- Risk associated to transport of ethanol;
- Land use changes to potentially polluting activities (other crops, IRS).

The SEA also recommended measures to optimise the environmental performance of sugar cane farming, mainly in relation to: sugar cane burning, use of fertilisers and sustainable agricultural practices, and research on nutrient balance in Mauritius. Finally, the SEA recommended a series of ‘flanking’ mitigation measures for reducing nutrient load to ground waters and coastal waters not strictly related to the MAAS but perceived as important given the ongoing environmental pressure on coastal lagoons in Mauritius.

In order to facilitate the practical use of the main recommendations formulated during the SEA of the MAAS, the SEA suggested indicators for monitoring of the proposed environmental management system by the EC and GoM. It distinguished between core indicators that addressed issues of highest importance for the formal monitoring system, and additional indicators that referred to important considerations which can be addressed through ad-hoc arrangements.

SEA influence on MAAS implementation

By late 2008, it was evident that the results of the SEA were having an influence on the implementation of environmental safeguards and environmental improvement measures. For example:

- Adoption of a green cane harvest and cool burning code of practice, which will help avoid negative impacts of cane burning prior to harvest;
- Within the Field Operations, Regrouping and Irrigation Projects (FORIP) of the MAAS, fertiliser application strictly follows the recommendations of the MSIRI (Mauritius Sugar Industry Research Institute);
- Weed management through appropriate cultural practices that minimise use of herbicides is also practised in FORIP projects;

- Air quality has improved due to investment in improved control equipment (use of electrostatic precipitators rather than wet scrubbers);
- Reduction in the number of hot water discharge points has had a positive impact on water quality;
- Use of coal (50,000 t) and generation of coal ash are being reduced due to cogeneration with bagasse (solid fraction that remains after crushing the sugar cane);
- SO_x and NO_x emissions are reduced due to the modernising of cogeneration facilities;
- Closure of mills will eliminate some discharge points into water bodies and the atmosphere, bringing about a positive impact on both water and air quality;
- Centralised mills are adopting maximum water recycling and, together with efficient water use, this has resulted in decreased water usage and improved quality;
- Appropriate farm planning is expected with upgraded drainage systems - which will minimise surface run-off, as well as improved road infrastructure facilitating transport;
- CTSav (electricity company) made an application for Carbon Emission Reduction credits on behalf of the Central Electricity Board as the beneficiary, although it was turned down as a corresponding approved methodology for coal/bagasse plants was not yet available.

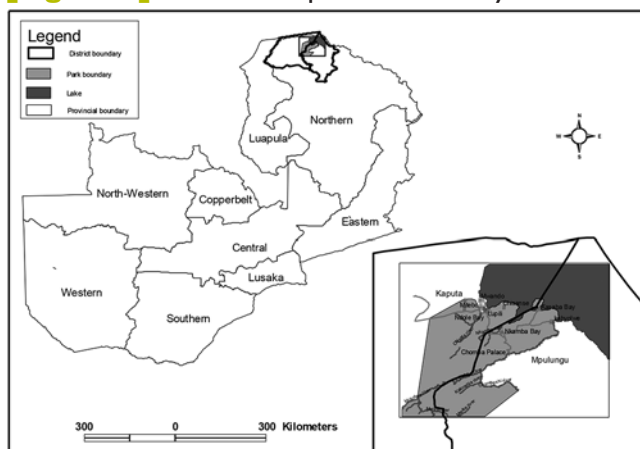
Source: Palerm *et al.* (2011).

In another example, SEA has been applied in Zambia to tourism plans. Two linked SEAs were undertaken in 2009, at a cost of US \$115,000 and funded by the Environment Council of Zambia (now Zambia Environmental Management Agency). The Zambian government planned to unlock investment opportunities in two areas – Kasaba Bay and the Greater Livingstone area (Box 8). The plans focused on opening up the areas to more intensive tourism in accordance with the government's policy of diversifying tourism development. The SEAs aimed to inform the two proposed development plans to ensure they were in line with the Fifth National Development Plan (2006-2010) and the National Policy on Environment (2007) which aim to enable sustainable wealth creation through diversifying the economy.

[Box 8] Tourism-focused SEAs in Zambia

The first SEA concerned a tourism development plan (TDP) for the Kasaba Bay Area in northern Zambia adjacent to Lake Tanganyika (Figure 3) – an area endowed with water-related, cultural and natural heritage resources but under-developed. The second assessed the Greater Livingstone Tourism Area Action Plan (TAAP) covering a traditional tourism destination in the south of the country in Livingstone and Kazungula Districts along the Zambezi river (Figure 4).

[Figure 3] Location map for Kasaba Bay area, Zambia



[Figure 4] Location map for Greater Livingstone area, Zambia



Both SEAs were carried by a multi-disciplinary team of experts through consultations with local stakeholders and review of policies. They also included site visits to each area and surrounding communities. The SEA studies started with awareness meetings for high level officials and planning meetings. The technical teams then developed checklists (matrices) for the assessments. Three development scenarios were also assessed. The alternative solutions were introduced by stakeholders and considered on the basis of expert judgment through scenario construction and forecasting. Preliminary impact and issue analysis was carried out for each of the alternatives proposed. The assessment phase considered the environmental, social, economic and developmental impacts of the proposed interventions.

Key issues

The key issues surrounding the Kasaba Bay TDP included securing the tourism development resource, improved accessibility to the area, security, settlements, waste management, disease

burden, socio-economic benefits to the local people (poverty alleviation) and accessibility to the project area and other related impacts.

For the Greater Livingstone TAAP, three scenarios were assessed: 1) business as usual, 2) investment in tourism facilities and 3) investment in a road by-pass. Scenario 3 was found to have higher social and economic benefits compared to scenarios 1 and 2, but would result in the highest negative impacts on the environment. In predicting and analysing the outcomes of each scenario, various assumptions were made, including: stable political climate maintained in Zambia, Victoria Falls remains a world heritage site to maintain its attractiveness, and Livingstone remains a preferred tourism destination.

Key outcomes

- As a result of the SEAs, legislation has been enacted in Zambia requiring SEA.
- Development projects in the two areas are now being undertaken in accordance with SEA recommendations.
- All sectoral ministries are now required to develop environmental strategies

Source: Kabwe (2013).

[3.2] SEA when there are no existing underlying policies, plans or programmes

As already indicated, SEA is most helpful when it is fully embedded in the PPP process and particularly when it is applied up-front and can play a critical role in informing the early thinking and development of a policy, plan or programme. For example, in 2009, the Bulgarian Ministry of Economy, Energy and Tourism (MEET) commissioned a consortium of consultants to undertake an SEA (termed a Strategic Environmental Review, SER) of the Wind Power sector. The SER was funded by the Spanish Government through the European Bank for Reconstruction & Development. It assessed both the positive and negative aspects of wind power – including the cumulative effects of wind farm developments, and outlined measures to mitigate the negative aspects to acceptable levels. It also produced a separate best practice guide for the implementation of wind power in Bulgaria. The SER provided a forum for all stakeholders in wind power development in Bulgaria, including the authorities, industry, NGOs and local residents.

The SER was intended to help the MEET to adopt strategies and define clearly the country's windpower needs, taking into account its energy requirements, social conditions and the need for environmental protection. The results of the SER have been used as an input to an SEA of the renewable energy sector, submitted to the EC in June 2010. For the SER report, see http://www.bgwindenergy.com/bgwindenergy/en/doc/Final_SER_Report_ENG.pdf

In Mozambique, coastal zone resources are under increasing pressure, particularly in the north of the country, due to recent hydrocarbon exploration activities. There is no planning for resource use in this zone. The government recognized that the destruction of natural and cultural heritage due to hydrocarbon exploration and a range of other development activities (eg mining, port development, new roads, fisheries and tourism) could increase the potential for conflict. It accepted the urgent need to reconcile rapid economic growth with the maintenance of biological and ecological processes and well-being of coastal communities. Thus, in 2010, with donor funding, the Ministry for the Coordination of Environmental Affairs (MICOA) commissioned consultants to undertake an SEA for the Mozambican Coastal Zone¹⁶. This was the first large-scale SEA ever undertaken in Mozambique and led to the preparation of guidelines and recommendations that are being incorporated in the country's legal framework so that they can effectively influence decision-making processes and be used by sectors in preparing new plans and policies for the coastal zone (Box 9).

[16] In Mozambique, the coastal zone is defined as all the coastal districts (41) distributed along 2700km of coastline (Figure 5), from their inner administrative boundary to 12nm out to sea.

[Box 9] SEA of the coastal zone of Mozambique

The key objectives of the SEA were to:

- Provide a tool to improve land planning for the coastal zone;
- Minimize the potential conflicts between key sectors exploring the coastal resources by providing guidelines for implementing investment projects: mining, oil and gas, tourism, fisheries transportation infrastructures and ports;
- Promote sustainable development of the coastal zone, assuring that new developments take into consideration the livelihoods of coastal communities livelihoods, ecosystems services and biodiversity conservation.

Methodology

The SEA involved desktop baseline studies and institution and legislation review, field work at district level, meetings with key ministries (tourism, transport, fisheries, mineral resources) and stakeholders, and regional workshops.

Following a government directive which focuses on the districts as the unit for development, **environmental profiles** were prepared for each of the 41 coastal districts (Figure 5). These included both a narrative description of the main biophysical and socioeconomic characteristics and maps, and a chapter on opportunities and challenges for the development of each district.

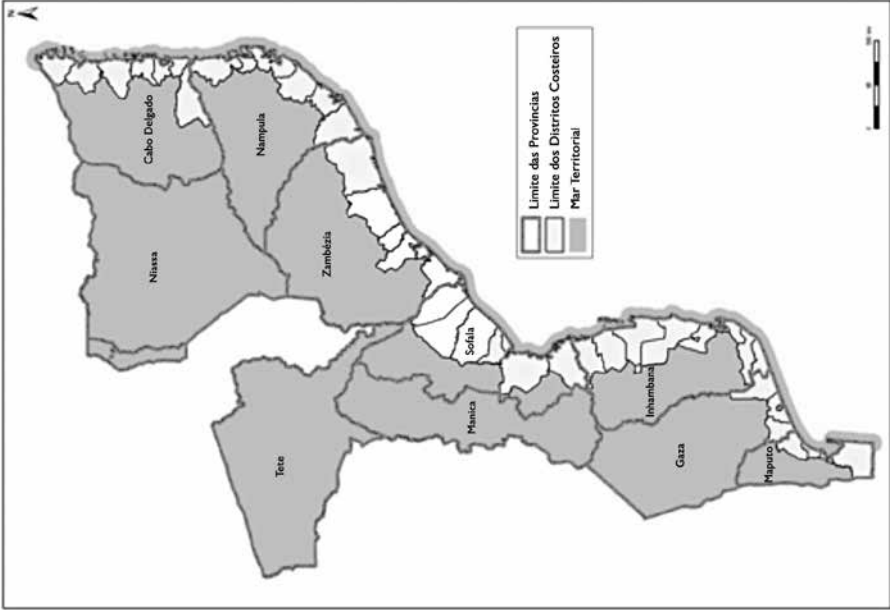
A **coastal diagnosis** highlighted the main key features of the coast and mapped the main activities of the key sectors. Four priority geographic areas of greatest concern were identified – where conflicts between sectors have been detected, big investments and projects are foreseen for the next 5 years, and where biodiversity conservation is a key issue for the sustainability of coastal resources and livelihoods (Palma and Mocimboa da Praia; Zambezi delta; Govuro, Inhassoro and Vilankulo; and Matutuine) (Figure 6). There is a diversity of public institutions, with overlapping mandates in the coastal zone; implementation of legal instruments is weak and monitoring ineffective.

Three **development scenarios** were considered: a) maximum exploitation of coastal resources; b) maximum conservation of coastal resources and c) an intermediate scenario – which was found to present the best option for coastal development.

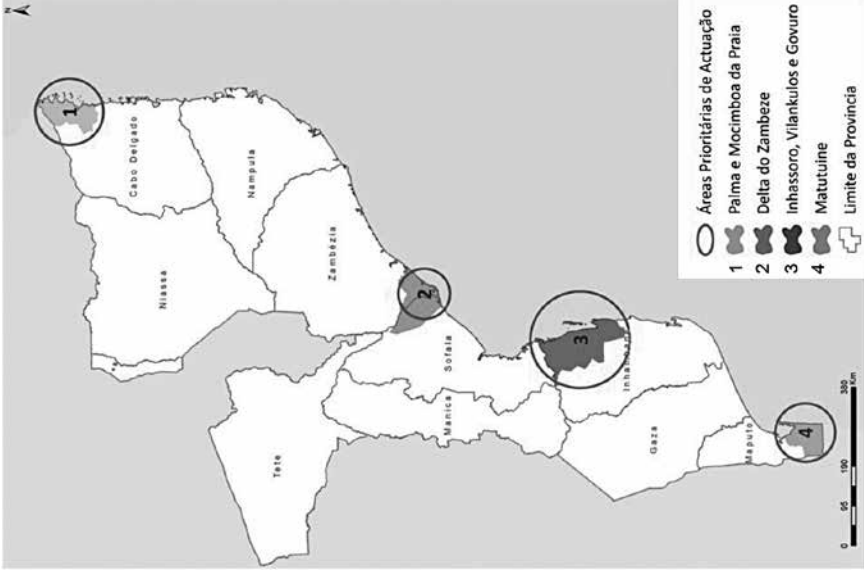
Outcomes

Guidelines were developed to help achieve the preferred intermediate scenario: i) institutional and legal guidelines; and ii) planning and management guidelines. A monitoring and evaluation plan will be drafted to help in their implementation. Specific sector recommendations were also prepared (hydrocarbon, mining, ports and transport, tourism, fishing, and nature conservation).

[Figure 5] Coastal zone districts, Mozambique



[Figure 6] Priority areas for addressing conflicts between sectors, investment and conservation



Preliminary results

The preliminary report was well received by the key ministries amongst which there was consensus on the value of SEA for planning. Legal experts will determine the format for incorporating the guidelines and recommendations in the legal framework so that they can effectively influence decision-making processes and be used by sectors in preparing new plans and policies.

[3.3] SEA, climate change and low-carbon growth

Responding to the challenges of climate change is a key element of the drive towards a green economy, particularly through investment in low-carbon energy, infrastructure and transport. SEA can play a key role in ensuring that such investments maximize environmental benefits and avoid negative impacts.

Various countries have taken steps to plot how they can meet commitments to cut greenhouse gas emissions, and SEA is being used to assess particular strategies and plans. For example, the UK *Low Carbon Transition Plan* plots how the UK will meet the 34% cut in emissions on 1990 levels by 2020 (see http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/lc_trans_plan/lc_trans_plan.aspx). It shows how reductions in the power sector and heavy industry; transport; homes and communities; workplaces and jobs; and farming, land and waste sectors could enable carbon budgets to 2022 to be met. The Plan is an overarching document and a number of more detailed documents were published alongside it, including *Low Carbon Transport – a Greener Future* (Department for Transport), the UK *Low Carbon Industrial Strategy* (Department of Business, Industry and Skills, and Department of Environment and Climate Change, DECC) and the UK *Renewable Energy Strategy* (DECC). Related to the latter strategy, DECC completed a Strategic Environmental Assessment (SEA) on UK offshore energy in 2009. The UK's devolved governments are also undertaking SEAs with regard to low-carbon development proposals. In 2010, the Scottish Government commissioned an SEA of proposals for reducing greenhouse gas emissions to meet Scotland's ambitious statutory targets – covering energy efficiency, energy generation, land use and transport – as well as waste. The proposals were contained in the Climate Change (Scotland) Act 2009 Report on Proposals and Policies ('the RPP'). The SEA concluded that the proposals were unlikely to have any significant adverse environmental effects (see <http://www.scotland.gov.uk/Publications/2010/11/18140057/0>). The Welsh Government has supported an SEA to assess the significant environmental effects of the proposed Severn Estuary tidal schemes. And, in the UK, many statutory SEAs of local development plans now address climate change and low carbon development proposals, eg Barking Town Centre Low Carbon Zone - Environmental improvement scheme linked to Barking's designation as a Low Carbon Zone (see <http://www.barking-dagenham.gov.uk/8-leisure-envir/planning/local-implementation/pdf/lip2-doc1.pdf>).

There are relatively few available cases of completed SEAs that address climate change in a developing country context. An exception is a new SEA, currently in the scoping stage, of the Benguela Current Large Marine Ecosystem (covering South Africa, Namibia and Angola) where climate change is a key concern (Box 10).

[Box 10] The Benguela Current Large Marine Ecosystem SEA

The cold waters of the Benguela current flow northwards up the west coast of southern Africa (Figure 7). The Benguela Current Large Marine Ecosystem (BCLME) includes South Africa, Namibia and Angola. The vision of the Benguela Current Commission for the BCLME is "an ecosystem that is sustainably used and managed, conserved, protected and contributes to the wellbeing of the people of the region"

Many project-level EIAs have been conducted for large and small projects in all three countries. Since most were done in isolation of each other, the cumulative impacts of many projects being implemented at the same time or in sequence, are not known. To address this issue, the Commission has initiated an SEA, currently in the scoping phase.

There seems to be general consensus that all current threats (external and internal) to the BCLME are likely to increase in the future.

[illegible]

- Climate change (influencing intertidal and marine life, environmental variability, sea-levels and sea surface temperature);
- Land degradation and deteriorating ecological functioning in catchments which support rivers that drain into the ocean (particularly the Orange-Vaal, Kunene, Cuanza and Congo);
- Marine pollution from shipping.

- Onshore, offshore and deep-sea mining activities together with inadequate fisheries management;
- Marine pollution – growing in complexity and intensity – is linked to all sectors (but particularly industrial activity, oil and gas exploration and production, shipping, seawater desalination and urban expansion);

- Inappropriate and/or poorly planned/managed coastal developments, which alter coastal structures and processes and place escalating pressure on intertidal resources, freshwater, terrestrial biodiversity and air quality;
- The introduction and spread of alien invasive species;
- Inappropriate recreational activities (including angling, off road driving and cetacean watching boat trips).

The Terms of Reference for this SEA Scoping study highlight a need to:

- prevent, reduce and control degradation of the marine environment so as to maintain and improve its life-support and productive capacities;
- develop and increase the potential of marine living resources to meet human nutritional needs as well as social, economic and development goals; and
- promote the integrated management and sustainable development of coastal areas and the marine environment.

To achieve the above, the SEA should provide an understanding of the cumulative impacts of current and likely future developments, against a backdrop of regulatory, institutional and decision-making processes. The SEA's Strategic Environmental Management Plan is expected to include a scientifically based strategy to monitor and assess the changing states and health of the ecosystems by tracking key biological and environmental parameters, and alerting decision-makers on the need for management actions.

It is expected that the scoping phase will be concluded in early 2013, and that the Benguela Current Commission will thereafter look for the resources to initiate the full SEA.

Climate change in the BCLME

As a major reservoir and transporter of heat in the climate system, the ocean and its interactions with the atmosphere are at the root of the high climate variability experienced within the BCLME. They drive the El Niño-Southern Oscillation and other naturally occurring climate phenomena which can have significant impacts on marine ecosystems and fisheries. The naturally high environmental variability of the BCLME complicates understanding of the many potential impacts of climate change on the ecosystem but, in general, the following changes are expected:

- Increasing sea surface temperature (SST) with associated changes to coastal wind regimes (this will affect biodiversity and ecosystem form and functioning);
- Continued sea level rise (SLR);
- Increased variability within the BCLME.

The areas most susceptible to SLR are heavily populated deltas/estuaries and the offshore islands important for bird breeding. A range of coastal responses can be expected as a result of SLR: increasing rates of coastal erosion; increased flooding, inundation and displacement of wetlands and lowlands; impairment of water quality in freshwater aquifers and estuaries due to increased salt intrusion; and reduced protection from extreme storm and flood events.

The SEA will overlay the expected impacts of climate change on the likely (and better understood) impacts of various sector developments, in an attempt to obtain a clear picture of cumulative impacts.

Source: Peter Tarr; SAIEA, pers.com.

The OECD DAC SEA Task Team has published an Advisory Note setting out how SEA can address adaptation to climate change in the context of development cooperation (OECD DAC 2010a). This has been used to good effect to guide the design of an analytical framework for an SEA undertaken by VerdeAzul Consult Lda., contracted by the Mozambican National Institute for Disaster Management (INGC) to implement a pilot project “*Resilience Building through the Engagement of the Private Sector*”. This project focuses on the identification and implementation of adaptation measures and the strengthening of national capacity to deal with climate change. Eight priority themes were identified for Phase II, which include more detailed studies on (1) early warning and preparedness, (2) coastal zones, (3) preparing cities, (4) private sector engagement in adaptation to climate change, (5) water, (6) meeting food demands, (7) preparing people and (8) extremes. The objective of Theme 4 is to ensure the start of implementation of adaptation and resilience building (with emphasis on disaster risk reduction), by engaging the private sector in a structured and effective manner. For this purpose, a 2.4 million ha pilot geographical area in Cabo Delgado Province has been chosen, attractive to private investors. It covers six districts and includes coastal areas, land suitable for agriculture, forests and conservation areas offering investment opportunities mainly in agriculture, forestry and tourism. Pemba, the provincial capital, has a harbour and port, an important aspect for private investors.

The SEA aimed to assess private investment options for the pilot geographical area under three climate change scenarios (based on predictions and climate impact statements made in the first phase of the project) and to develop a framework for strategic assessment of private investment options following a pathway that will increase resilience to climate change. The analytical framework was used to generate information on vulnerability to selected critical issues (eg impact of climate on local community livelihoods) that underpin decision-making under the three climate scenarios. This assessment then provided the basis for identifying risks and opportunities for the three investment options that were identified to be most relevant to the study area (tourism, agriculture and forestry). The team is now working on a concrete adaptation and investment plan for the pilot area (Rita Cammaer, VerdeAzul Consult Lda, pers.com).

Orissa was the first Indian state to produce a climate change action plan (CCAP) in 2010 – a blueprint to reduce climate change risk for the next five years. The process took six months and was kick-started using an SEA – extended to cover the low-carbon agenda (Hedger and Sharma, 2010) – to assess the broad range of issues, risks and opportunities that contribute to the integration or mainstreaming of climate change considerations in the state’s development planning. The SEA was followed by discussion on potential action by 11 working groups drawn mostly from state government departments, initial discussions with NGOs and five sub-regional stakeholder consultations.

One key GE-orientated international initiative is Reducing Emissions from Deforestation and Forest Degradation (REDD) – an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. REDD+ goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. REDD is also seen as delivering ‘co-benefits’ such as biodiversity conservation and poverty alleviation. REDD is being pushed strongly by the World Bank and UN as a means to set up the bases for the carbon market and the legal and governance frameworks of countries receiving REDD payments. Activities can be undertaken by national or local governments, NGOs, the private sector, or any combination of these. REDD/REDD+ activities framed through PPPs will be made more effective and more sustainable by being developed and implemented in conjunction with SEA processes.

[3.3.1] SEA and Climate Funds

Two Climate Investment Funds (CIF) were set up in 2008: the Clean Technology Fund (CTF), financing scaled-up demonstration, deployment and transfer of low-carbon technologies for significant greenhouse gas reductions within country investment plans; and the Strategic Climate Fund (SCF), financing targeted programmes in developing countries to pilot new climate or sectoral approaches with scaling-up potential. The funds are channelled through the Multilateral Development Banks (MDBs).

A Strategic Environmental and Social Assessment (SESA) was commissioned in 2010 and conducted mainly by World Bank and MDB staff to provide targeted information to the Trust Fund Committee and sub-committee members to decision-making on CIF processes. Its purpose was to ensure that positive environmental and social effects are being fully enhanced and that any potential negative effects are being monitored and managed appropriately. The SEA focused in particular at the programming stage, as well as on the monitoring and evaluation stage in each of the CIF programmes. Each CIF programme was at a different level of development, so the SEA aimed to provide information specifically to those key decision-making points over the subsequent six months (see http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/SEA%20of%20the%20CIFs_Final%20TOR_May%2026.pdf). The SESA report is not yet available.

[3.4] SEA and sustainable transport

OECD guidelines on environmentally sustainable transport highlight that the

“Continued growth in the number of motorised vehicles and their use places major burdens on the availability of natural resources, notably oil. Emissions from the burning of motor vehicle fuel contribute to global and local damage to ecosystems and human health. Other concerns related to the use of motorised transport include traffic accidents, high noise levels that harm human health, and land use patterns that interfere with habitat, migration patterns, and ecosystem integrity” (OECD 2002).

Responding to this problem, there are now many examples of initiatives to develop sustainable transport strategies and systems. For example, in the UK, many local authorities have developed sustainable transport strategies and plans that have been subjected, by law, to SEA, eg the London borough of Islington's 2006-2016 Sustainable Transport (see <http://www.islington.gov.uk/transport/sustainabletransportstrategy/>).

In practice, along with land use planning, transport is one of the sectors for which there is the most SEA experience (Fischer, 2002). Ghana provides a good example from the developing world where, in 2007, the Environmental Protection Agency in collaboration with the Ministry of Transportation conducted a participatory SEA of the transport sector, focusing on the draft Transport Policy. Its aim (Ghana EPA 2007) was to:

- Develop a tool to mainstream environment into transport planning, linking transport planning to air quality, noise nuisance and climate change; and
- Identify and develop appropriate policies, regulatory and institutional mechanisms and capacities required to ensure sound and sustainable environmental management practices within the transport sector and the integration of these mechanisms into current and future transport policies, plans and programmes in Ghana.

Many transport-focused SEAs have also been carried out with the support of development cooperation agencies (Box 11).

[Box 11] Transport sector SEAs in development cooperation; some examples

The OECD DAC SEA Task Team's regular survey of SEA activities in development cooperation show a range of SEAs being undertaken in the transport sector; eg (dates indicate when completed):

- Ghana – Transport Integration Plan (EC) (2009)
- India – support to city of Pune (focus on urban transport) (Sida) (2010)
- Mali – Transport Sector Budget Support (EC) (2010)
- Yemen – Socotra Roads Development Plan (Dutch support) (started 2010)
- Zambia – Road Sector Investment Programme (EC) (planned)
- Zambia – Western Corridor Road Infrastructure Programme (Danida) (2008)

The World Bank also reports a number of SEAs under preparation in developing countries in the transport sector, ranging from railway planning, road network plans, and urban transport planning (<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFIC/EXT/EXTAPREGTOPENVIRONMENT/0,,contentMDK:20438708~menuPK:502915~pagePK:34004173~piPK:34003707~theSitePK:502886,00.html>).

Examples include the following in China:

- *SEA scoping study on China's railway sector* – has helped the China Ministry of Railways to improve its understanding of SEA and be better prepared for planning its investment programmes;
- *SEA for urban and transport planning in Guiyang City* – in support of the implementation of the World Bank Guiyang Transport Project;
- *SEA of provincial road network plan (2002-2020) in Hubei Province* – to assess significant environmental and social impacts of the transport plan, identify and recommend mitigation measures and institutional adjustments needed to address these impacts, and assist the provincial government to strengthen its environmental assessment capacity in road network planning.

[3.5] SEA applied to waste management, water and sanitation

Waste management has evolved from the simple transportation of waste to landfills to complex systems, including waste prevention and waste recycling as well as several waste treatment and landfill technologies. SEA can be applied to assess the environmental, economical and social effects of waste management systems. In the UK, there are many examples of SEAs applied to local and municipal waste management plans and strategies. For example, the Cheshire Consolidated Joint Municipal Waste Management Strategy was subjected to SEA in 2007 (as required under the Environmental Assessment of Plans and Programmes Regulations 2004). It concluded that the impacts of the headline strategy were generally positive since key proposed activities related to reducing the amount of waste produced and increasing recycling and composting in order to minimise the amount of waste going to landfill. Potential negative impacts related to the increased cost of waste management and the impacts that arise through the additional transportation of waste. Expenditure on collection and processing systems were predicted to increase in the short term, but, in the long term, the costs of new infrastructure would be less than the cost of continuing to send waste to landfill. Transport impacts may impact on local air quality which also has a potential impact on human health (see http://www.cheshirewestandchester.gov.uk/waste_and_recycling/waste_strategy.aspx).

Vienna recycles about 34% of municipal waste, 63% is treated in waste-to-energy plants and only 3% (demolition waste, etc) is landfilled. Vienna's three waste-to-energy (WTE) plants provide district heating to 144,000 Viennese households and electricity to another 44,000. The primary objective of Vienna's Waste Management Department is to operate all plants and equipment in an economically and ecologically sustainable way. Equal emphasis is placed on environmental, social and economic aspects in the City's long-term waste management plan (WMP). Key strategic aims

include keeping waste transportation to a minimum, communication and public education, and using the best available technologies for waste treatment. An SEA is carried out at least every five years to update the WMP, with numerous experts, NGOs and the public involved in the process (Arbter, 2005). A monitoring team including representatives of the waste management authorities, environmental authorities and NGOs, prepares an annual report which is sent to the SEA team and Vienna City Environmental Department which makes adjustments to the plan (Barth and Fuder, 2002).

As yet, there are few available examples of SEAs applied to such waste management plans and strategies in developing countries, although waste management issues are routinely addressed in SEAs in a wide range of contexts, eg infrastructure development, tourism, city plans. But SEA applied to water and sanitation plans is more common. For example, in Ghana, SEA has been applied to the process of developing a new National Water Policy and to the 1999 Environmental Sanitation Policy (Salifu and Darko-Mensah, 2008). The latter resulted in revisions to specific sections.

More recently, the Government of Azerbaijan has received financing from the IBRD¹⁷ toward the cost of developing the Greater Baku Regional Development Plan (GBRDP) under the National Water Supply and Sanitation Project. Linked to this, in December 2010, it invited consultants to bid to undertake an SEA of this Plan – with the objectives to:

“(i) incorporate environmental considerations and assess the likely significant environmental effects (risks, cumulative long-term impacts and opportunities) of the implementation of the GBRDP; (ii) recommend policies, institutional and governance arrangements conditioned on the premise of sustainable urban development of Greater Baku's urban development; (iii) provide overall direction and inputs to the GBRDP formulation (including LED strategy and action plan) and other sectoral projects and plans (e.g., conceptual land use plans/structure plans for Alat and Dubendi); and (iv) ensure stakeholders and wider public participation in the dialogue on the urban development planning through a series of consultations”.

(<http://www.devex.com/fr/projects/national-water-supply-and-sanitation-project-in-azerbaijan-consulting-services-for-the-strategic-environmental-assessment-sea-of-the-greater-baku-regi>)

[3.6] SEA, ecosystems and sustainable use of biodiversity

Ecosystems directly support many livelihoods and provide essential goods and services to millions of people, but they are also increasingly under threat from human activity as demonstrated by the Millennium Ecosystem Assessment (MEA 2005). To sustain biodiversity as the basis of essential ecosystem services will require improved planning and management of human activity and the value of biodiversity and its benefits to be better understood¹⁸. SEA can play an important role to ensure that the conservation and sustainable use of biodiversity is factored into strategic decision-making and is not seen merely as a specialist topic. Indeed, all 'good practice' SEAs address ecosystem and biodiversity concerns as a matter of routine – as demonstrated in Box 12).

[17] The International Bank for Reconstruction and Development – the original institution of the World Bank Group.

[18] GIZ and others are providing training and have developed a manual on integrating biodiversity/e-services into development planning (Kosmus et al., 2012)

[Box 12] Regional environmental assessment of Argentina flood protection

A regional environment assessment (REA) – a form of SEA – was undertaken for an investment programme to protect communities occupying the flood plains of the Paraguay, Parana and Uruguay rivers in northern Argentina. This region had suffered enormous losses from periodic flooding. But the periodic flooding also has important ecological functions and sustains ecological systems and many forms of productive activities. So the project adopted a “living with floods” strategy. Proposed construction works included flood defences in areas of economic importance and with greatest vulnerability to repeated flooding. Non-structural measures included: strengthening institutional capacity and coordination to deal with periodic flooding; upgrading flood warning, preparedness and shelter in areas not warranting structural defences; and capacity-building and technical assistance to support these activities.

The REA was initiated at an early stage of the decision-making process and included:

- description of the interaction of hydro-ecological and socio-economic systems of the region;
- screening of potential investments to select sub-projects with clear economic, social and environmental benefits;
- analysis of alternatives for each site using criteria of least possible interference with natural flooding patterns;
- analysis of the cumulative effects of all flood protection projects;
- public consultation aimed at improving the design of all sub-projects;
- design changes to take into account the results of the REA and public consultation;
- identification of mitigation and monitoring measures;
- identification of institutional weaknesses in dealing with the flood problem; and
- recommendation for a regional action plan to address the issues identified.

The REA studied the interactions of natural and man-made systems within the floodplains. These included the ecological functions of the periodic floods and the current state of critical ecosystems such as wetlands and gallery forests. The study found that, to a surprising extent, many ecosystems and human activities depended on the floods. This had a direct impact on the way the project was designed. Criteria for the selection of investments were modified to ensure that flooding would continue, but not threaten human well-being and economic infrastructure.

The study documented the extent to which wetlands, gallery forests and aquatic ecosystems of the tributaries to the three rivers are threatened by human activities. It found that the most disruptive activities were road construction, followed by poorly planned urban expansion and effluent from the meat packing industry. Poor urban sanitation services were directly undermining existing flood protection works. For example, many communities disposed of garbage along protective dykes. This attracted rodents which weakened the dykes by digging tunnels, making them ineffective against floods.

The REA assisted the design of four key project components to help improve the environmental and economic benefits of the project:

- (i) strengthening EA procedures in key institutions within the seven provinces;
- (ii) technical assistance for urban environmental management;
- (iii) environmental education and awareness programmes in communities benefiting from protection works; and
- (iv) support to protection and management initiatives for wetlands and other ecosystems.

Perhaps the most important outcome of the REA was its direct contribution to screening all potential investments under the project. It helped reduce the number of possible sub-projects from 150 to 51, all with a clear economic, social and environmental justification. Once these sub-projects had been selected, the REA team prepared project-specific EAs for each one. When they were completed, the REA team returned to examine the likely cumulative impacts of all the 51 sub-projects, to ensure that such impacts would be minimised.

Source: World Bank (1996), Kjærven and Lindjhem (2002).

There is increasing international commitment to link SEA and biodiversity conservation. For example, the Convention on Biological Diversity, the Ramsar Convention on wetlands and the Convention for Migratory Species all identify SEA as an important tool to help ensure that development is planned and implemented for the benefit of biodiversity. In April 2010, the OECD Development Assistance Committee issued a policy statement¹⁹ on integrating biodiversity and associated ecosystem services into development cooperation. This commits OECD members, *inter alia*, to support partner countries to:

- Integrate biodiversity and ecosystem services into development policies, sector plans and budget processes, and address coherence and synergies with other policy goals, including the MDGs;
- Improve decision-making related to ecosystem management through the systematic use of environmental assessment tools, such as strategic environmental assessment (SEA), cumulative impact assessment (CIA) and environmental impact assessment (EIA)

The text of this second bullet was reiterated in the Nagoya Declaration on Biodiversity in Development Cooperation issued on 26 October 2010 by development cooperation policy institutions and agencies and partners at the 10th meeting of the Conference of the Parties to the Convention on Biological Diversity in Nagoya, Japan²⁰.

Treweek *et al.* (2005) suggest three important principles that should be taken into account to ensure that biodiversity considerations are appropriately addressed in the SEA process:

- *No net loss* – the status quo should be maintained in terms of quantitative and qualitative aspects of biodiversity (what there is, how abundant it is, how it is structured and distributed). This principle has been adopted by the mining industry – see IIED/WBCSD (2002).
- *Precautionary principle* – proponents of potentially environmentally damaging practices must demonstrate that their proposed activities are in fact safe or acceptable before they can go ahead. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
- *SEA should consider biodiversity impacts at an appropriate level*, eg genetic, species, ecosystem. To assess impacts at the gene-level it may be necessary to identify key ecosystem changes first or to consider risks at a landscape scale: many threats to genetic diversity – e.g. isolation of species populations – operate at the ecosystem, landscape or global scale.

Drawing from international experience, Treweek *et al.* (2011) discuss how SEA can be an effective tool for the conservation and sustainable use of biodiversity in developing countries by providing opportunities to:

- build biodiversity objectives into land-use, urban or sectoral PPPs at international, national, provincial (county or state) or local level;
- identify biodiversity-friendly alternatives that are compatible with sustained delivery of ecosystem services;
- identify and manage cumulative threats that might appear insignificant if addressed in isolation;
- plan effective mitigation strategies to ensure that biodiversity and ecosystem services are sustained;
- put in place monitoring programmes to provide necessary biodiversity information;
- strengthen biodiversity partnerships and information networks;
- create an opportunity for biodiversity specialists to engage with planners and decision-makers;
- create opportunities for people who need and use biodiversity to influence strategic decisions that might affect their biodiversity resources and access to them (eg Box 13);

[19] http://www.equatorinitiative.org/images/stories/ep2010/Prize_Ceremony/FlashDrive/oecd-%20dac-%20policy%20statement.pdf

[20] <https://69.90.183.227/doc/meetings/development/hlfbdc-01/official/hlfbdc-01-declaration-en.pdf>

- integrate biodiversity into a range of activities that effect the way environmental resources are dealt with, including agriculture, agro-forestry and minerals from central government level downwards.

Many of these suggestions offered by Treweek *et al.* will be addressed in an SEA programme currently being planned in Nepal to help review and revise the Protected Areas Policy. This three-year programme to support the Ministry of National Parks and Wildlife Conservation aims to undertake SEA studies in all the national parks and conservation areas. It will look back over more than 20 years of managing protected areas under different regimes (comparing top-down government management in some protected areas, with community-based participatory management by NGOs and community organisations introduced in conservation areas); and look forward at new and emerging trends (eg climate change) and how these might influence management approaches.

Guidance to help ensure that biodiversity considerations are appropriately addressed in SEAs has also been developed by the Countryside Council for Wales, English Nature, Environment Agency and Royal Society for the Protection of Birds (2004). This explains step-by-step how biodiversity implications can be considered at each stage in SEA. It examines links between SEA and other procedures such as sustainability appraisal, and provides a 'toolkit' of more specific techniques for promoting biodiversity through SEA.

[Box 13] SEA of the India Eco-Development Project

This SEA was a catalyst for new thinking about the benefits of biodiversity and access to biodiversity resources so that impacts on protected areas could be better managed. The most significant threats common to all of the protected areas were identified to be exerted by indigenous communities living in and around them: fuel extraction, fodder, timber and non-wood products, grazing of livestock and encroachment for cultivation and public thoroughfares.

The SEA aimed to strengthen biodiversity conservation through community involvement, with the support of and collaboration among implementing agencies, protected area authorities, various stakeholders and donors. It provided guidance on options for improved protected area management and effective strategies for maximizing the intended conservation and community benefits. In this way, it acted as a 'sounding board' to prevent or mitigate significant potential impacts where possible, and facilitate continuous improvement in overall project performance.

The involvement of local communities was the key factor, especially during the design and planning of the SEA process. This allowed the value of ecosystem services to be clarified and alternatives to be developed to ensure these values would be sustained. It gave the communities a sense of 'ownership' of key eco-development activities.

Source: Rajvanashi (2005).

[3.7] SEA and sustainable agriculture/food production and supply

There is no universally agreed definition of sustainable agriculture. But it is generally accepted that it uses ecological principles to underpin an integrated system of plant and animal production practices and embraces three key goals – environmental health, economic profitability, and social and economic equity – as illustrated by the similar definitions adopted by the UK Department of Environment, Food and Rural Affairs and the United States Sustainable Agriculture Network (Table 2).

The ecosystem and environmental dimensions in these example definitions are key factors that an SEA relating to agriculture or food production would take into account. For example, a range of potential negative and positive environmental impacts were identified by an SEA of a proposed CIDA-funded sustainable livelihoods and agriculture programme in Mozambique (Box 14).

[Table 2] Two comparable definitions of sustainable agriculture

UK DEFRA	US Sustainable Agriculture Network
<ul style="list-style-type: none"> ■ Ensuring the continuing availability to the consumer of adequate supplies of, wholesome, varied and reasonably priced food, produced within accordance with generally accepted environmental and social standards; ■ Maintaining a flexible and competitive industry which contributes to an economically viable rural society; ■ Ensuring effective protection of the environment and prudent use of natural resources; ■ Conserving and enhancing the landscape, wildlife, cultural and archaeological value of agricultural land; ■ Respecting a high level of animal welfare. 	<ul style="list-style-type: none"> ■ Achieves the integration of natural biological cycles and controls; ■ Protects and renews soil fertility and the natural resource base; ■ Optimises the management and use of on-farm resources; ■ Reduces the use of non-renewable resources and purchased production inputs; ■ Provides an adequate and dependable farm income; ■ Promotes opportunity in family farming and farm communities; ■ Minimizes adverse impacts on health, safety, wildlife, water quality and the environment.

[Box 14] SEA of proposed Sustainable Livelihoods and Agriculture Programme in Mozambique

In compliance with the Cabinet Directive on the Environmental Assessment of Policy, Plan and Programme Proposals, in 2007, CIDA conducted a detailed SEA for this proposal. It determined that proposed activities were likely to cause direct or evident environmental impacts and/or issues that should be addressed.

The negative environmental effects included giving the recipients the capability to afford quantities of environmentally harmful agricultural chemicals and irrigation equipment, and introducing recipients to technologies or methods of working which were very advantageous economically or socially but which could impact negatively on the environment. Another concern was that the communities would resist new ideas or changing their familiar way of life.

Various mitigation measures were proposed: increasing capacity-building for risk analysis so that communities could make informed decisions; providing training on the negative impacts of current farming practices and the positive impacts of potential farming practices; and ensuring that exchanges and research are balanced, and that all implications of new ideas and technologies are investigated and debated.

A number of activities resulting from the project would likely have positive effects on the environment, eg increased ability of farmers to better manage natural resources; extensive adoption of sustainable practices; promotion of sustainable agriculture techniques; raising of awareness of unsustainable livelihoods practices, crop diversification and rotation; maintenance of native coastal margins; reduction in uncontrolled burning off, and introduction or development of ideas and technologies.

Source: CIDA (see <http://www.acdi-cida.gc.ca/acdi-cida/acdi-cida.nsf/eng/ANN-121815556-RKS>)

An example of SEA applied to particular crops is provided by the UN Food and Agriculture Organisation (FAO) and the International Fund for Agricultural Development (IFAD) in respect of cassava. The continuous increase in the supply and demand of cassava in developing countries has accentuated the negative impact that cassava production and processing has had on the environment and biodiversity. Cassava is mostly produced by small-scale farmers on marginal soils and fragile environments in Africa, Asia and, Latin America and the Caribbean, where

animal manure and chemical fertilizers are not commonly applied to the crop. Expanded cassava production has resulted in deforestation, annual burning of indigenous vegetation, replaced fallow land or shortened fallow period. These factors have, in turn, contributed to soil erosion, depletion of soil nutrient supply, and loss of biodiversity. The large-scale expansion of cassava processing has created improperly stored waste in the form of peels or fibrous by-products, which cause a very unpleasant odour, and depleted the water resources. In view of the above, a Global Cassava Strategy was developed to balance the need for food and fodder while maintaining a healthy environment for future generations. As part of the effort to develop this strategy, an SEA was undertaken to analyse the effects of smallholder cassava production and processing on the environment and biodiversity (Howeler *et al.*, 2001) (Box 15).

[Box 15] Conclusions of SEA of cassava production and processing

"Cassava production can have some negative effect on soil fertility through crop removal of nutrients, but it is likely to have a more serious and long-lasting effect on the environment as a result of erosion. At current yield levels, soil nutrient depletion by cassava is generally far less than by that of other crops. But due to the low value of cassava products, application of manures and chemical fertilizers may not be economically justified, or farmers may not be able to afford the purchase of fertilizer. Once the nutrient supply in the soil is depleted, this can easily be corrected by application of fertilizers. Cassava production, however, does seem to cause serious erosion when the crop is grown on slopes. Soil degradation due to erosion is not easily corrected. Farmers should be encouraged and materially supported to plant cassava on less steep land, and to use appropriate measures to reduce erosion. With these practices, erosion can be reduced by 50 to 90%.

Cassava production does not seem to have had broad effects on biodiversity, either of other *Manihot* species or of those of other genera. There are, however, localized situations that merit attention, as well as the need for plans to minimize future genetic erosion.

Cassava processing can have negative, mainly site-specific, effects on the environment, by producing unpleasant odours and an unsightly display of waste. However, the long-term and broad-based impact on the environment is generally minimal and can be corrected by proper waste treatment, with technologies which are either presently available or under development".

Source: Howeler *et al.* (2001).

There are numerous environmental assessments related to food production and consumption (eg GMS 1996, Bos and de Wit 1996, de Wit *et al.* 1996, Jones 2002) which suggest that there is also good potential for SEA to be applied to address these issues. In developed countries, the contemporary food system provides consumers with convenience, extensive choice and, in many countries, the year-round availability of fresh produce. But these achievements have associated environmental impacts. While many analyses have considered the energy and material efficiency of various options for food production and packaging, very few studies have investigated the environmental impacts of the transport components of food supply chains. This is surprising, given that the global sourcing of food produce, centralized distribution systems, and shopping by car have become prevalent in recent decades and have contributed to an increase in the distance between producer and consumer or "food miles." An environmental assessment reported by Jones (2002) assessed the environmental performance of the predominant fresh produce supply chains in the UK and investigated claims that localized systems are more environmentally efficient (Box 16).

The concept of development corridors is receiving increasing attention. A prominent recent example is the proposed Southern Agricultural Growth Corridor of Tanzania (SAGCOT)²¹ which envisages private sector-led agricultural development in the southern part of the country

[21] 287,000 km² from Dar-es-salaam, Coast, Morogoro, Iringa, Ruvuma, Mbeya, Rukwa, some parts of Dodoma and Singida.

[Box 16] Environmental Assessment of Food Supply Chains: A Case Study on Dessert Apples

The assessment used transport-related fossil-fuel energy consumption and associated carbon dioxide emissions as the main criteria to compare the environmental efficiency in alternative food supply chains. This showed that transportation is now responsible for a considerable fraction of the total energy consumption in the life cycle of fresh apples, and in most cases exceeds the energy consumed in commercial apple cultivation. By developing local production and marketing systems for fresh products, transport demand can be reduced and many of the environmental impacts associated with existing supply chains can be avoided.

Source: Jones (2002).

to achieve food security. It aims to develop hubs and clusters with geographic concentrations of interconnected companies, service providers and associated institutions. SAGCOT'S ambitious targets for 2030 are:

- 350,000 ha in profitable production;
- 420,000 new employment opportunities throughout the value chain;
- 100,00 commercial smallholder farmers;
- 2 million people permanently lifted out of poverty;
- US\$1,200,000,000 annual value of farming revenue;
- US\$3,200,000,000 mobilised in public and private investment.

A *green growth strategy* is being formulated to ensure the integration of environmental sustainability in the Corridor's development. An SEA has been commissioned to ensure that appropriate mechanisms for risk assessment are in place.

[3.8] SEA and green energy

Much attention is being given to schemes to generate energy from renewable sources, such as wind, solar, plant matter, geothermal, wave power and tidal. They usually also include technologies that improve energy efficiency. Nuclear power is sometimes referred to as sustainable, but this is controversial politically due to concerns about peak uranium, radioactive waste disposal and the risks of disaster due to accident, terrorism, or natural disaster.

An increasing number of countries are focusing on options and opportunities for generating energy from renewable sources, and applying SEA in connection with plans and schemes. The UK provides several examples. The Department of Energy and Climate Change (DECC) initiated an SEA of its draft plan/programme for further licensing/leasing rounds for offshore oil and gas, gas importation and storage, CO₂ transport and storage, offshore wind, wave and tidal technologies in UK waters (see http://www.offshore-sea.org.uk/site/scripts/news_article.php?newsID=42).

The Department of Enterprise, Trade and Investment (DETI) in Northern Ireland has launched a statutory consultation on a draft Onshore Renewable Electricity Action Plan which aims to maximise the amount of renewable electricity generated from onshore renewable sources in order to enhance diversity and security of supply, reduce carbon emissions, contribute to the 40% renewable electricity target by 2020 and beyond and develop business and employment opportunities for Northern Ireland companies. This draft Plan has been the subject of an SEA which has considered the potential effects of such developments on the environment in Northern Ireland. The findings of the SEA are documented in an Environmental Report and Non-Technical Summary. Responses to the consultation were to be submitted by 20 January 2012. A dedicated website (see <http://www.onshorerenewablesni.co.uk/>) allows stakeholders and the public to keep up-to-date with the progress of the SEA and acts as a gateway to SEA reports, mapping and other information of interest.

An SEA was initiated in 2008 as part of the feasibility study for generating tidal power in the River Severn estuary, guided by a stakeholder steering group. The estuary has a 14m tidal range and is important for the conservation of estuarine habitats, fish, birds and physical features. The SEA considered five tidal power alternative options – the product of an initial assessment of a wider range of options and variants, including different modes of operation. It employed desk-based studies, supplemented in some cases by modelling and other more sophisticated analysis. The report (Parson Brinkerhoff Ltd, 2010) identified that all alternatives would have adverse environmental effects (Box 17).

[Box 17] Environmental effects of the Tidal Power alternatives in the River Severn Estuary, UK

“Prior to the application of measures to prevent and reduce effects, all alternative options would change the tidal regime within the enclosed part of the estuary, leading to the permanent submergence of large areas of previously intertidal mud and sandflat. The effects are broadly proportional to the size of each alternative option. Long-term responses over 120-years to the enclosure of the estuary may lead to erosion and additional loss of intertidal area. Large quantities of sediment would be deposited within the enclosure, which for the B4 Shoots Barrage and B5 Beachley Barrage may prove an ongoing issue for the maintenance of navigation. The B3 Cardiff to Weston Barrage may cause small but potentially significant elevated spring tide water levels remote from the Severn Estuary. All alternative options would negatively affect land drainage and flood risk that would need to be managed. In the case of B3 Cardiff to Weston Barrage, this may extend to works needed on the West Wales coast. B3 Cardiff to Weston Barrage and L3d Bridgwater Bay Lagoon would have beneficial effects on flood water levels. The L3d Welsh Grounds Lagoon may affect nearby waste and cooling water discharges.

Under all alternative options, water level changes and sedimentation would lead to the loss of large areas of protected habitat, including intertidal sand and mud. As well as being of conservation importance in their own right, the submergence of these habitats threatens internationally designated sites and important bird populations. Sedimentation within subtidal areas would also affect the conservation interest of the estuary and lead to the loss of designated species. All alternative options risk the loss from the estuary and its tributaries of most migratory fish species, that are internationally protected and some represent the only UK populations. Effects on land drainage pose negative effects for terrestrial ecology.

All alternative options pose risks to the historic environment, visual amenity and landscape and seascape character, some of which is already designated. The nature of the risk depends on the location of the alternative option, rather than solely a function of its size. Far-field water level effects for the B3 Cardiff to Weston Barrage may pose risks of effects on the West Wales and Irish coasts.

All alternative options would use large resource quantities in their construction and, making assumptions about the UK energy mix over a 120-year timeframe, relatively rapidly pay back the carbon used in their construction, operation and decommissioning. Alternative options would displace fossil fuel-derived emissions of carbon, in proportion to their size.

Alternative options would generate employment and some also pose health and quality of life effects to the nearby population during their construction. All alternative options, but notably the B3 Cardiff to Weston Barrage, would have negative effects on navigation and port related employment. All alternative options, and the L2 Welsh Grounds Lagoon especially, risk negative effects on marine aggregate extraction. There would be positive and negative effects for recreation and tourism for all alternative options. The B3 Cardiff to Weston Barrage, B4 Shoots Barrage and B5 Beachley Barrage would result in the loss of a bore that can be surfed.”

Source: Parson Brinkerhoff (2010).

In November 2010, the UK government announced its intention not to bring forward a tidal energy scheme in the Severn estuary at this time, but to keep the option open for future consideration. This decision was based on the evidence gathered by the study, and taking into account the wider climate and energy goals, and consideration of the relative costs, benefits and impacts of a Severn tidal power scheme, as compared to other options for generating low carbon electricity (<http://www.decc.gov.uk/EN/Default.aspx?n1=3&n2=51&n3=58&n4=60&n5=171>).

In 2010, the Scottish Government published a draft Renewables Action Plan (RAP) for Scotland. The draft set out priorities and actions for the development of the Scottish renewable energy sector, to ensure that the broader target of producing 20% of energy from renewable sources by 2020 is met. As the RAP is likely to generate significant environmental effects, under the Environmental Assessment (Scotland) Act 2005, an SEA was required (Box 18).

[Box 18] SEA of Renewables Action Plan (RAP) for Scotland

The RAP focuses primarily on 'how' renewable energy targets should be delivered, as opposed to defining 'what' these targets are, or setting substantive entirely new policy objectives. A key focus for the SEA was a proposed new target for renewable heat in Scotland which has the potential to generate significant environmental challenges and benefits.

Environmental context

A framework for the SEA was provided by the many plans and strategies that set out strategic aims for Scotland's environment:

- International and national targets for climate change mitigation and adaptation. Mitigation focuses on reducing harmful emissions of greenhouse gases, whilst adaptation aims to ensure that long term decision making takes into account the impacts of climate change.
- International commitments to the protection of valued habitats and species, and a growing recognition of value of wider natural heritage resources including strategic ecological networks, as reflected within the National Planning Framework and Scottish Biodiversity Strategy.
- On-going aims of reducing health problems arising from environmental pollution, and promoting higher levels of physical activity, including active transport options.
- International and national commitments to safeguarding soil resources and addressing natural and man-made pressures on soil quality.
- Commitments to safeguarding the water environment, sustaining adequate water supplies and improving water quality. This includes two river basin management plans prepared under the Water Framework Directive, and new legislation on flood risk management.
- Targets for reducing specific air pollutants, particularly those arising from the transport and energy sectors.
- Long-standing policies relating to the protection and enhancement (where appropriate) of the historic environment, including known and unknown archaeology, historic buildings, townscapes and cultural landscapes. This relates to sites and their wider settings.
- Commitments to landscape protection. These traditionally focused on the protection of designated landscapes, but have more recently broadened to reflect the value of wider landscapes, partly as a result of the European Landscape Convention.

Nationally important environmental baseline characteristics were taken into account within the SEA. Several key existing environmental problems could be directly or indirectly influenced by the proposed renewable heat target. In particular, the RAP as whole has the potential to make a major contribution to reducing harmful greenhouse gas emissions and resource use within the energy sector. In addition, whilst Scotland's natural heritage is highly valued, there are on-going challenges including: the decline and poor condition of some habitats; continuing problems with

poor health that are partly attributable to environmental pollution; issues with soil, air and water quality; continuing landscape change resulting in loss of diversity, and pressure on some aspects of the historic environment.

The Scottish Government takes the view that, without the RAP, many of these environmental problems will continue; and without the positive policy emphasis and practical implementation measures provided in the RAP, the energy sector's significant contribution to the climate change agenda is unlikely to be fully realised. At the same time, however, some of the identified environmental pressures arising from a large-scale increase in bioenergy production, could also be avoided without the need for additional mitigation.

Likely significant effects of key elements of the RAP on the environment and proposed mitigation measures

The above environmental issues were used to develop a series of questions, against which the emerging content of the RAP was assessed.

- Initial analysis of the RAP suggested that there was potential for some significant negative effects on the environment. However, following further consideration of available mitigation measures, these effects were not predicted to be significant overall. The assessment showed that the RAP is likely to play a significant role in addressing climate change. However, it also concluded that substantial growth of the bioenergy sector could generate an increase in air pollution, which could be significant in areas where pollution is already concentrated. Monitoring was therefore proposed to identify whether stated targets are being exceeded, particularly within existing and future Air Quality Management Areas (AQMAs). The assessment also noted that, should thresholds for relevant pollutants be breached, mitigation measures will be required to address these effects (the draft RAP already includes a commitment to this). The measures will also ensure that any associated adverse effects on health are avoided.
- Further environmental effects from the production of biomass materials were predicted. This included effects on biodiversity, soils, water, the historic environment and landscapes. These proved difficult to predict with any certainty as they will be dependent on the siting and choice of planting of source materials, harvesting operations and the sustainability of land management techniques. As a result, the SEA recommended that the Scottish Government gives further consideration to developing more detailed guidance on the siting, choice and management of biomass planting that takes into account the range of environmental effects which it could generate.
- Issues around waste management and transport infrastructure were also explored within the SEA. The RAP was expected to make a positive contribution to wider aspirations for sustainable waste management. Effects on transport infrastructure will be minimised, partly as a result of the emphasis within the RAP on sourcing materials close to where they will be consumed.

Monitoring

The SEA identified a number of broad monitoring measures that can be used to track the progress of the RAP and its environmental effects. These included regular evaluation of the contribution made by renewable heat production in Scotland to wider energy targets and further tracking of its environmental effects. This can largely be achieved within existing data collection undertaken by the Scottish Government, and monitoring of air quality by the Scottish Environmental Protection Agency (SEPA) and local authorities. However, it was recommended that, in the longer term, a more comprehensive review of land use change arising from increased levels of biomass production would be useful.

Source: <http://www.scotland.gov.uk/Publications/2009/07/01093638/1>

As part of the rollout of renewable energy in South Africa, the Department of Energy (DoE) has entered into a bidding process for the procurement of 3,725 MW of renewable energy from independent power producers by 2016. In order to submit a bid, a proponent is required to have obtained an Environmental Authorization (EA) under South Africa's EIA Regulations. To date, the National Department of Environmental Affairs (DEA) has received in excess of 400 renewable energy EIA applications and has identified certain inefficiencies in the regulatory and planning process.

In order to address these inefficiencies the DEA has commissioned SEAs for both the wind and solar PV (photovoltaics) energy sectors. Their objectives are to identify geographical areas most suitable for the rollout of wind and solar PV energy projects and upgrade of the supporting electricity grid network. The scoping phases were undertaken in late 2012 (Box 19).

[Box 19] Scope of SEAs for wind and solar PV developments

The SEAs will map regions best suited for the development of wind and solar PV projects, based on resource potential at a national scale (i.e. wind and solar irradiation). For these specific regions, several environmental and social criteria will be overlaid on a GIS platform to highlight the overall level of sensitivity for each zone assessed – with a sensitivity ranking approach and standard buffers around attributes of interest.

Based on the results of the criteria-based assessment, a guideline will stipulate strict requirements to be followed by developers for constructing PV generation plants within the national SEA renewable energy development zones. Each developer will be required to compile an Environmental Management Program (EMPr) including building plans which will be submitted to Authorities for approval. Depending on which issues are flagged while preparing the EMPr, the developer might still be required to commission specialist studies and apply for certain authorizations/permits.

The SEA process, including the development of the site specific guideline document and associated approvals, will be designed to function within the existing legal framework and satisfy all relevant legislation to allow delisting of geographical areas from NEMA listed activities.

Source: Rudolph du Toit, CIS (pers com.)

Box 27 describes an SEA for Mafia island, Tanzania, which examined potentially sustainable and reliable energy options.

[3.8.1] Geothermal energy

The development of geothermal energy is not without potential environmental effects. Albertsson *et al.* (2010) consider these in relation to such projects in Iceland:

“Geothermal exploration usually occurs in pristine areas characterized by volcanic activity, geothermal surface activity and geological formations. Ecosystems, both flora and fauna, are adapted to warm soils. Development includes roads, well pads and drilling of geothermal wells and groundwater and/or sea water wells. There is also deposition of waste soil and drill fluid including drill cuttings and mud. During flow testing of wells, steam and spray has shown to have temporarily adverse effect on the local vegetation with moss and grass being scalded. Noise follows flow testing of wells and can have negative effect on wildlife, tourists and local people.

If results from exploration are positive, development may continue. This can include more roads, well pads, pipelines, power plant, associated buildings and transmission lines. Geothermal power generation usually causes air pollution due to the emission geothermal gas from brine flashing, particularly carbon dioxide (CO₂) and hydrogen sulfide (H₂S), carbon dioxide adding to the greenhouse gas effect and hydrogen sulfide being poisonous in high concentration.

Gas concentration in emissions varies to a great extent from one geothermal site to another. During operation, subsidence and induced seismicity are possible effects, as is change in geothermal surface activity. Discharge of hot water and/or geothermal fluid from geothermal power generation can cause problems whereas the fluid can contain high concentration of various chemicals which may cause threat to living organs".

In Iceland, the Master Plan for Hydro and Geothermal Energy Resources (1999-2010) is akin to an SEA. It compares the economic feasibility and the environmental impact of proposed power development projects to aid the selection of the most feasible projects to develop, it considers their economic and environmental impact, and identifies which rivers or geothermal fields should not be harnessed due to their value as natural heritage and for recreation (see <http://www.nea.is/geothermal/master-plan/>).

[3.8.2] Nuclear energy

As mentioned above, nuclear power is sometimes, controversially, seen as a green or sustainable option. But there have been growing concerns about the security of uranium supplies, which in turn, could see uranium prices rising. In Namibia, this has triggered renewed interest in uranium exploration in Erongo Region – in a national park and popular tourism destination. In 2007, the Namibian government placed a moratorium on further uranium prospecting licences so that it could consider how best to manage the uranium 'rush'. In 2009, it commissioned an SEA to:

- Provide *recommendations* on accepted overall strategic approaches for sustainable mining development in the Erongo Region;
- Develop and assess *viable scenarios* of mining and associated developments as a basis for subsequent decision-making and formal planning;
- Provide *guidance for overall* solutions on crucial (cumulative) impacts and challenges stemming from the mining operations;
- Outline a *Strategic Environmental Management Plan* (SEMP) with a comprehensive set of measures and recommendations to manage and monitor the impacts of the Uranium Rush in Namibia, and to enhance opportunities and mitigate adverse impacts.

The SEA (MME 2010) (Box 20) concluded that whilst the Uranium Rush will present significant opportunities for Namibia in terms of growth and social and economic development, mining under all scenarios will have significant, cumulative, negative impacts on the landscape and biodiversity of the central Namib which will, in turn, affect sense of place, tourism, lives and livelihoods. To realise the benefits of the uranium rush, all tiers of government, the mining companies and civil society (to a lesser extent) will have to overcome some major challenges and constraints. There will also need to be a commitment from all parties to implement all the necessary measures outlined in the SEA and SEMP – which provides a wide range of recommendations to ensure that the positive impacts on sustainability are enhanced and the negative impacts are avoided, reduced, controlled or offset as far as possible.

[3.8.3] Biofuels

As with nuclear power, biofuels are also promoted as a green alternative to conventional fuels. In developing countries, biofuel production and its potential is complex and inherently conflicting. Some parties see mainly the opportunities for improved markets for agricultural produce and rural development coupled with enhancing low-carbon development, whereas others fear competition for land and food production with no real gain – or even loss – for local populations or environment. Even the carbon footprint of biofuel production is variable, depending eg on the chosen production system. Increased net greenhouse gas emissions, e.g. in connection with land use changes and displacement effects' have been documented (FAO 2008; Fargione *et al.*, 2008). Many conclude that there is potential for finding win-win solutions but this will require careful assessment and policy direction, balancing trade-offs between long-term and short-term needs, and between environmental and social needs and economic development objectives. Well-planned biofuel development can contribute to climate change adaptation as well as mitigation.

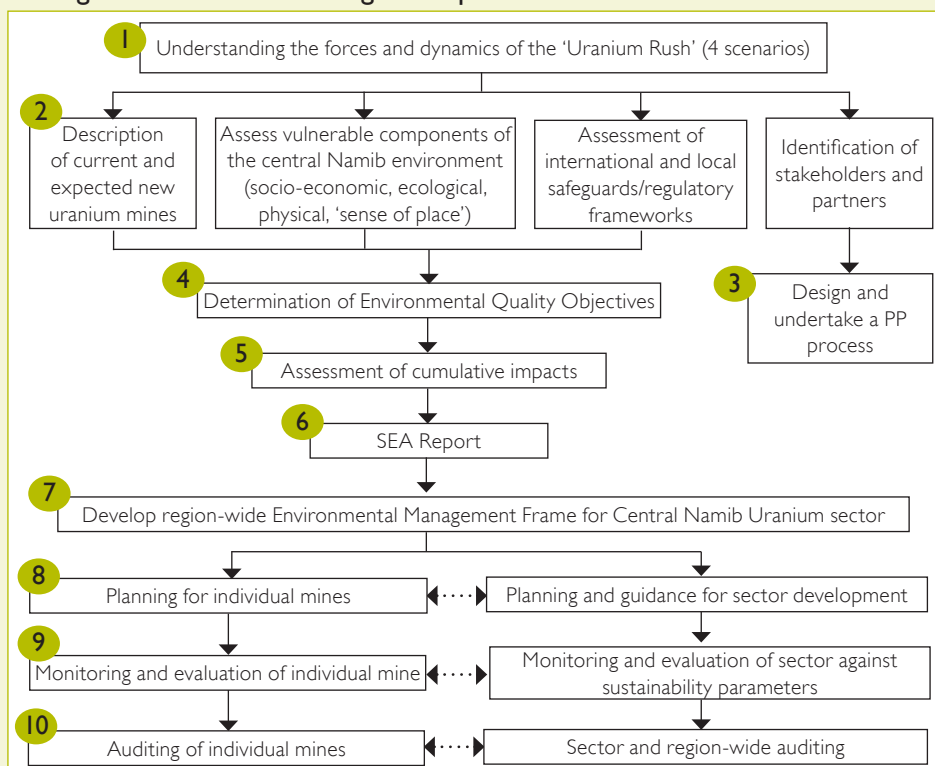
[Box 20] SEA of Uranium Rush in Namibia

With increasing demand for uranium, in recent years, the central part of the Namib desert in Namibia's Erongo Region has seen a scramble for prospecting rights and an increase in mining activity. In response, in 2007, concern about the environmental consequences led the government to place a moratorium on further prospecting licences. This was to ensure that the authorities and other stakeholders could consider how best to manage this uranium 'rush'.

Erongo Region is characterised by aridity, vast desert landscapes, scenic beauty, high biodiversity and endemism and heritage resources. It has the second largest regional economy in Namibia, with fishing, tourism, mining and transportation being the main economic activities, and two important coastal towns: Walvis Bay and Swakopmund. Large parts of the Region's coast are designated as national parks and community conservancies.

The SEA, commissioned in 2009, was very participatory and overseen by a multi-stakeholder Steering Committee and was subjected to independent review. It followed internationally accepted principles of good SEA practice and incorporated standard elements and steps (Figure 8).

[Figure 8] SEA of Central Namib Uranium Rush: Steps and implementing strategic environmental management plan



The SEA characterised the Uranium Rush through four scenarios:

1. 'Below-expectations' (1-4 mines operating by 2020);
2. 'In-line-with-expectations' (5-7 mines operating by 2020);
3. 'Above-expectations' (8-12 mines operating by 2020);
4. 'Boom and bust' (a number of mines first open and then shut down in a hurried, unplanned fashion, without any remedial or stabilisation measures, leaving the mines and all associated infrastructure behind).

The environmental baseline was investigated with additional thematic studies to gather regional-scale data for air quality, human health, radiation levels and groundwater quality and quantity. Analysis revealed a spectrum of potential cumulative impacts covering health, infrastructure, sense of place, water, government revenues, social structures and biodiversity.

The SEA concluded that the Uranium Rush presents significant opportunities for Namibia in terms of growth and development. However, in order to realise these benefits some major challenges and constraints will have to be overcome. This will require political will and financial resources to implement a series of measures outlined in the SEA and SEMP, and the government, mining companies, local authorities and civil society working closely together. But these benefits will come at a price – the Uranium Rush is partly located in a proclaimed national park and one of the most popular tourist hotspots in the country. Unless it is well managed and the necessary safeguards are in place, the Uranium Rush will negatively affect the environment – both at individual mine level and on a cumulative basis, which in turn will affect sense of place, tourism, lives and livelihoods.

Outcomes

Since its completion, the SEA has resulted in several actions:

- Two new uranium mines have used the SEA substantially in the compilation of their EIAs, and have incorporated the main suggestions in the SEMP, into their individual EMPs;
- Strategic service providers to the mines (e.g. power transmission, water supply and road parastatal companies) have pooled their resources to commission an 'integrated EIA' for the development of such infrastructure. As suggested in the SEA, it is expected that this infrastructure will be located in a shared corridor to avoid, where possible, areas identified as important for tourism and conservation (in the past, separate EIAs were undertaken for each mine);
- The government has formalized the SEMP Office and Steering Committee (including all stakeholders that need to input to the SEMP annual report to ensure their commitment and participation);
- Swakopmund compiled a Town EMP, incorporating a number of recommendations made by the SEA;
- As recommended in the SEA, the uranium mining and tourism sectors (the two main economic drivers in the Erongo Region) have begun a formal process of 'developing synergies', to ensure co-existence and mutual support. Key agenda issues are the development of tourism offsets, mining tourism, joint conservation efforts and other ways of reducing opportunity costs.

Source: SAIEA (2010).

An Advisory Note developed by the OECD DAC SEA Task Team makes the case for applying SEA in the context of biofuels (OECD DAC 2011):

"The current relatively low costs of carbon sequestration in the developing world reinforces the likelihood that biofuel will remain a highly attractive sector in low income countries. But biofuel development can have a number of important environmental, social and economical impacts on agriculture-based economies. When negative environmental and social impacts occur in the least developed countries, where populations have least resilience to them, special attention must be paid to power imbalances. The impacts of biofuel production depend on the chosen production system and factors such as which land use is replaced, what feedstock (e.g. jatropha, oil palm or sugar cane) is used, the location, methods and scale of production, as well as who is the end user. For development cooperation, it is important to consider who benefits from biofuel development. SEA provides the opportunity to ensure that the interests of vulnerable and/or marginalised groups (e.g. smallholders, vulnerable social groups, indigenous peoples, subsistence cultures, migrant workers) are considered in the decision-making process. SEA can inform decision-making for more sustainable development by describing different scenarios based on these factors. SEA can provide a means to release tensions between stakeholders by involving them in transparent planning

and implementation, thus also facilitating accountability and good governance. Furthermore, an SEA can help to focus and streamline Environmental Impact Assessments (EIA) for downstream activities, saving time and money.”

Box 21 describes an SEA conducted to assess the potential effects of biofuel production in Colombia.

[Box 21] SEA of Biofuel Development in Colombia

In 2006, Colombia developed preliminary policy guidelines for the energy sector, including biofuel, which identified the need to evaluate the potential effects of promoting biofuels on biodiversity and food security. An SEA was undertaken using an ecosystem approach. Its objectives were to:

- assess the indirect, cumulative and synergistic effects on the Colombian environment and biodiversity that may result from the development of biofuel production; and
- define environmental criteria for the geographical areas where such crops could be promoted and those where such developments should be avoided due to environmental constraints.

Suitable crops were identified (oil palm, sugarcane, panela sugarcane and manioc) based on several criteria such as national policy priorities, interference with different actors in the production chain (traditional economies, agro industry), implications for food security and cultural practices. The SEA also included a comprehensive analysis of planning needs and actions required from different actors to ensure nutritional security, minimize negative impacts on biodiversity, and promote beneficial effects for local populations.

Key points

- Some geographic areas were more suitable to biofuel production, based on, eg water availability, protected areas, family or rural production, national goals for the expansion of cultivated areas, presence of indigenous communities, roads and ports, conflicts related to environmental or land use aspects, forest cover and climate limitations. For example, one project planned to plant 15,000 ha of oil palm trees in areas with drainage restrictions and valuable ecosystems, and soils susceptible to flooding and thus requiring drainage systems to make them suitable for oil palm cultivation. Similarly, such soils would require the use of fertilizers which – because of the region's high rainfall – could impact negatively on aquatic ecosystems.
- The SEA points to successful production systems such as those in the region of Tumaco, where small producers guarantee local diversity by maintaining a balance of 70% oil palm and 30% current production.
- The greatest benefits from biofuel production are concentrated in the intermediary parts of the industrialization chain and amongst large-scale producers. The benefits to the population are generally represented by employment opportunities.
- The unregulated work market (e.g. in general temporary work on seedling and harvesting) needs to change to ensure that work opportunities can effectively enhance the living conditions of rural workers in a more structured and less temporary manner.
- Local expectations have led to higher land prices and conversion of cattle farms to oil palm production. Expectations regarding employment opportunities have attracted new workers from other regions and resulted in new settlements in the region and cultural conflicts.
- There is need to strengthen institutional capacity, environmental and ecosystem management capacity, tools for environmental regulation as well as scientific research on the sustainability of biofuel plans, programmes and projects.

Source: Conpes 2008.

[3.9] SEA and trade

International trade and investment are critical to the prospects for achieving a green economy and sustainable development, particularly in developing countries. For the last fifteen years, this relationship has been the subject of debate and sometimes street demonstrations. Much of the concern has centred on the issue of trade liberalization and its environmental and social impacts, and spurred demands for these effects to be more openly and systematically addressed. Early work, beginning in the 1990s, centred on environmental assessment and review of trade policies and measures. Recently, its scope has been extended to cover the wider linkages among trade, environment and sustainable development, including the effects on social well-being.

The diagnostic approaches applied to analysing these linkages have various names including *integrated assessment* (the term used by UNEP) and *sustainability impact assessment* (SIA – the term preferred by the European Union). These and other approaches all fall under the umbrella of SEA and are discussed in detail in Dalal-Clayton and Sadler (2013, Ch 12, in press). All have the common aim of providing relevant information for negotiators and decision-makers on integrating the relationship between trade initiatives and sustainable development. In doing so, they help to clarify the range of impacts and trade-offs associated with trade liberalization measures and to maximize positive effects and minimize or avoid negative ones (UNEP, 2001; EC, 2003; George and Kirkpatrick, 2003). There has been increasing use of this approach and the development of new tools and methodologies for its conduct.

Such assessments form part of an increasing literature on the relationship of trade, environment and sustainable development (for an overview, see IISD 2003; and for an assessment of effectiveness, see Ekins and Voituriez 2009). Much still remains to be done to understand these linkages, although some of their main dimensions can be readily summarized. First, this relationship is complex, multi-faceted and dynamic, varying across countries and sectors and changing over time (exemplified by the economic rise of China and India). Second, the economic, environmental and social effects of trade liberalization can be positive or negative. Third, there is particular concern about the impact on poorer developing countries with fragile economies and weak governance. Fourth, the impacts of trade policies are difficult to disentangle from domestic-driven changes (particularly in developed economies) and subject to differing interpretations, depending on the assumptions, values and policy frameworks that are brought to bear. The different approaches of the trade and environmental communities can be summarized, respectively, as “policy wholesale” versus “policy retail”, i.e. breaking the effects into analytical pieces such as air or water pollution, etc. (Von Moltke, 2002).

[3.9.1] Fair trade

Fair trade is a trading partnership which aims at sustainable development for excluded and disadvantaged producers. It seeks to do this by providing better trading conditions, by awareness-raising and by campaigning. It does not appear that SEA has yet been applied specifically to fair trade, although it offers obvious potential. But in a paper developed for DFID as part of its development of a Strategy Paper on Fair Trade, Mayoux (2001) discusses experience and limitations of existing impact assessments of fair trade and ethical enterprise development interventions. A range of different frameworks and methodologies have been used including, for example, indicators, participatory, qualitative and quantitative methods, and the sustainable livelihoods framework. She also discusses some of the broader implications for comparative impact assessment of Fair Trade interventions, ethical trade, socially-responsible business development and mainstream private sector interventions.

[4] Indicators and SEA

Indicators should be readily interpretable measures that tell us what is happening with regard to a particular issue. They can be divided roughly into two groups – those that express the state of affairs with regard to the issue, and those which portray trends with specific spatial scales and time horizons. Indicators can also be useful at the organizational level where they can help track and assess performance.

Policies that promote green growth need to be founded on a good understanding of the different factors that affect green growth, and appropriate information is needed to monitor progress and measure results. Monitoring progress towards green growth requires indicators based on internationally comparable data. These need to be embedded in a conceptual framework and selected according to well specified criteria. Ultimately, they need to be capable of sending clear messages which speak to policy-makers and the public at large. Various organisations have addressed this need. For example, as part of its Green Growth Strategy, the OECD has developed a conceptual framework and indicators that help governments monitor progress towards green growth (see: <http://www.oecd.org/greengrowth/greengrowthindicators.htm>), and UNEP has produced a briefing paper on indicators for a green economy (see: http://www.unep.org/greeneconomy/Portals/88/GE_INDICATORS%20final.pdf). It is not the aim of this paper to examine green economy indicators in detail but to explore mainly those that might be employed for SEA purposes.

Identifying appropriate environmental indicators (Box 22) is important in undertaking a SEA, but social and even economic indicators are also likely to be necessary.

[Box 22] Environmental indicators

Since the environment is very complex, indicators provide a more practical and economical way to track the state of the environment than attempting to record every possible environmental variable. For example, the health of amphibian populations is often monitored as they are very sensitive to changes in their habitats and may provide early warning of ecological impacts from climate change, loss of stratospheric ozone, habitat alterations, or the presence of pesticides.

Environmental indicators can include physical, biological and chemical measures (known as ecological indicators), eg atmospheric temperature, the concentration of ozone in the stratosphere, or the number of breeding bird pairs in an area. They can also measure human activities or anthropogenic pressures²², such as greenhouse gas emissions, or the societal responses used to address environmental issues, such as the number of people serviced by sewage treatment.

Environmental indicators are tools that can serve different purposes. They can be used to see if environmental objectives are being met, to communicate the state of the environment to the general public and decision-makers, and as a diagnostic tool through detecting trends in the environment. Indicators are also useful to assess the potential implications of various policy options in the context of scenarios. In addition, there are other, more instrumental applications, eg, using indicators to inform budgeting (ie 'outcome based budgeting', where budget allocations are associated with specific, time-bound targets as measured by indicators).

Environmental indicators can be measured and reported at different scales. For example, a town may track air quality along with water quality and count the number of species of birds whose populations are declining to estimate the health of the environment in the area. Others have attempted to monitor and assess the state of the planet using indicators. In other cases, indicators are developed for specific ecosystems, such as the Great-Lakes in North America.

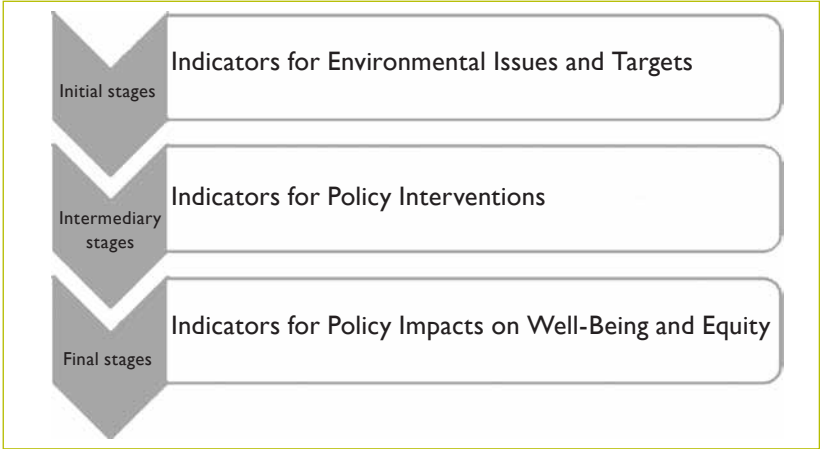
Source: Dalal-Clayton 2009.

[22] These also have their own indicators. It seems the EU's Beyond GDP initiative will return to the earlier idea of pressure indicators and maybe the environmental pressure index.

A key step in SEA, particularly at the 'scoping' stage and in dialogue with stakeholders, is to establish the content of the SEA, decision criteria and suitable 'indicators' to monitor and evaluate desired outcomes (as in the SEA of the Mauritian sugar cane sector; Box 7). A distinction can be made between core indicators that address issues of highest importance for the formal monitoring system, and additional indicators that refer to important considerations which can be addressed through ad-hoc arrangements. In this context, in designing and applying SEA, it will be important to consider the array of indicators that are being identified to track progress in transitioning to a green economy.

In response to the call at Rio+20 for new measures and metrics for a green economy, UNEP (2012) reviews how indicators can be used in developing and tracking green economy policies and in the major stages of policy-making. It suggests a framework for applying indicators (Figure 9) that countries would need to customize according to their contexts and needs.

[Figure 9] Indicators at different stages of green economy policies



UNEP notes that broad environment indicators could cover the areas of climate change, ecosystem management, resource efficiency, and chemicals and waste management, and suggests that leading indicators can be identified within these areas (eg Table 3). Example indicators are also suggested by UNEP for green economy policy interventions, and their impacts on well-being and equity.

The literature and websites of international organisations are awash with environmental, social, economic and sustainable development indicators. Literally hundreds of indicator sets have been created for, and presented to, their respective audiences (from local communities to the UN). Of those focusing on sustainability, most are presented as large, cumbersome reports, full of complex charts and graphs. These can be useful to policy professionals and academics, but are not practical for the media and public. To increase support for and build understanding of indicators, a process of public consultations or trial application is needed to legitimise indicators. An effective SEA process will involve such consultations.

In terms of SEA indicators to address green economy challenges, two key challenges must be faced:

- The need to address growing complexity. As our understanding of the complexity of green economy and sustainability grows, how do we manage the mountains of data required to monitor it?
- The demand for simplicity. Since public education and resulting political action are seen increasingly and urgently as the purpose for creating indicators, how do we present them in ways that are simple, elegant and effective, without compromising the underlying complexity?

[Table 3] Illustrative environmental issues and related indicators

Issues	Indicators
Climate change	<ul style="list-style-type: none"> ■ Carbon emissions (ton/year) ■ Renewable energy (share of power supply) (%) ■ Energy consumption per capita (Btu/person)
Ecosystem management	<ul style="list-style-type: none"> ■ Forest land (ha) ■ Water stress (%) ■ Land and marine conservation area (ha)
Resource efficiency	<ul style="list-style-type: none"> ■ Energy productivity (Btu/\$) ■ Material productivity (ton/\$) ■ Water productivity (m³/\$) ■ CO₂ productivity (ton/\$)
Chemicals & waste management	<ul style="list-style-type: none"> ■ Waste collection (%) ■ Waste recycling and reuse (%) ■ Waste generation (ton/year) or landfill area (ha)

Source: UNEP, 2012.

Based on experience in Central America, in 2000, the International Center for Tropical Agriculture (CIAT) produced a useful toolkit (available at <http://webapp.ciat.cgiar.org/indicators/toolkit.htm>) with lessons on developing indicators. It covers topics ranging from the development of a conceptual framework to case studies, and a supporting booklet suggests seven key steps (Box 23).

[Box 23] Steps in developing an indicator framework

- 1. Develop a conceptual framework** (clear and flexible), allowing for different approaches to analysing the development process:
 - Sustainable development components (environmental, social, economic);
 - Sustainability issues (eg land use, economic and social dynamics, and natural events);
 - Categories of indicators (pressure, state, impact, and response).
 The framework should also allow for analyses at different levels (regional, national, local).
- 2. Select indicators and explore means for analysis.** Use a set of clear selection criteria (eg data reliability, relevance, causality, measurability and scale). Include different means for analysis:
 - *Indices* to visualise scenarios at aggregated levels (eg regional or national);
 - *Core indicators* to analyse the information obtained from the indices in order to identify causal links, dynamics and impacts;
 - *Complementary indicators* to further refine the analysis for decision-making, often country, area or project specific.
- 3. Establish a consultative network.** Build a network of partners and facilitate a consultative process, eg workshops, visits, capacity-building and training:
 - Discuss and harmonise the framework, issues to monitor, indices and indicators, and work plans;
 - Identify capacities, needs, processes, mandates, responsibilities, uses and interests;
 - Exchange information and data.
- 4. Search data and develop databases.** Survey and improve the production, availability, and use of data and information. This includes use of both existing data and information and identifying when the needed information is missing. Avoid being unrealistic – look at what data exists, [judge its reliability], and use it creatively when developing indices and indicators.

5. Develop tools for causal link analyses and visualisation.

- Develop capacities to analyse and visualise available information;
- Use tools such as land use models and geographical information systems to fill crucial information gaps;
- Enable causal link analyses through the use of different types and sources of information; and
- Visualise the results in a user-friendly manner (maps, tables, figures, animation, time series, and model scenarios).

6. Apply the approach in case studies – to identify strengths and weaknesses in the proposed framework and indicator sets, and test their usefulness:

- Identify new or different needs, gaps in or incorrect information and capacity needs for wider dissemination and use;
- Case studies provide examples of how the information generated can be used at different levels (regional, national, local or sectoral) and for different dimensions (political, administrative, or ecological).

7. Dissemination tools, information and results. Communicate and disseminate information to achieve effective results and sustainability. Means of information dissemination to be used include: websites, publications, training sessions, visits, and CR-ROM (with user-friendly interfaces).

It is important to think about the audience for the indicators before beginning and the uses to which they will be put.

Source: Sengestam *et al.* (2000).

Clearly such a set of steps is likely to be too time-consuming and complex for most SEA processes, but elements of this approach will be helpful. A critical step will be to set criteria for their selection. Donnelly *et al.* (2006) describe the development of criteria for selecting environmental indicators for use in SEA through a multi-disciplinary, workshop-based approach involving environment and planning experts, academics and consultants. Some suggested criteria are listed in Table 4.

A useful entry point to access information on work on indicators (particularly for sustainable development) is the online directory of sustainable development indicators initiatives maintained by the International Institute for Sustainable Development (IISD) (see www.iisd.org/measure/compendium). This lists activities at national and international levels by governments, non-governmental organizations (NGOs) and individuals. In addition to their use for measuring progress toward sustainable development, such indicators can be used to assess the sustainability of proposed actions and future trends.

Many indicator sets present separate indicators or targets for economic, social and environmental concerns. Traditionally, the aim was to balance these so that progress in one was not to the detriment of another. As the United Nations University (UNU) puts it, in SEA terms, “a small environmental cost could be counterbalanced by a large social or economic gain”²³. The concept of sustainable development emphasises “integrating” the different types of objectives. The UNU argues that if we take the often used model of sustainable development showing three intersecting circles – environment, society, economy – with the central part representing sustainability, then for SEA, “a sustainable strategic action would be one that performs positively for all three types of indicators”. An alternative model is one with three concentric circles: economy within society within environment – indicating that sustainability is about ensuring that human society lives within the environment’s limits, and that the economy meets society’s needs. Following this model, the UNU suggests that, for SEA, ‘integration’ would “involve the use of different types of indicators: indicators that reflect this hierarchy and that internalise the integration”. The UK Local Government Management Board’s indicators are an example of this (Box 24): it would be difficult to categorise any of the indicators as being purely environmental, social or economic.

[Table 4] Some criteria for selecting environmental indicators for SEA

Criterion	Brief description
Policy relevant	Consistent with significant legislation already in existence
Cover a range of environmental receptors	The data gathered should provide information that extends beyond that which is being measured
Relevant to the plan	Plan-specific environmental impacts should be detectable
Shows trends	Responsive to change, measurable, capable of being updated regularly, demonstrates progress towards a target
Understandable	Ability to communicate information to a level appropriate for making policy decisions and to the general public
Well-founded in scientific & technical terms	Data should be supported by sound collection methodologies, clearly defined, easily reproduced, and cost-effective
Prioritise key issues & provide early warning	Identifies areas most at risk of damage. Provide early warning of potential problems before it is too late
Adaptable	Emphasis can change at different stages of the plan
Identify conflict	With plan objectives in order that alternatives may be explored

Source: Donnelly *et al.*, 2007.

Most SEA textbooks address the need to use indicators and many provide sample lists for particular issues/themes, and in many countries there are publicly available guidance documents suggesting indicators that can be used in SEA. For example, practitioners in Scotland and Northern Ireland can turn to SNIFFER – a dedicated website (see <http://www.seaguidance.org.uk/1/Homepage.aspx>) with example indicators for monitoring the effects on air, soil and water of implementing plans, programmes and strategies.

There is also a wide range of papers and articles on the use of SEA indicators in particular contexts. For example, a note by Nelson and Boden (2005) discusses the development and application of landscape indicators in SEAs of Local Transport Plans (LTPs) in the UK. It summarises underlying requirements, considers baseline information likely to be available to most local authorities, and notes the practical difficulties in quantifying the nature and magnitude of landscape changes. Examples are given of relevant baseline information and the types of indicators that may be used (eg Table 5). Local authorities are advised to identify those indicators that are relevant to the specific landscape issues in their area and can be effectively monitored over time.

Also on the theme of transport, a report by the former French National Institute for Transport and Safety Research (INRETS)²⁴ discusses how environmental impacts of transport can be measured, how measurements can be transformed into operational indicators, how several indicators can be jointly considered, and how indicators are used in planning and decision-making (Journard and Gudmundsson, 2010).

In many developing countries, there is likely to be a need to build capacity for the collection and evaluation of data in order to use indicators in support of policy-making for a green economy.

[23] http://sea.unu.edu/course/?page_id=50

[24] Merged in 2011 with the French Central Laboratory of Roads and Bridges to form a new research institute – the French Institute for Sciences and Technologies of Transport, Planning and Networks.

[Box 24] Examples of integrated indicators used by the UK Local Government Management Board

1. Resources are used efficiently and waste is minimised by closing cycles.
2. Pollution is limited to levels which natural systems can cope with and without damage.
3. The diversity of nature is valued and protected.
4. Where possible, local needs are met locally.
5. Everyone has access to good food, water, shelter and fuel at reasonable cost.
6. Everyone has the opportunity to undertake satisfying work in a diverse economy. The value of unpaid work is recognised, whilst payments for work are fair and fairly distributed.
7. Peoples' good health is protected by creating safe, clean, pleasant environments and health services which emphasise prevention of illness as well as proper care for the sick.
8. Access to facilities, services, goods and other people is not achieved at the expense of the environment or limited to those with cars.
9. People live without fear of personal violence from crime or persecution because of their personal beliefs, race, gender or sexuality.
10. Everyone has access to the skills, knowledge and information needed to enable them to play a full part in society.
11. All sections of the community are empowered to participate in decision-making.
12. Places, spaces and objects combine meaning and beauty with utility. Settlements are 'human' in scale and form. Diversity and local distinctiveness are valued and protected.

Source: http://sea.unu.edu/course/?page_id=50

[Table 5] Landscape indicators for the objective to protect landscape features and assets from inappropriate transport-related development

Examples of baseline information	Potential SEA indicators	Target	Sources of data
<ul style="list-style-type: none">■ Designated landscape protection areas■ Landscape character areas■ Important woodlands■ Open grasslands■ Features of geological importance (eg scarp slopes, limestone pavements, drumlins)■ Historic Parkland and Gardens■ Archaeological sites and battlefields■ Prominent buildings of historical and/or archaeological interest■ Monuments, follies, and other landmarks	<p>Assessment of the landscape or other environmental effects of local transport plan policies or proposals resulting in major construction within identified areas such as:</p> <ul style="list-style-type: none">■ Airport extensions■ New flight paths■ New road/rail routes■ Road widening■ Transport interchanges■ Car parks■ Park and ride sites	<p>No significant adverse landscape effects from transport-related development in sensitive landscape areas</p>	<ul style="list-style-type: none">■ EIAs of major projects■ Monitoring of development control planning decisions

Source: Nelson and Boden, 2005

[5] SEA and social concerns

The social dimension of sustainable development is often marginalized in green economy analysis and policy. For example, despite serious debate around ways in which equity, human rights and justice (critical factors in poverty reduction, pro-poor growth and environmental sustainability) can be integrated with economic or environmental priorities, these issues remain on the margins of the mainstream green economy agenda.

The UN Research Institute for Social Development (UNRISD) argues that questions about how green economy strategies impact different social groups and patterns of inequality are also sidelined; whose values, priorities and interests are shaping the concept and policies of green economy; and what alternative visions and processes exist at local, national and global scales to achieve social, environmental and economic objectives in a holistic way? SEA can play a key role in addressing such issues²⁵. In the absence of appropriate social policies, the green economy may exacerbate existing gender inequities to the detriment of overall sustainability. Gender is still largely considered to be about women rather than about a vital dynamic in society (Box 25) and many development decisions fail to take account of how gender affects communities' and people's interactions with their environment. Another key point is that the informal sector makes a significant, though often overlooked, contribution to the green economy, and women play a significant role in informal market activities.

[Box 25] Gender – a vital dynamic in society

"Often gender issues are seen as a concern of the global north. The interlocking of production and social reproduction, the formal and informal sectors, and the constantly evolving relations between men and women, and between younger and older generations, are at the heart of this dynamic. A strong analysis of gender and generation is crucial to understanding power imbalances and being able to influence them.

Social change is closely intertwined with the articulation between production and social reproduction. Both are essential for individuals, households, communities and wider societies to function. They are also related to gendered roles and responsibilities, where social reproduction²⁶ is usually associated with women and production with men. However, this distinction is fluid, reflecting different 'public' provision of social reproduction services, women's (and men's) participation in labour markets, wealth and status inequalities, and the constantly evolving relations between men and women as well as between younger and older generations.

In times of economic instability, the state has traditionally curtailed its role in the provision of services, relying instead on households. This usually means an increase in the burdens traditionally shouldered by women, such as care for children and the elderly. While this mostly directly affects women, it also affects all household members as it becomes more difficult for women to reconcile productive and reproductive activities. Vulnerability to stresses and shocks thus increases as incomes decline. There can also, however, be unexpected consequences, for example the growing number of young women and girls who migrate to urban centres responding to demand for domestic service by urban households. In turn, their remittances are often a crucial element of rural livelihoods, especially in areas where family farming is under threat from environmental and socio-economic transformations".

Source: <http://www.iied.org/making-gender-generation-matter>

[25] <http://www.scribd.com/doc/94808942/From-Green-Economy-to-Green-Society-Bringing-the-Social-to-Rio-20>

[26] Social reproduction refers to the structures and activities that transmit social inequality from one generation to the next.

Stevens (2012) comments that,

“As workers, women are being excluded from the green economy due to gender-segregated employment patterns and discrimination. As consumers, women are more likely than men to buy eco-friendly products but they have limited purchasing power. As citizens, women are crucial to good governance in the green economy but have little influence because very few women hold management positions in both public and private sectors.”

She suggests policies that would assure a fuller role for women, including putting female empowerment at the centre of development assistance programmes that aim to promote the green economy in developing countries; mandating business to adopt family-friendly practices to increase women's participation in green jobs; giving women special skills training to work in the green economy; and enacting quotas to get more women onto corporate boards and in top-level management positions in industry and government to increase their influence over the shape of the green economy.

SEA applied in the context of green economy (eg for policy reform, planning, programmes and specific actions and investments) needs to include a focus on gender analysis (see also Box 26). Gender is fundamental to understanding issues concerning ownership and rights to use land, and women usually have least access to productive resources, and then are usually left to manage the most marginalised and degraded lands. Capacity-building for SEA should take a close look at how to build closer relationships between national mechanisms responsible for SEAs, and those for gender equity and mainstreaming.

[Box 26] Mainstreaming gender in climate change policy

Policy reform is part of the process of social and institutional change and gender is an important dynamic that underpins such change. Yet many policies are developed without taking adequate account of gender issues. This is illustrated in a recent paper by Mainley and Tan (2012) which shows that gender differences have been insufficiently addressed in the development and implementation of policies and plans for adaptation to climate change in Nepal. They identify several mechanisms to promote the mainstreaming of gender in climate change policies in Nepal – which can and should be addressed in SEA:

- Generating disaggregated data on livelihood strategies;
- A community-led, bottom-up approach to identify challenges;
- The empowerment and capacity-building of women to adapt to changes, eg in climate;
- Detailed and context specific assessment of the differential impacts of climate change on women and men, drawing on the existing local knowledge;
- Strengthening existing organisations and initiatives which already have gender equity objectives;
- The strengthening of existing legal frameworks and tools;
- Incorporating a consistent gender analysis in the development of projects that specifically target women.

Thus, a key question in the transition to a green economy is – will it be seized as an opportunity to transform social structures, institutions and power relations for more resilient, inclusive and equitable societies (and, in doing so, will it eliminate or reduce social exclusion²⁷. Or will it be limited to technological fixes and market-based solutions that support ‘business-as-usual’

[27] Social exclusion is a concept often used to characterise contemporary forms of social disadvantage. The latter have been described as processes in which individuals and entire communities are systematically blocked from rights, opportunities and resources (e.g. housing, employment, healthcare, civic engagement, democratic participation and due process) that are normally available to members of society and which are key to social integration. Some argue that exclusion in rural areas can be greater than in urban areas since in such areas there is less access to goods, services and facilities, making life difficult in many respects.

Whilst there can be good and legitimate reasons for an SEA to focus dominantly on environmental concerns such as pollution or loss of biodiversity, good practice also addresses social and economic issues such as employment, relocation or health impacts. Indeed the OECD DAC defines SEA as a range of *"analytical and participatory approaches that aim to integrate environmental considerations into policies, plans and programmes and evaluate the interlinkages with economic and social considerations"* (OECD DAC 2006). The guidance argues (page 52) that SEA should support mechanisms that increase social accountability:

"Social accountability can be increased by focusing on electoral processes, legal and judicial reforms, independent audits and oversight processes, and access to information. All efforts to increase the rights of the citizens and hold governments and officials accountable are likely to lead to improved governance and greater transparency. An additional element is the support to CSOs to enable them to be more effective in the policy dialogue and to increase their analytical capacity."

Both the European SEA Directive and the UNECE SEA Protocol also include a need to address social effects of plans and development activities (see italicised factors below) and economic ones as well:

The Directive refers to *"biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors"*, whilst the Protocol refers to: *"human health, flora, fauna, biodiversity, soil, climate, air, water, landscape, natural sites, material assets, cultural heritage and the interaction among these factors"*.

As the UN University course module on SEA²⁸ notes:

"Considering all three dimensions in SEA enables trade-offs to be considered between different types of issues, for instance, why a strategic action may propose new houses (on overriding social grounds) despite the fact that they will have negative impacts on land use, ecology, etc. Consideration of social and economic as well as environmental issues could also be perceived by planners as being more well-rounded and realistic."

A key principle of SEA is that it should involve effective and sustained public engagement to ensure that the perceptions of stakeholders (including the poor and marginalized) are addressed and validated using the best possible available evidence, taking into account their relative environmental vulnerability and power to influence decision-making processes. Thus, careful stakeholder analysis is a key step in SEA screening to guide the development of a public engagement process.

The World Bank has a strong focus on addressing social concerns in its assessment processes. Poverty and Social Impact Assessment (PSIA) (see World Bank 2003) examines the distributional impact of policy reforms on the well-being or welfare of different stakeholder groups; and has played an important role in the elaboration and implementation of poverty reduction strategies in developing countries. The World Bank has made a specific commitment (Operational Directive 8.60) for when PSIAs will be undertaken. PSIA has focused almost exclusively on economic, social, political and institutional analysis. Initially environmental considerations were put aside to allow the integration of the other methods and tools. Many of these tools are already used in SEA, or are likely to be relevant as SEA becomes more holistic. These tools are now well documented and there are increasing examples of good practice to draw on²⁹. Whilst there has been good progress, there is a need to address environmental concerns more strongly to ensure the longer-term sustainability of proposed interventions. Progress in integrating SEA and PSIA will help towards a more sustainability-oriented form of impact assessment.

[28] http://sea.unu.edu/course/?page_id=50

[29] See: <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/EXTPSIA/0,,menuPK:490139~pagePK:149018~piPK:149093~theSitePK:490130,00.html>

In order to obtain aid and debt relief through the Heavily Indebted Poor Countries (HIPC) Initiative, the International Monetary Fund (IMF) and the World Bank require a recipient country to develop a Poverty Reduction Strategy Paper (PRSP). In a PRSP, the country's government is asked to describe "the macroeconomic, structural and social policies and programmes over a three-year or longer horizon to promote broad-based growth and reduce poverty, as well as associated external financing needs and major sources of financing" (IMF, 2003). PRSPs are developed by bringing together domestic stakeholders as well as partner countries and institutions. The articulated development goals and priority areas are intended to guide government's and donors' expenditures. Many PRSPs only weakly address environmental concerns. To address this issue, SEA has been applied to some PRSPs. For example, in 2003, the Government of Benin approved the first PRSP for the years 2003 to 2005. But it only addressed the environment as a separate sector (in a stand-alone chapter) and not as a cross-cutting issue. So, to 'green' the follow-up strategy, the Agence Béninoise de l'Environnement (ABE) (Beninese environmental agency) undertook an SEA during 2006-07 as part of the preparatory process for the second PRSP. It involved extensive multi-stakeholder dialogues and contributed significantly to harmonising development policies, linking poverty reduction to environmental sustainability (Dagba *et al.*, 2012).

The World Bank now promotes Strategic Environmental and Social Assessment (SESA) as a form of SEA as part of its safeguard tools. The definition of SESA (in Operational Policy 4.01) is identical to that of SEA in the OECD DAC's SEA guidance – see above³⁰. The Asian Development Bank also uses SESA in its safeguards toolkit policy-based lending. This term has the benefit of focusing on both the environmental and social dimensions whereas SEA can sometimes be assumed (wrongly) not to address social concerns.

SESA is being applied, for example, to identify the likely impacts and risks, as well as opportunities, of REDD³¹ programmes and to consequently make more informed and appropriate choices between strategic options. The principal outcome of such an assessment would be a social and environmental management framework to advise a country on how to address social and environmental issues for site-specific investments during the 3-year REDD readiness phase. Slunge *et al.* (2011) discuss the potential contribution of SESA to REDD+ initiatives drawing on experiences from earlier attempts to large-scale forestry sector reforms and a recent World Bank pilot programme on SEA. They conclude that SESA has potential to contribute to enhancing policy-making and governance through focusing attention on environmental and social priorities, strengthening constituencies for policy change and improving social accountability. But to do so it needs:

"To be assured that broad national 'ownership' is achieved and that it becomes part of a long-term policy learning process with repeated and sustained stakeholder interaction. Through strengthening constituencies in policy reform, SESA can potentially reduce the risk of regulatory capture of REDD+ by vested interests and make institutional checks and balances more effective."

As previously pointed out, addressing social concerns including those related to the poor and marginalized, as well as gender issues, is central to good practice in SEA. Indeed there are many examples of SEAs that fulfill these requirements. For example, the Millennium Challenge Corporation (MCC) commissioned an SEA of its proposed Namibia Compact (MCC 2008) which addressed specifically:

"How effective will each activity be in empowering women, opening up new opportunities and status for young people, countering the marginalization of some ethnic groups, and strengthening

[30] See: <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,contentMDK:20066691~menuPK:64701637~pagePK:64709096~piPK:64709108~theSitePK:502184,00.html>

[31] REDD: Reducing emissions from deforestation and forest degradation is a set of steps designed to use market and financial incentives in order to reduce the emissions of greenhouse gases from deforestation and forest degradation. The REDD "+" is more than just avoided deforestation. It also addresses sustainable management of forests, conservation of forest carbon stocks and enhancement of carbon stocks.

the governance frameworks that are essential for livelihood security? INP [indigenous natural product] activities can probably most help women and the severely impoverished and marginalized in the short-term. In the longer term, it is the Education Project that should achieve the greatest social and gender benefits for the greatest number of people."

Another MCC SEA in Tanzania also focused on poor farming and fishing communities on Mafia Island lying off the mainland coast (Box 27).

[Box 27] SEA of Mafia Island, Tanzania

Mafia Island is an increasingly popular tourism destination for underwater and cultural experience. The Millennium Challenge Corporation proposed to support the upgrading of the island's airport. It commissioned an SEA to determine strategic policy issues and options needing to be addressed by decision-makers and provide a long-term planning framework for the island. The majority of the people in Mafia are poor subsistence farmers and fishers. Local people have not benefited much from tourism development because the sector is not fully integrated into the district economy, such that few of the commodities produced locally find their way into the tourist markets. For example, most of Mafia's excess milk production is wasted due to the lack of a means to produce and preserve different milk products for local markets and for export. Increased sale of land to lodge developers has resulted in complaints about irregular land acquisition involving local leaders and intermediaries.

The SEA involved extensive participatory engagement with key stakeholders, focus group discussions, and meetings with government and religious leaders and elders, informed groups, NGOs and private actors.

Amongst the alternatives considered (IRG 2008) were sources of energy. Reliable energy supply is critical for tourism development on Mafia. Currently, energy is provided mainly by diesel generators which are constantly interrupted by lack of diesel or breakdown. The proposed airport and other potential economic activities, such as copra industries, fish processing, SMEs, and lodges and hotels, will require a reliable energy supply. Therefore, the SEA examined potentially sustainable and reliable energy options. Two of these options are solar power and undersea cables to connect Mafia with the national electricity grid.

The SEA concluded that a solar energy option could target specific service areas as well as local communities to reduce the use of generators. In addition, the airport facilities could run on solar power provided better systems are obtained. This could offer a short-term measure while the more reliable option of undersea cables is considered. Connecting Mafia with the national grid will improve livelihoods; guarantee power to industries, SME, and tourism development; and provide local communities with reliable energy in line with national policies. The environmental, social, and political gains arising from this alternative are very significant.

Source: IRG (2008) Summary. Prepared for the Millennium Challenge Account. International Resources Group, Washington DC

But it must also be recognised that vulnerable and marginalised communities usually lack the capacity and power to participate meaningfully in EIA or SEA processes – a problem exacerbated by lack of education and access to information. But some countries are directly addressing this issue. For example, in South Africa, the Department of Environmental Affairs devotes a Sub-Theme to empowering marginalised communities in its Environmental Impact Assessment and Management Strategy (EIAMS) (DEA 2011) – it includes goals to:

- Ensure equitable/fair empowerment of marginalised communities within the public participation of the EIAMS processes;
- Ensure equitable/fair empowerment of marginalised communities in terms of training opportunities;
- Ensure equitable/fair empowerment of marginalised communities in terms of environmental awareness;
- Improve equitable/fair access to resources/funding in order to undertake environmental information management studies if necessary or to participate meaningfully in public participation processes.

In situations where development initiatives for a green economy are likely to affect marginal communities, it is essential that participation processes and communications methodologies are adjusted to be appropriate to their capacities. DEA (2011) cite the example of providing trackers in the Kgalagadi area of Botswana with tools that enable them to monitor the location of various animals and plant species by reporting their location using GPS technology. Some of the most highly skilled trackers in Africa cannot read or write: "To overcome this problem, the Cyber-Tracker was developed with an icon-based user interface that enabled expert non-literate trackers to record complex geo-referenced observations on animal behaviour"³².

[32] <http://www.cybertracker.org/ftp/Kalahari/2011%20WKCC%20Report.pdf>

[6] Key questions in assessing GE-related policies, plans and programmes

An early issue that should arise in developing a GE-related PPP (or, in fact, any PPP, whether or not it is specifically for GE purposes) is whether an SEA is appropriate and relevant in relation to its development? (the screening step in Figure 1). Integral to this will be to establish the objectives and role of the SEA, particularly how it can improve the process of developing such a PPP. A key principle of an SEA is to explore alternatives. So the sooner an SEA is introduced in the PPP process, the greater will be the chances that it can be used to identify opportunities and influence outcomes.

Box 28 provides a checklist of generic questions applicable to most contexts in which GE-related PPPs are likely to arise in development cooperation. These can be used in a rapid way to first review the potential for negative impacts and need for an SEA, and then more thoroughly during implementation of the SEA.

[Box 28] Generic questions for SEAs

Principles and scope

- Have adequate principles, criteria and indicators been defined for the SEA?
- Has the spatial and temporal scope of the SEA been adequately defined?
- Is there a need/opportunity for donor co-ordination in the conduct of the SEA?
- Have alternatives (to the proposed PPP) been identified and considered?

Linkage to other strategies, policies and plans

- Have all relevant strategies, policies and plans – at national to local levels – been reviewed (e.g. PRS, MDG-based strategy, district plan) and is the assessed PPP supportive of, and consistent with, their goals? Have any conflicts been taken into account in the design of the proposal?

Effects

- Have the potential direct, indirect and cumulative negative and/or positive effects (short-, medium- and long-term; environmental and social) of the proposed PPP been predicted and analysed?
- Have relevant, specific measures been identified and included to counteract/mitigate these? Alternatively, is it made clear how other national policies/programmes are mitigating the potential negative effects?
- Is there potential for enhancing positive effects? Have these opportunities been maximised?
- Has the quality of the assessment been independently reviewed?

Stakeholder engagement

- Have all relevant stakeholders had an opportunity to engage in the SEA process and to identify potential impacts and management measures?
- In particular, have the views of civil society, particularly affected communities, being included? What has been their influence in the development of the proposed PPP?

Capacity

- Is there sufficient capacity within institutions and agencies, at national and sub-national levels, to implement the specific PPP (e.g. to enable them to apply an environmental management framework for sub-elements); and to manage, regulate and be accountable for use of natural resources? How can these institutions be strengthened?
- Is there an institutional framework to manage environmental impacts and major environmental resource policy and institutional failures?

- Is the environmental policy framework and legislative authority in place to respond to any problems that might arise?

Influence of SEA

- Are there specific points in the process to develop the PPP where the SEA can have influence over decisions or design?

Data, information and monitoring

- Are there significant data and information deficiencies and gaps? How can these be filled?
- Are measures proposed for monitoring? Are these clear, practicable and linked to the indicators and objectives used in the SEA? Are responsibilities clear?

Source: OECD DAC (2006).

Additional questions can be found in an OECD paper that proposes an analytical framework for assessing policies that will contribute to a better integration of environmental externalities in the pursuit of economic efficiency and growth objectives (de Serres *et al.*, 2010). This includes a checklist of questions for green policy assessment, including a set related to environmental challenges, that provide some guidance on how to identify the most appropriate policy instruments to address environmental challenges in specific countries (Box 29). The paper argues that, in general, putting a price on a pollution source or on the over-exploitation of a scarce resource is found to be the most efficient single policy to address many environment externalities. However, given that environmental damage often results from several interacting market failures, an appropriate policy response will in many cases involve a mix of complementary instruments. It is concluded, *inter alia*, that in assessing the best policy strategy to foster green growth, the environmental side-effects of existing sectoral policies should be examined, notably in the areas of energy, agriculture or trade, to establish whether regulation and/or subsidies result in both economic inefficiency and environmental damage.

[Box 29] Checklist of questions for the general assessment of environmental challenges of green policies and current policy setting

- How important [and at what scales] are the environmental challenges in each of the key areas, i.e. climate, bio-diversity and quality of ecosystems, natural resources, and waste management?
- To what extent are the identified challenges of a local, nation-wide or cross-border nature?
- Are there estimates of the marginal social cost of the main externalities available? Are these estimates sufficiently informative (and reliable) to provide a basis for setting environmental objectives?
- What instruments, if any, are currently used to address the identified challenges? Are there estimates of the costs and benefits from application of these instruments? Is regulatory impact analysis used to assess costs and benefits?
- Are there potential environmental side-effects from sectoral policies aimed at objectives other than environmental (especially in transport, energy, agriculture, foreign trade and investment, and urban development)? To what extent do these policies, notably economic subsidies, contribute to the mitigation or aggravation of the environmental challenges? Are the beneficiaries of environmentally-harmful subsidies and the circumstances under which these subsidies are provided transparent to the general public?
- What alternative instruments could be used to achieve the objective pursued by the environmentally-harmful subsidies in a way that could raise both economic efficiency and environmental integrity? What temporary compensation measures could be envisaged to support the process of phasing-out environmentally-harmful subsidies?
- Concerning abatement of CO₂ emissions, are estimated costs of abatement roughly similar across sectors? Are they within the range provided by commonly-used models?

Source: de Serres *et al.* (2010).

[7] So where next?

The concept of the Green Economy has emerged recently following the world-wide economic crisis and in response to climate change issues and a range of persistent environmental challenges. In many ways, the idea of GE is synonymous with sustainable development – at least many of the actions necessary to progress towards the goal of GE are identical to those needed to move towards sustainable development. So what works well for sustainable development should be effective in promoting GE.

There already exists a wealth of experience of what is required to make progress towards sustainable development and what has been successful or less so. We know, for example, that it is critical to continue to raise environmental awareness amongst all actors and at all levels, and to make concerted efforts to mainstream environmental considerations in policies, planning and decisions. Appropriate and effective mechanisms and tools are needed to support and achieve these objectives. SEA has emerged over the past 20 years as a key process in this regard, with many countries and organisations introducing legal requirements for its applications, eg the EU SEA Directive. And SEA uptake across the world is growing rapidly.

There is now an urgent need for the SEA community – professionals and practitioners – to become more aware of the GE movement, understand its aims, modalities and initiatives, identify how SEA can help to support the goal of GE, and establish links with those engaged in promoting and implementing GE initiatives. In this regard, we need to explain in clear and simple terms what is the role and function of SEA and how it can support GE efforts in an efficient and effective manner.

At the same time, the broad community of actors now engaged in pursuing GE need to be aware that much has been learned in the past 20 years in working to make progress towards the goal of sustainable development that can be harnessed in pursuit of GE. We should avoid reinventing the wheel. And, in this regard, key environmental mainstreaming processes such as SEA have much to offer.

As a first step in bringing together the SEA and GE communities, the OECD DAC SEA Task Team organized an African regional workshop on SEA and Green Economy, held in Lusaka, Zambia, in January 2013. The workshop was attended by representatives from many African countries including SEA system managers and practitioners and senior individuals in government, the private sector and civil society concerned with economic development, planning and investment. Participants considered several case studies of SEA applied to green economy issues and identified a range of drivers for, and challenges to, SEA in the context of GE (Box 30). They also reached consensus on a number of recommendations which provide elements of a programme for further action to promote SEA uptake to support GE.

[Box 30] Some drivers of, and challenges to, SEA in the context of GE

Drivers

- Need to improve planning for national development programmes;
- Need for a tool to enable national planning processes to monitor environmental information, undertake effective scoping for initiatives, and to resolve conflicts;
- Policy/legal requirements for SEA, including enforcement procedures;
- Lending requirements (eg of multi-lateral development banks) usually require SEA;
- Increasing stakeholder pressure – from NGOs, environment agencies, and development agencies (eg Forest Carbon Partnership Facility requirements for SESA);
- High growth rates (rush for minerals, fish, gas, etc.) makes the need for a strategic approach to environmental integration more clear (in the context of worsening environmental situation, including social component). In Zambia, for example, a biofuel producer directly approached the Head of State to secure a concession. No proper EIA was undertaken. Such problems provide a motivation for using SEA (in this case, it would point to areas where biofuel plantations could be considered, and where not);
- International commitments, ie Paris Declaration;
- Need to manage natural resources sustainably and reduce risk and uncertainty arising, for example, from climate change, conflict or trans-boundary issues;
- Need to lend legitimacy to policy choices for the efficient use of resources and to maximise socio-economic requirements in an accountable transparent and integrated manner;
- Democratic right for social equity inclusiveness and participation, including inter-generational equity;
- Need to prioritise public spending and investment for sustainable infrastructure development and planning;
- Need to ensure greener approaches, responding to new/emerging trends;
- Need to achieve resource efficiency and strike a balance between conservation and socioeconomic objectives;
- Need to overcome the limitations of EIA, and provide flexible instrument that easily accommodates GE;
- Cross-boundary issues, striking balance between social and economic choices;
- In countries emerging from conflict, green economy can be an opportunity – it has been taken up by both Sierra Leone and Rwanda;
- Need for increased country stability and reliability for private sector – they tend to invest in countries where there is a good standard of governance and stability. Large company investments tend to be in stable countries, not necessarily in those with the most minerals. SEA can be an important tool to achieve stability and good environmental governance.

Challenges/constraints

- Low levels of awareness of environmental issues (at all levels and in all quarters). Limited knowledge and understanding of role and benefit of SEA;
- Confusion about how SEA relates to other tools (eg State of Environment reports) – need for more SEA success stories; and lack clarity between SEA and GG/GE concept;
- Need to foster collaboration between environment and other sectors, so that they feel ownership for SEA as well. But SEA proponents/practitioners should take other instruments seriously and make links with them – they have a role to play;
- Lack of political will to undertake SEA. Currently, few high level officials and actors are aware that economic, social and environmental issues are closely connected. Political leadership is a necessary condition in successful uptake and implementation of SEA;

- How to link SEA with political decision-making? It is challenging to integrate SEA in the political process which is often confidential and constantly changing. It requires SEA professionals to acquire new skills and capacities;
- Competing priorities of different stakeholders – some stakeholders have a low level of understanding/ or acceptance of SEA (eg private sector);
- SEA is an accepted concept whilst green economy is emerging. Need to put green economy in a proper context before applying SEAs which might result in inadequate incentives and political buy-in;
- Inadequate, weak, poorly coordinated or lacking policy, legal and institutional frameworks in some countries to undertake implement, monitor and enforce SEA. For example, in Tanzania EIA is the responsibility of the National Environment Management Council, whilst SEA falls under Vice president office;
- Inadequate monitoring of SEA may negate or reduce the value of SEA recommendations;
- Inadequate capacity to understand, implement and monitor/evaluate SEAs and green economy issues at all levels of decision-making, coupled with inadequate awareness of SEAs including stocking taking of their impacts;
- Financial constraints to undertake SEA;
- Need to make a business case for SEA and link to other sector's interests;
- It is not easy to measure success in SEA;
- The word 'green' may be a challenge and may be considered a stumbling block by some people – it is sometimes interpreted as a brake on development – so maybe better to approach SEAs in context of sustainable development;
- There may be a perception that SEAs and green economy issues require extra time and cost;
- How best to engage the media and enhance perceptions of SEA? – need good understanding to communicate to all actors, including local communities (need to simplify message and provide in local languages);
- Lack of 'champions' for SEA;
- Conflict of changing paradigms – there is confusion amongst some people about whether SEA aims to promote sustainable development, green growth or something else;
- Need to create awareness of the concepts of SEA and GG and capacity to implement SEA amongst stakeholders. SEA should be inclusive to all stakeholders. But stakeholder interests are dynamic. The challenge is to make SEA sufficiently flexible to deal with this dynamism. This relates to the challenge in SEA to produce binding recommendations on the one hand, yet be flexible to respond to an ever changing context and new insights;
- Need careful planning for stakeholder engagement. Must create trust with stakeholders, be consistent and provide feedback (stakeholders' concerns are often not adequately addressed);
- Misconception that SEA only relates to the environment and is concerned only with an environmental agenda;
- Need for cooperation between sectors – respecting their different views and perceptions; need to create awareness of SEA in sectors;
- SEAs need rapid data which sometimes is not readily available – so SEAs can end up being more like baseline studies;
- Most SEAs in Africa are done/led by non-African consultants;
- EIA experts 'pretend' they are also experts on SEA, but in practice different skills and competences are needed.

Workshop discussions confirmed that there is growing political will in Africa to do things differently, especially with respect to the extractives sector. It was agreed that costly social and environmental problems arising from poor planning decisions must no longer be the status quo. There was also recognition that current and newly discovered hydrocarbon and mineral resources will be vital for Africa's development for years to come. Oil, natural gas and minerals will remain critical to underpin Africa's efforts to meet its development objectives. However, there was a strong view that green growth methods and principles, coupled with the use of SEA, can be used – particularly in the extractives sector – to achieve development objectives that meet a multitude of stakeholder needs in a more sustainable fashion.

A number of key recommendations made by the workshop are discussed below. These recommendations are also likely to be highly relevant to promoting increased application of SEA in support of GE in other parts of the world.

Priority should be given to establishing a **strong business case for SEA** which should be communicated through a short briefing note rather than guidelines. It should set out clearly why SEA is important, how it relates to green economy and other assessment tools, how it can help (with good concise evidence) and what value it can add, etc. It will be important to clarify what SEA can and cannot do, and where other instruments should be used. The business case should indicate how SEA can help in finding opportunities for economic growth, and what the trade-offs are between economy, environment and social issues.

In support of such a business case briefing note, and to illustrate how SEA works and helps, **case studies are needed** that show the success of SEA in meeting objectives and influencing decisions/outcomes, and also as a basis for capacity development. Such case studies are important in benchmarking and sharing of SEA experience (both successes and failures). They will help to show how to streamline processes and reduce costs, and are essential for capacity- and awareness building and ensuring buy-in across key actors (eg parliamentarians, government institutions and officials, SEA practitioners, inter-governmental bodies, business leaders and corporate organisations, environmental journalists, civil society, etc.).

It is essential to **link green economy directly to sustainable development (SD)**. Most developing countries have 'bought into' the latter concept and have many effective SD initiatives. It is important to show how green economy/growth links to this and can support it. Linked to this, SEA should be promoted as a support process for sustainable development through mainstreaming environment in the finance and planning sectors with legislative backing. In this regard, **SEA should be incorporated in national budget processes**. Ministries of Environment should work with Ministries of Finance and Planning at a national level and ensure that sector ministries include provisions in their budgets for undertaking SEAs.

Careful consideration is needed in communicating and positioning the idea of SEA as a critical tool for the key players involved in promoting, and achieving green growth – in government, private sector and civil society. A compelling and well-presented business case will help to persuade such players about how SEA can help, and will help to ensure that finance is available for SEA and to reduce environmental risks. It will also be important to identify a range of **champion(s)** willing to present the case for SEA, and to identify those who can act as 'brokers' between the different sectors relevant to green economy. Traditionally, SEA has been a process mainly for government, whilst the private sector has engaged mainly in EIA for projects. So it will be critical to find champions able to promote the case for SEA in the private sector as well as endorsing its value with government.

The establishment of **national SEA and GE Focal Groups** should be encouraged to act as a focal point for developing in-country links between those responsible for SEA and green growth teams. Such links will help to avoid duplication of effort – there are examples of different communities in the same country more or less doing the same thing. They should also foster a high level dialogue on SEA and green growth – as a platform for exchange. Such Focal Groups would be well placed to identify and engage with potential national champions (as discussed above) and support them in promoting SEA for green economy. In addition, the Focal Groups should develop links between SEA and green economy communities and experts in countries – which currently tend to be isolated from each other, as well as promote SEA uptake amongst a wide range of stakeholders. Various mechanisms could be used such as national round tables and facilitating inter-ministerial knowledge sharing on SEA. Similar bodies have played important roles in relation to other issues (eg national AIDS Commissions). These Focal Groups could undertake or organize a range of initiatives, eg organising national needs assessments (eg for SEA training), identifying existing programmes relating to SEA and GE and checking gaps, and coordinating the development of locally-relevant training programmes. There may be a requirement for technical support to such Focal Groups. And south-south collaboration between them will be important.

In any country, an initial step in a country might be to just **make a start** by identifying a green economy/growth initiative (preferably one being proposed rather one already under implementation) and secure agreement to apply SEA to it to help its development. There is great value in establishing **pilot and demonstration examples** of SEA applied to green economy initiatives.

SEA needs to link to the operational demands of green growth by including a **focus on growth and green jobs creation** as well as other issues such as food security, vulnerability to climate change.

It will be important to **assess what stage individual countries have reached in transitioning to a green economy** as a starting point for determining how SEA might most effectively be employed to support the process.

At the political level, it is important to find a place for SEA and green economy **on the agenda of the continental political bodies** (eg the African Union) and **regional cooperation organisations** (eg SADC, ECOWAS).

There was strong support to establish a **professional network** on 'Linkedin' – to share experiences and enable debate on SEA and green economy.

Capacity building and awareness-raising is a key requirement in all sectors for both SEA and green economy/growth. SEA awareness campaigns are needed, for example, for the media, high level decision-makers, and business, and to engage civil society to secure public support. Another role for the national Focal Groups would be to assess national capacity development needs for SEA and prepare a strategy for action, identifying where external support might be needed. Awareness, capacity and buy-in can be promoted through **further regional workshops** on SEA and green economy (eg in Asia and Latin America) and synthesising the learning from such events, and through South-South and North-South exchanges.

There is an urgent need to establish a **conducive enabling 'environment' for SEA** – supporting policies, legislation and strategies – where not already in place. And where in place, there is a need for SEA implementation and coordination, building on existing structures (eg inter-ministerial committees, existing policies, etc.). There may be a need to update, strengthen or reform relevant laws to include SEA as a requirement for policies, plans and programmes, and to develop regulations (with teeth) and guidelines. **SEA should be anchored** through using existing

references to sustainable development or environmental integration in national visions and national development plans in order not to introduce it as something completely new.

In conducting SEAs, it is critical to ensure they **deliver critical information for green economy** – the kind of information that actors involved in promoting green economy/growth need and are interested in.

A **minimum benchmark for SEAs** should be defined, identifying which initiatives need to be subjected to SEA – not all initiatives necessarily require an SEA. This will help avoid overloading national systems with many SEAs which cannot be handled, particularly in countries with limited skills and capacity. It is perhaps better to put a limit on a few well-conducted SEAs per year, focusing on the most strategic policies and plans.

It is important to **make SEA relevant for both (a) government** – paying particular attention to SEA products, formats and communication that makes SEA interesting and attractive to higher government levels, **and (b) private sector**, eg by showing how it can clarify the risks to their profits by undertaking cost-benefit analysis at a more strategic level (so that accumulated risks become clear – that will not be revealed by EIAs).

There is no doubt that we will need to pay particular attention to the **context within which SEA** is applied. This is likely to have a strong determining effect on the ability of SEA to play an effective supporting role and to benefit and influence decision-making concerning the green economy. In this regard, Fisher (2007) notes six key context conditions that support SEA in making greener decisions:

- Formal requirements and clear provisions to conduct and effectively consider SEA;
- Clear goals for assessment;
- Appropriate funding, time and support;
- Achieving a willingness to co-operate – considering and influencing traditional decision-making approaches;
- Setting clear boundaries – addressing the right issues at the right time and defining the roles of assessors;
- Acknowledging and dealing with uncertainties.

In discussing the future direction of economic development in a country, a key strength of SEA is that, when done well, it provides a mechanism to help **integrate independent perspectives** into the process of policy-making, developing strategies and planning. Such an element of 'independency' in these processes is critical to overcome the typical problems that arise from stakeholders thinking introspectively in 'group mode', assuming tunnel vision attitudes towards proposals, or compromising early in the processes. SEA can show the blind spots and the unexpected gains that might result from particular development directions. It enables the structured input of non-biased, unprejudiced, independent perspectives, that strengthen decisions.

The concept of green economy/growth is gathering momentum and will help in advancing countries towards achieving sustainable development. More and more countries are experimenting with and generating experience of SEA as a tool to integrate environmental concerns in policies, plans and programmes. It is now time to harness this experience to support the journey to green growth – to turn green the strategic way.

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Turning green the strategic way

The role and potential of strategic environmental assessment in securing a green economy

Strategic environmental assessment (SEA) is a powerful process for integrating environmental and linked social and economic concerns into policy-making, planning, programme development, mega projects and development decision-making. Over the last 20 years there has been increasing uptake of SEA around the world. More than 60 countries at all levels of development (including all 27 EU member states) now have legislation, policies, directives or regulations prescribing the application of SEA, and many more are introducing it as part of their policy toolkits – although it is not necessarily used effectively and many development actors are unaware of its function, value and potential. At the UN Rio+20 conference in 2012, the emergent green economy concept was a central theme, but it was agreed that nationally (as opposed to globally) driven approaches should be the way forward, so that green economy policies can be properly tailored. Attention has therefore turned to how SEA can help in promoting a transition to green economic development.

This paper provides a preliminary exploration of the links between SEA and green economy, and the role of SEA in supporting decision-making for green growth in relation to a range of entry points: government policies, plans and programmes; climate change and low-carbon growth; sustainable transport; waste management, water and sanitation; ecosystems and sustainable use of biodiversity; sustainable agriculture/food production and supply; green energy and trade. It also discusses the use of indicators in monitoring SEA and the treatment of social concerns, particularly gender. Throughout, the text is supported by case examples illustrating its application in different contexts relevant to green economy. A final section discusses a range of steps that might be taken to encourage and facilitate increased use of SEA as an environmental mainstreaming tool in support of transitioning to a green economy.

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