



Arab Development Challenges Background Paper 2011

Sustainable Development & Green Economy
in the Arab Region

Kishan Khoday





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Regional Centre in Cairo (RCC)
1191 Corniche El Nil, 4th Floor, WTC Building,
1159 Boulac, P.O. Box 982, Cairo, Egypt

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* Kishan Khoday has served with UNDP since 1997, as UNDP Deputy Coordinator for Environment & Natural Resources in Indonesia (1997-2005), UNDP Assistant Resident Representative and Team Leader for Energy & Environment in China (2005-2009) and UNDP Deputy Resident Representative in Saudi Arabia (since 2009). (kishan.khoday@undp.org)

Acronyms and Abbreviations

AC	Arab countries
AfDB	African Development Bank
AFED	Arab Forum on Environment and Development
CSOs	Civil Society Organizations
DESA	Department of Economic and Social Affairs
ESCWA	Economic and Social Commission for Western Asia
EU	European Union
GDP	Gross Domestic Product
ILO	International Labour Organization
IMF	International Monetary Fund
IPCC	Inter-Governmental Panel on Climate Change
LEED	Leadership in Environment, Energy and Design
MDGs	Millennium Development Goals
OECD	Organization of Economic Co-operation and Development
UAE	United Arab Emirates
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
WEO	World Economic Outlook

Introduction

The systemic transition underway across the Arab region is a civil society call for more transparent, accountable and participatory governance, action against corruption and human rights abuses and economic reform to address the rising challenges of youth employment. Meanwhile, many of these problems are indirectly related to issues of equity and sustainability in the use of natural resources and the environment. Control over the environment has for decades been central to state legitimacy and power in the region, shaping the nature of autocratic and centralized systems of governance and influencing how sovereignty and statecraft function in the region.

As noted in the 2010 Human Development Report, the Arab region made remarkable progress on the Human Development Index (HDI) from 1970 to 2010. However this often came at the expense of the natural capital which serves at the base of human development. The Arab region has seen a history of the rich receiving disproportionate benefits from the exploitation of natural resources and the environment, while the poor bear a disproportionate burden through lack of benefits from resource use and impacts of pollution on health and well-being. With much of the region's poor heavily reliant on rural livelihoods such as agriculture and fisheries, ecosystem goods and services like arable land, adequate water and a stable climate have stood at the base of many of the region's human development results. But as impacts mount, serious concerns exist for the sustainability of these hard-won development gains.¹

In this paper, two main arguments are proposed. First, environmental sustainability entails social empowerment and enhanced freedom of opportunity. Beyond increased personal consumption, this includes increased accountability and freedom from the inequities that often result from systems of resource exploitation and disproportionate impacts of ecological change. Second, as demand for solutions to food, water and energy challenges grow; the market for green solutions has surged globally, with large potential for the Arab region to benefit from these innovations and to potentially take a lead role in their further development and application. A need exists for public policy, strategies and regulatory frameworks that incentivize and promote green solutions, investment and technology.

Sustainable Development as Freedom

Beyond being a mere market externality, ecological change is now eroding the foundations of human security in the Arab region and the ability to sustain a certain quality of life for future generations.² While communities recognize the important role that natural resources and the environment have played in past human development results, the severity of ecological change and resource depletion now “calls into question the Enlightenment principle that human progress will make the future look better than the past”.³ While analyses of the links between environment and human development often focus on consumption sustainability, a broader perspective is needed to address the important role of natural resources and the environment as a means to expanding people's long-term choices and freedoms. The capacity to deal with ecological change is quickly becoming a universally-valued capacity, without which basic freedoms and rights to development, human

¹ AFED, *Arab Forum on Environment and Development* (2009), 2.

² UNDP, *2009 Arab Human Development Report: Human Security in the Arab World*, United Nations Publications, New York (2009), 22.

³ UNDP, *2007 Human Development Report: Fighting Climate Change: Human Solidarity in a Divided World*, Palgrave Macmillan, New York (2007), 1.

security and human development stand in jeopardy.⁴

Food security, for example, played an exacerbating role in the emergence of civil society movements in 2011. The combination of unemployment and spiking food prices serves as a potent mixture in many countries. This in turn was partially attributable to the result of climate impacts on global food production, with record droughts in Russia and flooding in Pakistan and Australia in 2010. Statistics showed well in advance of the social movements that an excessive proportion of household incomes in many Arab countries, more than 35% in countries like Tunisia and Egypt, were allocated to purchase of food items.⁵ Exacerbating this are local trends in food security, with North Africa expected to see some of the worst impacts of climate change over the coming decades.⁶

Water security has also play a significant role in social grievances in the Arab region, which already stands as the most water stressed region in the world.⁷ Some of the recent civil protests in Jordan, for example, may have been partly sparked by tribal grievances over lack of access to water resources for local livelihoods and agriculture.⁸ In Syria, recent years have seen a wave of internal migrations owing to severe droughts, while water stands as a bottleneck to equitable and sustainable development in Yemen and in Saudi Arabia chronic floods in early-2011 in Jeddah led to rare public protests with calls for public accountability and long-standing issues of urban environmental services and infrastructure.⁹

Energy use also has critical links to the transition. While oil exports revenues have served as a foundation for social welfare initiatives and human development gains in many countries in the region, reserves are on the decline at just the time when the region experiences a youth bulge with expanding needs for new employment and social welfare needs. As countries seek to boost youth employment opportunities through industrial growth, local energy intensity has risen dramatically in recent times, with an 88% carbon emission growth rate in recent years.¹⁰ As a result, many in the region now seek to expand energy efficiency and renewable energy to reduce the energy intensity of new growth and save increasingly scarce oil resources for export revenues.

As countries across the region craft new social compacts for development, the equitable and sustainable use of natural resources and the environment will likely emerge as a central issue of contention. Higher expectations will emerge within society for more effective, accountable and participatory use of natural wealth as a public good, combating corruption, preventing the squandering of natural wealth and preserving its value for future generations. The social compact in many countries has been defined by a balance between the state control over natural wealth and provision of social development results. In analyzing the political economy of natural resources and the environment in the Arab region it becomes clear that political power and economic wealth have been generated from strategic use of the environment and that challenges exist in expanding the benefits of this natural wealth for the benefit of the average citizen and the poor in particular.¹¹

The emerging process of institutional and economic reforms across the region stands as an opportunity to address entrenched systems of control, broaden access and benefit-sharing

⁴ Partha Dasgupta, *Nature's Role in Sustaining Economic Development*, Philosophical Transactions of the Royal Society (2010) 365, 5–11, 5. London..

⁵ Subbaraman et al (2010), *Food Price Trends*, Nomura, 2010.

⁶ Balgis Osman Elasha, *Mapping of Climate Change Threats and Human Development Impacts in the Arab Region*, Arab Human Development Report Paper Series, UNDP, New York. (2010), 14-15.

⁷ AFED (Arab Forum on Environment and Development) (2009), *Impact of Climate Change on the Arab Countries*, AFED, Beirut.

⁸ Nicolas Pelham, *Jordan's Balancing Act*, Middle East Report Online, February 22, 2011.

⁹ Khaleej Times, *Saudi plans Jeddah projects after floods*, protests, 2 February, 2011.

¹⁰ Osman-Elasha.

¹¹ See David Reed, *Analyzing the Political Economy of Poverty and Ecological Disruption*, WWF Macroeconomics Programme Office, Washington DC (2004).

related to natural wealth, expand the role of local governance and strengthen resilience of the natural asset base on which the poor depend. Furthermore, as noted below the transition also provides space to rethink the role of natural resources in the economy, with new green economy concepts potentially providing a channel to increase the efficiency of resource use while generating new knowledge-based approaches to innovation and competitiveness.

In the classic *Development as Freedom*, Amartya Sen argued that development was ‘not the mere accumulation of goods but the enhanced freedom to choose, to lead the kind of life one values’.¹² The focus on the role of human agency and inclusive governance are central to understanding new trends in the Arab region and the call to freedom. In recent years ecological change has also emerged as a major challenge to the human development paradigm. In addressing the convergence of these trends, it is argued that a shift is now needed to move from the original *Development as Freedom* model towards a ‘Sustainable Development as Freedom’ model, with sustainability emerging as a sixth freedom alongside the five pillars reviewed in *Arab Development Challenges Report (2011)*.¹³ “The question can thus be asked whether environmental priorities should be seen in terms also of sustaining our freedoms. Should we not be concerned with preserving – and when possible expanding – the substantive freedoms of people today without compromising the ability of future generations to have similar, or more, freedoms?”¹⁴

As noted by Anand and Sen, sustainable development is about more than charity, it is critically about justice and accountability.¹⁵ As chants of freedom and calls for a new era of inclusive and equitable development arise across the Arab region, the history of unsustainable and inequitable use of natural resources such as land, water, energy and minerals will likely emerge as a central focus of reform. As noted further below, of particular importance is the nexus of food, water and energy security in the region and their central role in creating a new green economy for the future. This comes at a time of historic and transformational change in the Arab region, as the world also seeks to adapt to one of the most severe economic downturns in history. “One can only hope that the current political turbulence will give rise to far-sighted leadership and a climate that embraces and supports” pathways to equity and sustainability.¹⁶ The cumulative impacts of ecological change affect the freedoms and choices of individuals and the capacity of countries to achieve inclusive growth and sustainable development. As countries in the Arab region look to the future, there is a feeling that we are moving into terra incognita where the forms of old are being recast, with the current transformative moment in the Arab region holding out hope for a more equitable and sustainable future.

Resource scarcity and ecological change in the Arab region

Human security in the coming decades will be greatly affected by the implications of living in a resource-constrained region, with the cumulative impacts of ecological change affecting the likelihood of inequity and the frequency and magnitude of droughts, floods and other disasters that largely impact the poor. “Access to ecological services will become an ever more critical factor for economic success and resilience in the 21st century.”¹⁷ This is especially so when one considered the cumulative impact of changing climate, shrinking energy and water reserves and challenges to food security, with many fearing a “peak everything” scenario as commodity demands surge over the coming decades.¹⁸ The impacts of inequity and ecological change together affect the prospects for sustaining human

¹² Amartya Sen, *Development as Freedom*, Anchor Books (1999), 16.

¹³ UNDP 2011.

¹⁴ Amartya Sen, ‘*Why We Should Conserve the Spotted Owl*’, ALDR, Volume 13:6, London (2004).

¹⁵ Ananda and Amartya Sen (1994), *Sustainable Human Development*, UNDP, New York, 1.

¹⁶ Middle East Institute, *The Environment and the Middle East*, Middle East Institute, Washington DC (2011), 9.

¹⁷ Global Footprint Network, *The 2010 Ecological Footprint Atlas*, Global Footprint Network, (2010) USA, 5.

¹⁸ See Richard Heinberg, *Peak Everything: Waking Up to Centuries of Decline*, New Society Publishers, Gabriola Island, Canada (2007)..

development, the range of freedoms and choices of individuals and the capacity of Governments in the region to achieve inclusive growth and development. The growing ecological deficits facing the region will have profound political, economic and social consequences. As populations grow and consumption levels of society and industry continue to mount, the pressures on fragile ecosystems and increasingly scarce natural resources have become a major concern for Governments across the world. In recent years, the Arab region has experienced a surge in demand for natural resource commodities such as oil, gas, water, timber and minerals, owing to an expansion of economic liberalization, an expanding middle-class with rapidly increasing per capita income levels and increased global demand from emerging economies. Meanwhile, decades of exploitation have left the region's resources at risk as demands continue to grow and ecological capacities continue to shrink. In some cases, these new pressures are felt by local communities that host these resources, exacerbating pre-existing tensions and bringing risks to human development goals.

A key concept to analyze the interaction of rising consumption and carrying capacity of the environment is the Ecological Footprint, which compares humanity's rising demands with changing levels of ecological goods and services.¹⁹ Recent estimates show a dramatic rise in humanity's ecological footprint over recent years, with global society now overshooting ecological capacity by 40%, equivalent to using the ecological goods and services of 1.3 Earths.²⁰ By 2030, we will be using the equivalent of 2 planets, creating greater pressures on equity and sustainability of human development. With the Arab region hosting one of the most ecologically fragile and water scarce environments, pressures on carrying capacity are of particular importance in sustaining poverty reduction efforts. The population of the Arab region has nearly tripled since 1970, climbing from 128 million to 359 million, with a population of 598 million expected by 2050, increasing by two-thirds over 2010 levels.

While achieving some of the world's fastest rates of progress on human development indicators over the past decades, this has also resulted in escalating ecological footprints and decreased carrying ecological capacities, with risks for the future sustainability of development trends and the maintenance of peace and human security. Egypt's per capita ecological footprint increased by 77% and Tunisia's increased by 26% from 1961-2006.²¹ On the other hand, Morocco reduced its ecological footprint by 11%, Iraq by 21% and Sudan by 35% over the same period.

Climate change creates an exacerbating factor to underlying challenges to resource scarcity and expanding consumption trends. This holds true in the Arab region more than others, hosting the world's lowest levels of water security and some of the world's fastest carbon emission growth rates.²² The risks and opportunities associated with climate change are now emerging within development discourse across the region, with a focus on adaptive capacities needed to sustain poverty reduction results and the rise of new clean energy policies to set the foundations for the low-carbon economies of the future. As noted by Amat Alsoswa, UN Assistant Secretary General and Director of the UNDP Regional Bureau for Arab States, "climate change is a development challenge that is both complex and vitally important. It is essential for the Arab region to come together, demystify the challenge and lay the foundation for a concrete and coordinated response. There is a good deal of discussion and research on climate change at the global level. The challenge is to localize

¹⁹ Global Footprint Network, *The 2010 Ecological Footprint Atlas*, Global Footprint Network, (2010) USA. See also Global Footprint Network, *The Ecological Wealth of Nations*, Global Footprint Network, (2010), USA. See also Donella Meadows, Jorgen Randers and Dennis Meadows, *Limits to Growth: The 30-Year Update*, Chelsea Green Publishing Company, White River Junction, Vermont, USA (2004).

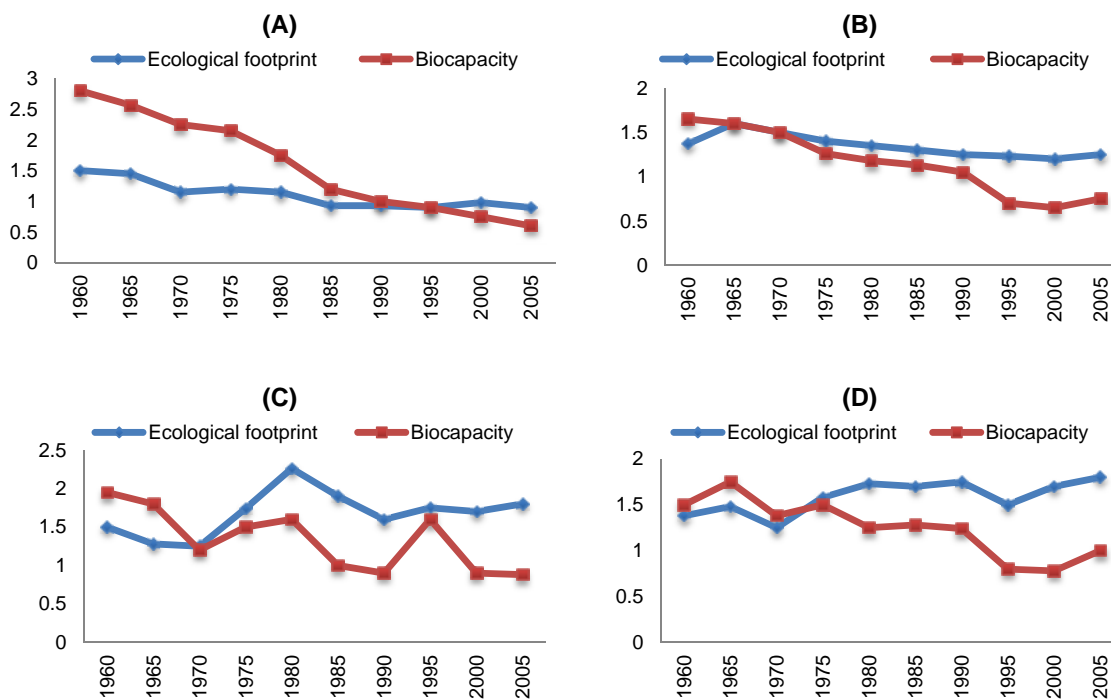
²⁰ Erik Assadourian, *State of the World*, Earthscan, London (2010), 4.

²¹ Global Footprint Network, *The Ecological Wealth of Nations*, Global Footprint Network, (2010), USA, 30.

²² Osman- Elasha 2010.

the discussion in the Arab context.”²³

Figure 1: Ecological footprints and bio-capacity in Yemen (A), Morocco (B), Syria (C) and Tunisia (D), 1960-2005



Source: replicated from Global Footprint Network

Low-emission, climate resilient strategies have become a priority for engaging the risks and opportunities from climate change. Within this process leadership is needed by Government, the private sector and civil society to find innovative solutions. Current development patterns do not fully capture climate change challenges and opportunities and a need exists to elaborate and apply new frameworks that mainstream climate change into poverty reduction and MDGs policies.²⁴ Climate change presents an unprecedented challenge, but also an opportunity to do development differently. Even in countries where MDGs progress is on track, climate change brings serious risks for sustaining results beyond 2015. “Climate change presents a new and real threat of severe environmental, economic and political and security impacts in the Arab region. For a region that is already vulnerable to many non-climate stresses, climate change and its potential physical and socioeconomic impacts are likely to exacerbate this vulnerability, leading to large scale instability.”²⁵

Action is needed to prevent an exacerbation of inequality and poverty in the region and prevent the emergence of climate-induced resource scarcity, migration and conflict.²⁶ The increased severity and frequency of climate impacts has resulted in heightened awareness within society and Governments of the serious nature of climate risks and the vulnerability of human development. The far-reaching nature of these changes poses risks to delivery of the

²³ Amat Alsoswa, *UNDP and the Government of Morocco Launch the Arab Climate Resilience Initiative Regional Forum*, Press Release, Rabat, November 3, 2010.

²⁴ Yanchun Zhang, *Climate Change and Development: Interlinked Challenges and Opportunities*, UNDP Office of Development Studies, New York (2009), 5.

²⁵ Osman-Elasha 2010.

²⁶ Zhang 2009: 2.

MDGs promise and to the region's economies and livelihoods. Tourism and agriculture are highly sensitive to climate and frequency of extreme events. Both sectors contribute significantly to the economy of most Arab countries in terms of GDP and employment, a key concern in a region with an average unemployment rate of 14.4% and a large youth population.²⁷ In some countries, over half of the work force is employed in agriculture, thus reduced productivity would result in return of poverty unless preventive measures are taken and social protections put in place.

Human development could face a number of climate-induced tipping points in coming years - decreased agricultural productivity, heightened water insecurity, increased fragility of ecosystems, increased health risks and increased exposure to extreme events.²⁸ Climate change projections show that harsher conditions lie ahead, with millions of people across the region at risk of being affected. Globally, the year 2010 was the hottest year on record with a series of extreme events and disasters in the region including record heat waves, floods and droughts. The Inter-Governmental Panel on Climate Change (IPCC) Fourth Assessment Report (2007) estimated an increase in temperature in the Arab region of up to 2°C by 2030 and 4°C by 2100, with reduction of water run-off by 20-30% by 2050, owing to rising temperatures, less precipitation and increased drought likelihood.²⁹ As noted above, many parts of North Africa and in particular Morocco, are already experiencing more droughts with a doubling of drought frequency from once every decade a century ago, to once every two years on average currently.³⁰ Meanwhile IPCC projections foresee risks from sea level rise to coastal communities of the Egyptian delta where a 0.5 meter sea level rise could displace 2-4 million people by 2050, with risks to other coastal populations across the region including Bahrain, the only small island state in the region.³¹

The Arab region is one of the most vulnerable to climate change owing to its status as the most water insecure region. Although the Arab world has a common heritage, it has never been confronted with a common economic threat comparable to climate change.³² At the same time, the exact nexus between climate change and human development is highly country specific. Countries differ in terms of exposure, vulnerability and adaptive capacity. Over the last century the Arab region has experienced warming of up to 0.5°C, with significant increases of 0.5° to 3°C in Morocco, Algeria, Tunisia and Saudi Arabia, while Somalia has experienced decreasing mean temperatures of 0.5°C.³³ Out of twenty-two Arab countries, fifteen are among the world's most-water stressed countries with water per capita of less than 1,000 m³.³⁴ In some countries like Sudan and parts of North Africa precipitation has decreased by up to 10% in recent decades. Almost all Arab countries are highly vulnerable to climate change, with 90% of the region classified as arid, semi-arid and dry sub-humid.³⁵ More than half of the region's land receives average annual rainfall of less than 100mm while the highlands and coastal areas of Lebanon, Syria and North Africa and southern Sudan, experience as much as 1,500 mm of rainfall per year.³⁶

Increasing resource scarcity and strains on ecological carrying capacity are also creating risks to peace and conflict. The convergence of resource scarcity and increased consumption demands could trigger new conflicts or exacerbate existing tensions. As noted

²⁷ UNDP, *Arab Climate Resilience Initiative: Concept Paper*, UNDP, New York (2010), at 4.

²⁸ See UNDP, *2007 Human Development Report: Fighting Climate Change: Human Solidarity in a Divided World*, Palgrave Macmillan, New York (2007).

²⁹ Milly *et al*, "Global pattern of trends in streamflow and water availability in a changing climate", *Nature*, Vol. 438/17, (2005).

³⁰ Osman-Elasha¹⁵.

³¹ Osman-Elasha:10.

³² UNDG, *Climate Change and Food Security in the Arab Region*, Regional UNDG, Cairo (Forthcoming), 2.

³³ UNDP, *Arab Climate Resilience Initiative: Concept Paper*, UNDP, New York (2010), at 3.

³⁴ UNDP, *2006 Human Development Report: Beyond Scarcity: Power, poverty, and the global water crisis*. Palgrave Macmillan, New York (2006), 44.

³⁵ Abahussain *et al*, "Desertification in the Arab Region: analysis of current status and trends." *Journal of Arid Environments*. Volume 51, (2002), 521-545.

³⁶ Osman-Elasha.

by the Economic and Social Commission for West Asia (ESCWA), root causes of instability in the Arab region include a “wide frustration gap...despite abundant natural resources, the huge demographic expansion have not been sufficiently analyzed within the context of stability. Equally absent is an examination of best practices for the use of the region’s resources aimed at addressing the demographic challenges.”³⁷ As further noted by UN Secretary General Ban Ki-moon, climate change is a “threat multiplier.”³⁸

“When resources are scarce - whether energy, water or arable land -- our fragile ecosystems become strained, as do the coping mechanisms of groups and individuals. This can lead to a breakdown of established codes of conduct and even outright conflict.”³⁹ As countries around the world face increasing ecological change “prepare for a torrent of forced migrations...Over the course of a few decades, if not sooner...people may be compelled to relocate because of environmental pressures...Small changes in climate can cause wars, topple governments and crush economies already strained by poverty, corruption and ethnic conflict.”⁴⁰ The Arab region is at particular risk with prevailing conditions of water and food insecurity, high levels of poverty and increasing cross-border and internal competition over land use and shared water resources. Addressing local grievances and bringing about peace is essential for achieving poverty reduction and sustainable development goals in the region, with inclusive governance regarded as the most likely path to peace by defusing discontent.

Governance for Sustainable Development

Social accountability and the environment

The links between environmental sustainability and human well-being are complex and are mediated by systems of governance. Systems of laws, policies and institutions serve as the substrate of politics and society and the web of relations between the state, private sector and civil society that codify common concerns, objectives and means of achieving them. But all too often unaccountable, non-transparent and non-participatory forms of governance in the Arab region have been the cause of disempowerment, inequity and unsustainability for the poor. Through ongoing calls for reforms in the region, an opportunity has now arisen for a new era of development, in which the rule of law takes shape as a force for accountable and inclusive governance of natural resources and the environment for the empowerment of the poor. As a result of systemic transitions across the region, coming years will be marked by a re-examination of the foundations, efficacy and capacity of policies and institutions to meet development goals.

Ecological change presents an unprecedented challenge to achieving and sustaining poverty reduction and peace, but it is also an opportunity to do development differently. Vulnerable communities are the ones most suffering the burden of environmental degradation and inequitable sharing of resources, including the consequences for emergence of conflicts as noted above, while also being the ones least able to mobilize against abuse of power, corruption and other causes of inequity and unsustainable policies. The poor tend to live in communities with scarce resources or are heavily reliant on natural resources for livelihoods, while also often suffering disproportionately the ill effects of pollution.⁴¹

³⁷ ESCWA (2010), *Report of the Expert Group Meeting on Policies for Peacebuilding and Conflict Prevention in Western Asia*, ESCWA Report E/ESCWA/ECRI/2010/WG1, Beirut, 7.

³⁸ General Assembly Report A/64/150, *Report of Secretary General of the United Nations to the General Assembly on Climate change and its possible security implications*. United Nations, (2009), New York.

³⁹ UN (2007), *Deliberations of the Climate Change Session*, UN Security Council A/SC/4/14, 17 April 2007, New York.

⁴⁰ Jeffrey Sachs, *Climate Change and Migrations*, Scientific American (2007).

⁴¹ El-Naggar and El-Sayed (2005), *The Geography of Economic Resources and Its relationship to Poverty in Arab Countries: Comparative Indicators with Developed and Developing Countries*, in *Poverty in the Arab World*, El-Naggar (editor), Al-Ahram, Centre for Political and Strategic Studies, Cairo, 9-42.

Inefficient utilization of resources, including land, water and extractive and agriculture sector outputs, is often an outcome of insecure ownership or usage rights and lack of participation by communities in decision-making processes. For the poor, unsustainable resource use and pollution are an affront to their ability and that of their children, to earn a livelihood and to live a healthy life. Efforts to achieve goals of poverty reduction and environmental sustainability now fall within the broader process of calls in the Arab region for more transparent, accountable and participatory forms of governance. The nexus between poverty and environment in the Arab world is defined by lack of accountability and rule of law surrounding natural resource use and the control of pollution. Emerging processes of reform stands as an opportunity to make the kind of transformational progress needed to avoid the far reaching impacts of ecological change.

A spirit of constitutionalism has gripped countries across the Arab region, an organic and dynamic process by which the fundamental principles and policies of the State are under review to address changing power dynamics and drivers of change within society. Adapting to ecological change is not only about managing change within institutions, but fundamentally about accountability and changing behaviour. While the science of ecological change elaborates the 'why' and 'what' of the challenge, governance addresses the 'how' of making effective links to poverty reduction and broader human development goals. As noted by Anand and Sen, sustainable development is about more than charity, it is critically about justice and accountability.⁴² Justice is an "ideal of accountability and fairness in the protection and vindication of rights and the prevention and punishment of wrongs."⁴³ About three quarters of the world's population falls outside of the rule of law and the Arab region has historically been among the most excluded from the benefits of human rights and access to justice.⁴⁴

Putting in place accountability systems can create possibilities for ecologically-resilient development and help protect against risks to public welfare. Accountability systems can help check abuse of power by officials and ensure effective functioning of government policies related to sustainability and equity of natural resource use. This includes two key components: answerability as the obligation to provide an account and the right to get a response as to the status of natural resource policies and actions; and enforceability as the means of ensuring that actions are taken and redress provided for inequitable natural resource use or ecological impacts.⁴⁵ Accountability can be applied vertical by society on governments through public participation in decision-making and claims against the state and it can be applied horizontal by State actors among public institutions such as legislative oversight of public administration or judicial checks on administrative discretion and abuse. Central to the functioning of accountability systems is the rule of law. "Environmental degradation generates further poverty by the exhaustion of natural resources and creates prejudice to the exercise of basic rights".⁴⁶ "The rule of law...refers to a principle of governance in which all persons, institutions and entities, public and private, including the state itself, are accountable to law".⁴⁷

Legal empowerment and rights-based approaches

A Human Rights-Based Approach (HRBA) to poverty reduction is an important framework through which to engage the role of citizens and CSOs in future poverty reduction discourse

⁴² Ananda and Amartya Sen (1994), *Sustainable Human Development*, UNDP, New York, 1.

⁴³ Ibid: 3.

⁴⁴ UNDP (2005), *Legal Empowerment of the Poor*, UNDP, New York.

⁴⁵ UNDP (2010), *Fostering Social Accountability: A Guidance Note*, UNDP, Oslo.

⁴⁶ IUCN (2007), *Human Rights and the Environment: Overlapping Issues*, IUCN, Gland, 1.

⁴⁷ UNDP and the Commission for the Legal Empowerment of the Poor (2008), *Making the Law Work for Everyone, Volume II Working Group Reports*, UNDP, New York, 2-3.

in the region. Ecological change is now seen as critical to achieving basic social and economic rights.⁴⁸ “Environmental harms and human rights abuses often go together” and are symptomatic of political and socio-economic contexts through which threats to environment also constitute threats to life, livelihood and health.⁴⁹ The UN Special Rapporteur on Human Rights and the Environment further elaborated the importance of HRBA, arguing that the right to development would be violated if trends of ecological change continue. The UN Special Rapporteur encapsulated this in the idea of a ‘right to prevention of ecological harm’ as part and parcel of the right to development, particularly given the clear impacts of ecological change on poor and vulnerable communities.⁵⁰

“The dominant environmental protection framework in many countries serves to reinforce instead of challenge the stratification of people...and places.” “Current systems have institutionalized unequal enforcement of safety precautions, traded human health for profit...exploited the vulnerability of economically and political disenfranchised communities” and “subsidized ecological destruction”.⁵¹ For the poor, human development, empowerment and enhanced freedom of opportunity means not only increasing personal consumption, but also increased accountability of government to the public, being free from the inequities that often result from entrenched and corrupt systems of resource exploitation and disproportionate impacts of pollution. They increasingly recognize that their voice and engagement in public life is critical to responsive governance mechanisms. Civil society movements for poverty reduction thus often find an important environmental undercurrent to their calls for human rights, whether related to corruption in extraction of natural resources and abuse of power in land and water rights, freedom from the toxic effect of pollution, etc.

The importance of human rights-based approaches to sustainability lies in the importance of civil and political rights to foster a sustainable development-friendly political and legal order. For example, the majority of countries, more than one hundred at the moment, have gone so far as to establish environmental protection as a provision in their Constitutional framework.⁵² A particular focus of HRBA is the poor’s *access to information* regarding natural resources use and pollution which may have a bearing on their livelihoods and well-being, the poor’s *access to participation* in decision-making concerning the natural resources and environment on which they depend and *access to justice* and means of remedy where issues like corruption, abuse of power and violation of legal process causes negative impact on natural resources and environment and in turn on the poor.

Participation in governance entails actions such as integration of environmental sustainability into CSOs lobbying, debating, campaigning etc centred on issues of poverty reduction.⁵³ It could also entail raising issues of environmental sustainability in legislative and regulatory reform hearings on poverty reduction policies and measures that may come about in the future as a result of electoral process and shift to more multi-party and open decision-making in some countries in the region. Participation allows citizens put pressure on decision-makers and allows the poor to become involved in government oversight and accountability processes and very importantly allows citizens and CSOs to participate in Environmental Impact Assessment (EIA) processes which are normally required by law to consider risks from development to ecological sustainability and in turn social welfare. Successes have also been registered around the world on community-based governance of natural resources and the environment with regards to land, water, minerals, forestry, waste management,

⁴⁸ UNEP (2004), *Human Rights and the Environment*, Proceedings of UNEP Geneva Environment Network Roundtable, Geneva. See also Watt-Cloutier (2004), *Climate Change and Human Rights*, Human Rights Dialogue, Series 2 No.11, Carnegie Council, New York, 10-12.

⁴⁹ Id at 9.

⁵⁰ Ibid.

⁵¹ Robert Bullard (2005), *The Quest for Environmental Justice: Human Rights and the Politics of Pollution*, Sierra Club Books, San Francisco, 29.

⁵² Tim Hayward (2005), *Constitutional Environmental Rights*, Oxford University Press, New York, 4.

⁵³ IUCN 2007:8-9.

etc., which can be built on and legislated at the national level as a means of empowering the poor within broader context of shift to rule of law and accountability frameworks. Meanwhile most environment-related public decisions, including those related to the poor, take place through administrative agencies. Thus a country's public administration at national and sub-national levels is a key interface for between issues of accountability and sustainability.

The right to information regarding natural resources use and pollution which may have a bearing on the livelihoods and well-being of the poor is a key foundation for effective participatory governance. Without adequate access to information on the status of natural resources use or the nature of risks from pollution, communities are unable to analyze many of the problems, or solutions, that underlie their poverty. Meanwhile, access to justice and remedy is a foundation for a shift to a rule of law and accountability framework, entailing a "right to a fair and public hearing in front of an independent tribunal".⁵⁴ Indeed the "judicialization of politics" has been a key process around the world for shifting debates over the accountability of development results and nature of development beyond the realm of politics and into the rule of law.⁵⁵ Several important examples exist around the world for enhancing the role of justice systems in review disputes and abuses of natural resources and the environment.⁵⁶ This includes support for the work of legal aid groups, including CSOs who take action on behalf of the poor and marginalized in the society and assist the poor enhance their access to courts which are often limited by inability to pay for legal representation and capacity to articulate claims.⁵⁷

Another critical perspective for adopting HRBA is the emerging framework for the Legal Empowerment of the Poor based on the work of the UN High Level Commission on Legal Empowerment of the Poor launched in 2005. In 2008, following three years of global reviews and analysis, a high level report *Making the Law Work for Everyone* was launched, followed in 2009 by the launch of UN Secretary-General Report on Legal Empowerment and Poverty Eradication (A/64/133) and UN General Assembly Resolution on Legal Empowerment of the Poor. These documents summarize the emerging approach to legal empowerment of the poor, highlighting its operational scope and focus and summarizing national and regional experiences and the role of various organizations of the UN in fostering empowerment of the poor. Increased legal empowerment of the poor in the area of environment requires not only good will, but also a commitment to experimentation, fine-tuning solutions and institution building.⁵⁸ Some conceptual shifts include: "empowering the poor to identify their problems and seek their own solutions and not assuming the poor are the problem; engaging poor people as partners, not as beneficiaries and using people-centred frameworks for planning and implementation, creating incentives for the poor as well as for private-sector entrepreneurs to mobilize resources for poverty eradication and move away from simply exhorting poor people to mobilize their resources or providing all the resources from the State; and seeing the value of giving the poor real rights and ownership of assets, not just a sense of ownership". If governments take steps to make these shifts, experience has shown that poor people will be more inclined to view the government as a viable partner in development.

Legal empowerment of the poor is an agenda of inclusive development that complements other development strategies and linkages to sustainable use of natural resources and the environment are critical. This has important relations to the goal of sustainable development. Legal empowerment can give poor people and communities the legal tools to proactively protect themselves from the effects of climate change and give the poor access to new

⁵⁴ IUCN 2007:10.

⁵⁵ Neal Tate and Torbjorn Valinder (1995), *Global Expansion of Judicial Power*, New York University Press, New York, 1-11

⁵⁶ See George Pring and Catherine Pring (2009), *Greening Justice: Creating and Improving Environmental Courts and Tribunals*, World Resource Institute, Washington D.C..

⁵⁷ Ibid, 13-14.

⁵⁸ UNDP (1999), *Attacking Poverty While Improving the Environment: Towards Win-Win Policy Options*, UNDP, New York, 9-10.

carbon markets. “Secure land rights, for example, will be critical to ensuring that poor farming communities can attract carbon financing to rehabilitate forests, grasslands and agricultural land. Land rights for the poor and equitable access to land would produce a triple dividend: improving livelihood security, stimulating economic development and reducing concentrations of greenhouse gases”.⁵⁹ Achievement of both poverty and environmental sustainability goals requires adherence to the rule of law and a strong legal and institutional framework.

The Green Economy: From Crisis to Opportunity

Conceptual framework: innovation and competitiveness

While the transition in the Arab region holds the potential for governance reforms that address demands for equity and justice, it also holds the challenge of shifting the region’s economy towards a more sustainable path. If not matched by measures to make economic growth more equitable and sustainable, governance reforms may not be able to bring about desired changes for the benefit of sustainable human development. The region faces a convergence of demographic and ecological shifts which threaten the sustainability of development. It hosts the world’s youngest population combined with rapidly rising consumption levels, while also hosting the world’s highest levels of food import dependency and its lowest levels of water security. Furthermore, despite hosting a large share of the world’s energy reserves, the pressure to create new urban-industrial employment for a burgeoning youth population has created a surge in local demand for energy, leading to increasing rates of oil depletion. This combines with a surge in global demand and record energy prices creating vulnerability for many countries in the region, particularly the poor. While this situation is a daunting one, the transition in the Arab region holds with it an opportunity to rethink the trajectory of its economic growth, towards a more equitable and sustainable path.

The green economy concept has arisen as a way forward, as a means of turning the crisis of ecological pressure into an opportunity for new solutions driven by policy innovation, market-based mechanisms and new markets for clean technology. The green economy is defined as an economy “that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.”⁶⁰ It applies to various sectors including agriculture, water, energy, transport, manufacturing, buildings and tourism. Trends of economic growth have historically proceeded at the expense of the environment and loss of natural capital, with disproportionate impacts on the poor.⁶¹ This “gross misallocation of capital” has created GDP and wealth through a “brown economy” model that has failed to address social marginalization and resource depletion.⁶² “The benefits reaped from our engineering of the planet have been achieved by running down natural capital assets”.⁶³

The green economy is characterized by the decoupling of growth from environmental impacts, with a gradual reduction of ecological footprint to bio-capacity ratio from current level of 1.5 to 1.2 by 2050, versus 2.0 in the business as usual scenario. Rather than new green measures being a drag on the economy, or creating new risks to growth, recent

⁵⁹ UNGA (2009), *Report of the UN Secretary General on Legal Empowerment of the Poor and Eradication of Poverty*, UN General Assembly A/64/133, New York, 4-5.

⁶⁰ UNEP, *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication – A Synthesis for Policy Makers*, UNEP, Nairobi (2011), 2.

⁶¹ Paul Steele and Peter Hazlewood, *Concept Note: Green Economy for Poverty Reduction and the MDGs: Policy Challenges and Opportunities*, Poverty-Environment Partnership, UNDP and WRI, New York (2011), 1.

⁶² UNEP 2011:1-2.

⁶³ United Nations, *Synthesis Report-Millennium Ecosystem Assessment*, Island Press, New York (2005), 3. See also Partha Dasgupta, *Nature’s Role in Sustaining Economic Development*, *Philosophical Transactions of the Royal Society* (2010) 365, 5–11.

studies have shown that green investment can help boost growth while at the same time reducing vulnerability to ecological risks. “A green investment scenario achieves higher annual growth rates than the business-as-usual scenario within 5-10 years”.⁶⁴ While ecological scarcity could well emerge as a limit to growth, the green economy concept sees this moment in history as an opportunity to improve the nature of growth and overcome the impending bottlenecks that stand before us. The concept has emerged as way to stimulate economic activity, while responding to “the multiple crises that the world has been facing in recent years – the climate, food and economic crises” and reorienting the economy “from the system that allowed and at times generated, these crises to a system that proactively addresses and prevents them”.⁶⁵

Table 1: Climate Change and the Green Economy⁶⁶

Mapping the Climate Economy - LECRDS	
Towards a Low-Emission Economy*	Towards a Climate-Resilient Economy
Low-Emission Energy System Renewable energy (e.g. wind, solar, biomass, mini-hydro, geothermal, ocean-based energy generation) Energy efficiency and management (e.g. housing and industrial energy efficiency, smart grids)	Infrastructure Hazard and climate-proofing construction (e.g. building, design, water, management, transport, energy, biodiversity corridor; commuting minimization)
Low-Emission Urban and Transport System Low/zero emission vehicles, multi-modal mass transit, urban planning, 3rd generation bio-fuels, etc	Water Early warning systems, flood control, drought management, water storage, supply and sanitation, industrial usage, energy production, irrigation efficiency, watershed management, recreation patterns/tourism, etc.
Low-Emission Manufacturing of Products and Chemicals and Waste Management Clean production of domestic commercial and industrial equipment/appliances and manufactured goods (e.g., refrigeration and AC/appliances), waste avoidance and segregation, 3R, recycling and treatment, clean production, ODS banks collection and disposal, etc.	Health Heat waves, new disease vectors, air quality, food security and nutrition, etc.
Agriculture, Forestry and Ecosystems Low-emission agriculture, peat lands restoration, grazing land management, a forestation, forest management, coastal ecosystem management (e.g., 'blue carbon'), etc.	Agriculture, Natural Resource, Biodiversity and Ecosystems management Landscape planning for climate resilience and maintaining ecosystem production (e.g., diverse matrixed landscapes with protected areas for biodiversity, coastal protection, incentives for on-farm diversity, climate resilient cultivars), risk and hazard insurance, etc.
Climate Change Management Capacity	

Source: UNDP, 2011

⁶⁴ UNEP 2011:23.

⁶⁵ Jose Antonio Ocampo, *The Transition to a Green Economy: Benefits, Challenges and Risks from a Sustainable Development Perspective*, Report of Experts to Second Preparatory Committee for the UN Conference on Sustainable Development (Rio2012), UNDESA, UNEP and UNCTAD, New York (2010), 2.

⁶⁶ UNDP (2011), *Guidebook for Preparing Low-Emission, Climate-Resilient Development Strategies*, UNDP, New York, 6.

The concept of climate competitiveness is a new and important lens to understand climate the economic opportunities from a green transition.⁶⁷ The concept is based on two key variables: accountability, defined as a convergence of leadership and clarity of vision, systemic and institutional capacities; and performance, defined as the results of such systems and policies in achieving transformational change in economic behaviour. According to this new metric, the Arab region ranks lowest among all regions. New national policies in the region can set visions and strategies for achieving transition to a low-emission, climate resilient development strategies (LECRDS).

Furthermore, the green economy could also bring changes to employment patterns and skills requirements, with a positive balance of job creation forecasted in developing countries with “low levels of legacy industry and infrastructure” and relatively less substitution of ‘brown economy’ jobs with green economy jobs.⁶⁸ Looking to examples from other countries, China has created 1.1million jobs in the renewable energy sector as it seeks to reduce the energy intensity of its growth while also reducing carbon emissions, while India has engaged approximately 59million households in its National Rural Employment Guarantee Scheme, an investment in employment related to water conservation, irrigation and land development. The shift to a green economy also includes needs for retraining, as well as new skills for jobs related to green economy growth sectors. In the Arab region, apart from any direct jobs added as a result of new green economy opportunities, more systemic changes in education and training systems may also be required to improve science, technology, engineering and mathematics (STEM) systems in secondary and university education.⁶⁹

Priority opportunities: food, energy, water

The vulnerability of food, water and energy resources brings serious risks to sustaining development in the long-term and stands to exacerbate poverty and insecurity, potentially unravelling social and political stability. Meanwhile all have critical connection to climate change, with energy and agriculture accounting for the vast majority of carbon emissions while water highly impacted by climate risks. The financial, fuel and food crises (dubbed the ‘3F crisis’) of 2008 stood as one example of the risks to social stability, with underlying shifts in global demand and fragility of supply combined to create record prices and political instability in many countries. While 2009 saw pressures subside owing to reduced consumer demand, 2010 saw the end of the global recession and the resumption of strong commodity demand. As a result food and fuel prices have once again raised to the top of the headlines, with major price surges an exacerbating factor in the Arab revolution.

As demand for solutions to food, water and energy grow, the market for green solutions has surged in recent years, with a need for public policy, pricing and regulatory measures to create an enabling environment for the green economy to take root and for growth to move from becoming the source of environmental externalities to a source of green solutions. This would include fiscal policy, subsidy reform, market-based instruments and public investments in green sectors, green procurement and improved enforcement of environmental regulations.

Enhanced access to food, energy and water security helped achieve many human development results in the 20th century. Food security was positively supported by the green revolution, an expansion of agricultural coverage and productivity. Agriculture remains a large contributor to GDP in many countries and serves as the main source of employment for rural communities. But many of the factors that led to improvement, soil fertility, water

⁶⁷ Accountability (2010), *Climate Competitiveness Index*, Accountability, New.

⁶⁸ ILO, *Promoting Decent Work in a Green Economy*, ILO, Geneva (2011), 6-7.

⁶⁹ ILO 2011: 10.

scarcity and energy access, are not longer a certainty in the 21st century. As noted in more detail below, with rising populations and decreasing carrying capacity of land and water in the region, a new green revolution is needed, characterized by a shift to ecologically sound farming, crop diversification and water conservation, use of energy efficiency and renewable energy measures and replenishment of soil nutrients.⁷⁰ Water is also a key element of the green economy concept, with major need to invest in efficiency of water use in irrigation, which accounts for majority of water use in most Arab countries.⁷¹ As noted below, large water savings can be achieved by investing in water recovery and reuse, with equally large scope for investments into industrial wastewater treatment and reuse.

Energy has been a major focus for green investments in recent times, with countries increasingly turning to investments in renewable energy and energy efficiency as a way of reducing dependence on energy imports, as oil prices have surged to all time highs in recent years. This also holds important co-benefits for both energy security and reducing carbon emissions which have increased in the Arab region by 88% per year in recent times.⁷² In 2010 new clean energy investments reached \$180-200billion globally, up from \$160billion in 2009 and mostly driven by investments in developing countries.⁷³ In addition to investments in clean energy firms and technology development, investments are also going into clean energy assessments and mapping, infrastructure for transmission and distribution and research and development. In oil-rich countries this is proceeding as a means of conserving oil for future exports by reducing energy intensity of local growth. As noted in more detail below, countries across the region have established clean energy policies and targets.

Clean technology revolution

Technology has a key role in driving the emergence of structural changes needed for the emergence of the green economy. Some see the clean technology sector as the single largest market opportunity in the 21st century with a 'clean tech' revolution possibly emerging with "deep impacts on production structures as well as consumption patterns".⁷⁴ As a result of the converging economic and ecological challenges taking place around the world, great attention is now placed by investors on public-private partnerships to engage new green economy opportunities, as a means of increasing competitiveness in an inter-connected world. Green investments reached an all-time high in 2010, with 715 deals valued at \$7.77 billion and overall global market capitalization of clean technology sector of \$386 billion in 2010.⁷⁵ It was also a record year for clean technology Initial Public Offerings (IPOs) with 93 IPOs valued at over \$16billion.

The rapid growth of capital markets, the market's increasing interest in green initiatives and the evolution of alternative instruments, such as environmental and carbon finance, are opening up the space for large-scale financing for an economic transformation. The move towards a green economy is happening on a scale and at a speed never seen before and it is bringing driven by large developing economies like Brazil, China and India. Key to the success of such countries in mobilizing green investments for the dual goals of increased global competitiveness and local sustainability has been the establishment of enabling environment of local policies and regulations and engaging leadership from cities at the heart of the growth process. The shift to a green economy in large developing economies is

⁷⁰ UNEP 2011:7.

⁷¹ Fareed Bushehri, *Green Economy in the Arab Region*, Presentation to UNEP Regional Workshop on Trade & Environment, Beirut, 15-16 December 2010, 3.

⁷² Osman-Elasha 2010

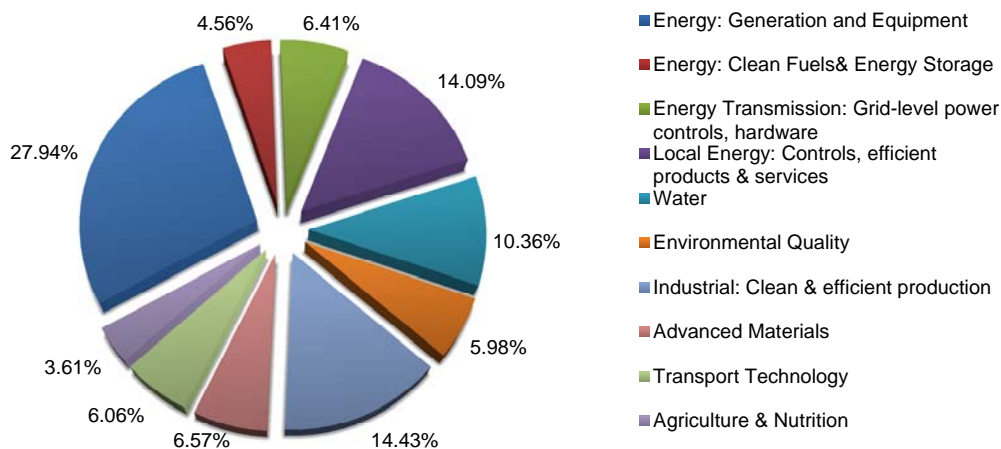
⁷³ UNEP 2011:23.

⁷⁴ Jose Antonio Ocampo, *The Transition to a Green Economy: Benefits, Challenges and Risks from a Sustainable Development Perspective*, Report of Experts to Second Preparatory Committee for the UN Conference on Sustainable Development (Rio2012), UNDESA, UNEP and UNCTAD, New York (2010), 5.

⁷⁵ Nicholas Parker, *The Emerging Global Clean Economy: The Race for Sustainability Prosperity Goes Mainstream*, Cleantech Group, Presentation to the Global Competitiveness Forum, Jan.24, 2011, Riyadh.

about more than increased investment and technology; it is firstly about public policy, strategies and regulatory frameworks, particularly at the city level, to serve as market-based incentives for new green economy initiatives.

Figure 2: Sector Allocation of 2010 Clean Technology Investments (record \$386billion)



Source: Clean tech Group, 2011.

Opportunities exist for countries in the Arab region to merge into this global trend, building on its long-standing position as an energy sector world leader. Existing expertise and industrial capacities can be re-positioned to emerge as leaders in clean technology in sectors like food security, clean energy and water resource management. Policy instruments, such as taxes, incentives and tradable permits can promote green investment and innovation. It requires government and business leaders to engage collaboratively through public-private partnerships. Central to this will also be the role of partnerships among developing countries. Unlike past industrial revolutions, the green economy will benefit from globalization, with large developing countries like China already taking a leading role in new clean technology market. With the right set of technology transfer and development policies at the global level, scope exists to expand south-south cooperation for a green economy.

Furthermore, the concept of a green economy is meant to achieve social equity, with the poor among the most benefitted by the shift to new clean technologies, enabling their rights to a healthy environment and access to sustainable resources for livelihoods. However, some of raised concerns that without sufficient attention and global measures to ensure global equity in the green economy, benefits of new technologies may register mainly to large corporations and developed country exporters.⁷⁶ Key to achieving equity in the green economy will be to engage potentials at the level of micro-economy to bring opportunities for technology transfer and development to small and medium sized enterprises and the informal sector, community entrepreneurs and social enterprise.⁷⁷ As noted further below, an opportunity exists to integrate new green technologies into poverty reduction strategies, as countries seek to expand access of the poor to food security, water supply and sustainable energy.

⁷⁶ Steve Bass, *National and regional dialogue on Green Economy – early findings*, Green Economy Coalition Presentation to the Poverty-Environment Partnership Meeting, Vienna, 17 Feb.2011, 3.

⁷⁷ Bass 2011:5.

Food Security at the Crossroads

Food security has returned to the top of the global agenda in 2011, with a resumption of high prices and social instability. In early 2011, the UN Food Price Index hit an all time high, with world grain prices having doubled since 2007. This is having serious consequences for health and welfare of the poor. Rising food prices “poses a threat to global food and nutrition security and creates a host of humanitarian, human rights, socio-economic, environmental, developmental, political and security-related challenges” endangering “millions of the world’s most vulnerable, and threatens to reverse critical gains made towards reducing poverty and hunger as outlined in the Millennium Development Goals.”⁷⁸ The access to food is a human right, with food unavailability first and foremost an issue attributable to poverty, with increasing incomes and increased access of developing country farmer to OECD markets the best way of combating food insecurity.⁷⁹ “Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe, and nutritious food which meets their dietary needs and food preferences for an active and healthy life.”⁸⁰

With growing populations and rising demands combined with increasing ecological pressures, many fear that food prices could well remain high into the future, unless measures are taken to minimize these risks to ensure affordability of basic food stuffs for the poor and near poor, and sustainability of farmers livelihoods, especially for small holder farmers. Studies have shown that agriculture sector GDP growth is twice as effective in poverty reduction from non-agriculture sectors.⁸¹ As noted in the 2010 Rural Poverty Report, out of the 1.4 billion people currently living in extreme poverty, more than two thirds of them reside in rural areas where agriculture provides a major source of livelihood for up to 80% of households.⁸² Thus efforts to green the agriculture economy can support both rising incomes for poverty reduction goals while also addressing issues of sustainability.

While record prices in 2007-08 subsided owing the temporary impacts of the recession on reduced consumption in late-2008 and 2009, the year 2010 saw a resumption of economic activity and demand for the world’s major grains - wheat, rice, corn, barley, oats, sorghum, rye and millet. Some see recent trends of upward price trends in late-2010 and early-2011 as evidence of a ‘new normal’ where the causes of food insecurity have shifted away from purely cyclical price surges driven by weather, now facing longer-term structural changes driven by a change to supply and demand fundamentals - a convergence of surging global demands from an ever-increasing population and bottlenecks to expansion of agricultural land and increased productivity such as climate change, rising energy costs, reduced groundwater irrigation capacities, desertification and reduced soil fertility.⁸³ “International agricultural commodities may be entering a period of sustained price volatility due to thickness of markets and limited stocks.”⁸⁴

On the demand side, the UN estimates that food production will need to increase 70% by 2050, with a 100% increase needed in developing countries.⁸⁵ Furthermore, the Director General of FAO notes that, “if we add the impact of droughts, floods, hurricanes and other events exacerbated by climate change and the speculation on agriculture commodity futures

⁷⁸ UN, *Comprehensive Framework of Action*, UN High Level Task Force on the Global Food Security Crisis, United Nations, New York (2008), ix.

⁷⁹ Olivier De Schutter, *Report submitted by the Special Rapporteur on the right to food*, UN Human Rights Council Sixteenth Session, A/HR/16/49, Dec.20, 2010, New York, 5.

⁸⁰ Rome Declaration on World Food Security, *World Food Summit, 13- 17 November 1996, Rome: Italy*.

⁸¹ World Bank, *World Development Report 2008: Agriculture for Development*, Washington DC (2007), 6.

⁸² IFAD, *Rural Poverty Report 2011*, IFAD, Rome (2010), 9.

⁸³ Lester Brown, *The New Geopolitics of Food*, May/June 2011, Earth Policy Institute, Washington D.C (2011), 1-2.

⁸⁴ World Bank, FAO and IFAD, 1.

⁸⁵ UN News Service, *UN Official Urges Greater Investment in Agriculture to Boost Food Security*, Mar.15, 2011, New York. (www.un.org/apps/news/printnews.asp?nid=37772).

markets, it becomes clear that the current situation is the chronicle of a disaster foretold.”⁸⁶ Exacerbating trends of food insecurity in 2010 were climate impacts on global food production, with record droughts in Russia and flooding in Pakistan and Australia in 2010. This was especially critical for wheat which is heavily dependent on rain-fed irrigation.

Trends of food insecurity have special consequences for social stability and sustainability of poverty reduction measures, with “the threat of unrest and political instability.”⁸⁷ “Of particular concern are countries engaged in delicate political transitions.”⁸⁸ The long-term structural factors driving global food insecurity is even more pronounced in the Arab region, with its high population growth rates and higher per capita consumption levels on the demand side, and small and shrinking levels of arable land and renewable water resources on the supply side in most Arab countries.⁸⁹ The Arab region is already the world’s largest net importer of cereal, more prone than other regions to global market fluctuations and global ecological change.⁹⁰ From 1990-2007 cereal yields increased only 14.5% in the region, while it rose 21.5% worldwide. The region has a net cereal import of approximately 58.2 million metric tonnes, with more than 50% of caloric intake already dependent on imports, 50% from wheat alone.⁹¹ The Arab region is the first region where grain production has peaked, and it has been projected that import dependence will increase a further 64% by 2030 if current trends continue, moving from 84 million metric tonnes in 2000 to 84 million metric tonnes by 2030.⁹²

Further with about 25% of the region’s population in poverty and 76% of the poor residing in rural areas, the region faces high risks of social instability from food crises. For example rural areas host 81% of the poor in Sudan, 80% in Yemen, 78% in Egypt, 75% in Tunisia and 67% in West Bank and Gaza.⁹³ Following the 2007-08 food shock, the Arab region witnessed an additional four million undernourished people⁹⁴. For example, during the 2008 food crisis it was found that in Yemen 10% of farmers consumed seed stocks reserved for the following year, sacrificing future productivity and income out of desperation, while 39% of households reduced their health expenditures.⁹⁵ Meanwhile rising food prices have a major impact on inflation, as the percent change in food inflation normally outpaces overall inflation in many Arab countries. Food security emerged as a key driver of Arab instability in 2011, with the combination of unemployment, surging food prices and inflation exacerbating calls for reform. Statistics showed well in advance of the 2011 events that an excessive proportion of household incomes in many Arab countries, more than 35% in countries like Tunisia and Egypt, were allocated to purchase of food items.⁹⁶ Furthermore, countries in the region face broader economic pressures resulting from rising food price increases, affecting trade and fiscal balances and thus sustainability of social safety net expansion programmes.

Climate change: impacts and vulnerability

Climate change stands as one the greatest threats to food security in the Arab region, with an additional 600 million people possibly at risk of hunger by 2080 as a direct result of

⁸⁶ United Press International, *UN Warns of Food Crisis*, Abu Dhabi, Mar.16, 2011 (www.upi.com/Science_News/Resource-Wars/2011/03/16/UN-warns-of-food-crisis)

⁸⁷ UN, *Comprehensive Framework of Action*, UN High Level Task Force on the Global Food Security Crisis, United Nations, New York (2008), ix.

⁸⁸ UN, *Comprehensive Framework of Action*, UN High Level Task Force on the Global Food Security Crisis, United Nations, New York (2008), 3.

⁸⁹ See Håkan Tropp and Anders Jägerskog, *Water Scarcity Challenges in the Middle East and North Africa*, Human Development Report Office: Occasional Paper 031, UNDP, New York (2006), 5.

⁹⁰ World Bank, *Improving Food Security in Arab Countries*, Washington DC (2009), xi.

⁹¹ World Bank, FAO and IFAD, xii-2.

⁹² World Bank, FAO and IFAD, 18.

⁹³ World Bank, FAO and IFAD, 12-13.

⁹⁴ World Bank, FAO and IFAD, xii.

⁹⁵ World Bank, FAO and IFAD, 12-14

⁹⁶ Subbaraman et al (2010), *Food Price Trends*, Nomura, Tokyo (2010), 5.

climate change risks.⁹⁷ Climate change is projected to exacerbate water scarcity and reduce agricultural productivity in many Arab countries. According to the IPCC Fourth Assessment Report, by 2080 agricultural output could fall by 9% in developing countries.⁹⁸ Agricultural yields, especially in rain-fed areas, are expected to fluctuate more widely over time and lead to lower long-term averages. Some estimate that for the Arab region as a whole, agricultural output could decrease 21% in value terms by 2080, with up to 40% decrease in parts of North Africa. North Africa is expected to see some of the worst impacts of climate change over the coming decades.⁹⁹ With countries like Yemen, Somalia, Comoros and Mauritania heavily dependent on subsistence agriculture climate change could lead to crop failures and in worst case scenarios could contribute to future events of malnutrition and famine.¹⁰⁰ In Yemen, for example, it is estimated that qat production accounts for 37% of all water used in irrigation.¹⁰¹ Climate change is also expected to accelerate desertification and reduce forest cover which also serves a vital role in supplementing farmer incomes in countries like Sudan and Yemen with high dependence on fuel wood for household energy needs.¹⁰²

Climate change is expected to affect volatility of global food prices as domestic production becomes less predictable, exacerbating social stability and conflict in many countries.¹⁰³ Year 2010 saw record temperatures and serious impacts of droughts on production of various crops affecting global prices. These types of events are expected to multiply as climate change takes on greater force during the course of the 21st century, with more frequent droughts and disasters expected to trigger speculation in commodity markets, "leading to price fluctuations far beyond what would be justified by decreased availability".¹⁰⁴ The nexus between climate change and food insecurity is complex and should become a key element of the emerging multidimensional view of poverty reduction.

Climate change affects four key element of food security - availability, access, utilization and stability.¹⁰⁵ With regards availability, climate change brings risks to availability of arable land and rural livelihoods through a decline in water, desertification, droughts and floods. With regard to access, climate change could result in increasing food prices and market volatility and increasing poverty in rural communities. Climate change also complicates issues of utilization, as it exacerbates pre-existing social competition over scarce resources and induces new conflicts within society. With regards stability, climate change could place new addition strains on social welfare and social safety nets. With regard to macro-vulnerabilities of food security, a need exists to analyze threats and impacts according to sectors including: agriculture; rural livelihoods; nutrition and health; and integration of climate adaptation with humanitarian response capacities to respond to droughts and famine risks. In particular, climate change will risk an expansion of the food insecure population. In order to free up fiscal space for adaptation programming, governments will need to shift from social safety nets that consist of price ceilings and subsidies to targeted social empowerment programs.

⁹⁷ UNDP, *2007 Human Development Report: Fighting Climate Change: Human Solidarity in a Divided World*, Palgrave Macmillan, New York (2007), 90.

⁹⁸ UNDP, *2007 Human Development Report: Fighting Climate Change: Human Solidarity in a Divided World*, Palgrave Macmillan, New York (2007), 15.

⁹⁹ Balgis Osman Elasha, *Mapping of Climate Change Threats and Human Development Impacts in the Arab Region*, Arab Human Development Report Paper Series, UNDP, New York. (2010), 14-15. See also Jon B. Alterman and Michael Dziuban, *Clear Gold: Water as a Strategic Resource in the Middle East*, Centre for Strategic and International Studies, Washington, D.C. (2010), 7.

¹⁰⁰ Osman-Elasha, 25.

¹⁰¹ G. Lichtenthæler, *Water Conflict and Cooperation in Yemen*, Middle East Report, 254 Spring Edition (2010), 30.

¹⁰² Balgis Osman Elasha. *Vulnerability of livelihoods to climate variability and change in the Arid and Semi arid areas*, Case study from Sudan. www.aiaccproject.org.

¹⁰³ Osman-Elasha, 25-27.

¹⁰⁴ UNDG, *Climate Change and Food Security in the Arab Region*, Regional UNDG, Cairo (Forthcoming), 1.

¹⁰⁵ *Ibid*, 2.

Policy responses: social policy and agricultural productivity

While increasing incomes and purchasing power of the poor remains the best way of combating food insecurity, more specific pro-poor strategies have been identified to enhance food security, including enhanced social safety nets and increased agricultural productivity which adapts to climate change.¹⁰⁶ Progress on food security is critical to achieving the right to adequate food and to development.¹⁰⁷ In terms of social security, improved education can reduce over-dependence on wheat and cereal for caloric intake, reducing dependence on imports while also improving nutrition and health. Social safety nets are also needed to buffer the poor from price shocks, with the poor in the region spending 35-65% of income on food.¹⁰⁸ As during the 2007-08 food crisis, some countries have increased public sector wages in response to recent events while others have and have increased bread subsidies.¹⁰⁹ Cash transfer programmes have also been a critical response, with Governments in some countries providing direct cash support to the poor to buffer rising costs of food and thereby minimize social instability. These targeted initiatives aimed at the poor are in addition to the sizeable food subsidies across the region, which remain the largest intervention by the state for food security by size of investment, albeit broadly applied rather than targeted to the poor. In Syria for example, in February 2011 the Government announced tax reductions on basic foodstuffs while allocating \$250million in aid to 420,000 poor households. This was seen as critical with the average family spending up to 50% of household income on food. Meanwhile in Kuwait, each citizen was granted a one-time cash transfer \$3,600 with 13 months of free food rations.

A special focus is needed on the youth in the region, making up the majority of national populations and lead social movements for change across the region. It is therefore particularly important to ensure continued access of poor youth to health and education services, with a risk of diversion of household resources from food expenditures to the health and education with a reduction of health and nutrition status, or a reduction of household allocations to health and education for other expenses resulting in a disinvestment in the youth of the region.¹¹⁰ Furthermore, the youth will also be critical in making advances in food security. As agriculture is already a major provider of employment for the youth of the world, a green economy approach to food security would also see an increased investment in young rural farmers, as a foundation for future Arab food security. As noted by the President of IFAD, "these young people are the next generation of farmers, producers and workers...Current events show the energy, creativity and power of young people, and also the importance of ensuring that they can see a future for themselves in the societies in which they live."¹¹¹

A second major means of enhancing food security is the expansion of public and private investments into agricultural productivity and adaptation to climate change. Social policy measures taken by governments will not be sustainable, especially in non-oil producing countries, owing to the broader affect of recent events on overall fiscal space, with budget deficits and declining revenues expected to continue throughout 2011.¹¹² In order to sustain expansion of social safety initiatives, countries would have to reduce spending on infrastructure and related budget items which could lead to negative impacts on the broader

¹⁰⁶ World Bank, *Improving Food Security in Arab Countries*, Washington DC (2009), xi. See also UN, *Comprehensive Framework of Action*, UN High Level Task Force on the Global Food Security Crisis, United Nations, New York (2008), x.

¹⁰⁷ Olivier De Schutter, 1.

¹⁰⁸ World Bank, FAO and IFAD, xi-xii.

¹⁰⁹ World Bank, FAO and IFAD, 10.

¹¹⁰ World Bank, FAO and IFAD, 23-24.

¹¹¹ UN News Service, *Investing in young people key to reducing rural poverty*, 19 Feb.2011, New York. (www.un.org/apps/news/printnewsAr.asp?nid=37573)

¹¹² Kinda Mohamadieh, Op. Cit. 6.

urban-industrial economy.¹¹³ Thus increasing investments into productivity is needed to get closer to root causes, in addition to managing the symptoms.

Following years of reduced investment in agriculture, foreign direct investment in the sector has increased in recent years, from \$600million annually in the 1990s to an average \$3 billion in the period 2005-2007.¹¹⁴ While expansion of farmland is unlikely owing to scarcity of land and water resources, productivity can be expected from gains in crop yield. Technological change played a key role in the green revolution of the past, with world grain yields having tripled since 1950. As we look to the future the potentials for new innovation and investment through the green economy concept can bring about another leap forward as the region seeks to overcome barriers. Some have estimated an average rate of return on agricultural investments in the region of 36%.¹¹⁵

Investments in drought resistant crops and improved water conservation can help farmers adapt to shifting climates, while investments in energy efficiency and renewable energy applications, reuse of agricultural waste, methane capture through biogas systems, enhancing soil carbon, expanding agro-forestry can provide a new source of finance as the post-2012 climate regime increases focus on access of the poor to carbon markets and a further alignment of carbon credits with the MDGs. A green economy approach supports a shift to ecologically sound approaches to increasing yields, while also addressing social equity. Special attention is needed to engage small and marginal farmers in this process, as large farmers will partly benefit from higher prices for their produce, while investments into small farmer productivity can have impact on reducing poverty while increasing food security. Broader measures include crop diversification, production of high-value organic produce for urban markets, reduction of persistent organic pollutants (POPs) from of fertilizer and pesticides, and replenishment of soil nutrients which are being leached at historic rates.¹¹⁶ Furthermore, this can help de-concentrate local markets which are often characterized by reliance on a few key producers and traders that control a large share of the market.¹¹⁷

Water is a key element of enhancing food security, with major need to invest in efficiency of water use in irrigation, which already accounts for majority of water use in most Arab countries.¹¹⁸ This is especially true given that groundwater reserves are in serious decline in many countries, while competition for water is increasing from urban-industrial centres. As noted further below, large water savings can be achieved by investing in water recovery and reuse, along with scope for investments into industrial wastewater treatment and reuse, and low-carbon means of seawater desalination.

Agro-ecology has also been highlighted as a mode of food production that can support improved productivity in an environmentally-friendly manner.¹¹⁹ Agro-ecology “seeks ways to enhance agricultural systems by mimicking natural processes...as a way to improve the resilience and sustainability of food systems.”¹²⁰ Resource-conserving, low-polluting approaches to food production are increasingly seen as a means of de-coupling crop yields from increasingly expensive energy, water and fertilizer inputs, and increasing yields without jeopardizing long-term quality and viability of increasingly scarce soils and water resources. Critical to enhanced food security will also be public and private investments into extension

¹¹³ Ibrahim Saif, 5.

¹¹⁴ Olivier De Schutter, *Report submitted by the Special Rapporteur on the right to food*, UN Human Rights Council Sixteenth Session, A/HR/16/49, Dec.20, 2010, New York, 3.

¹¹⁵ World Bank, FAO and IFAD, xii.

¹¹⁶ UNEP, 7.

¹¹⁷ Ibrahim Saif, *The Food Price Crisis in the Arab Countries: Short Term Responses to Lasting Challenge*, Carnegie Endowment for International Peace; Middle East Program Web Commentary (2008), 2.

¹¹⁸ Fareed Bushehri, *Green Economy in the Arab Region*, Presentation to UNEP Regional Workshop on Trade & Environment, Beirut, 15-16 December 2010, 3.

¹¹⁹ Olivier De Schutter, 1.

¹²⁰ Olivier De Schutter, 6.

services, rural infrastructure and access to markets, access to credit and insurance and support to farmer's organizations and cooperatives.¹²¹

Last but not least, in oil-rich countries in the Arab Peninsula, like Saudi Arabia and UAE, food insecurity is driving countries to aggressively explore investments in productivity through overseas land acquisition and leasing in Ethiopia, Indonesia, Sudan and Thailand.¹²² This is driven by high population growth in the Gulf, with populations expected to double from 2000 levels by 2030, in an environment of scarce arable land and groundwater resources. Globally this trend of land acquisitions for food security has topped 140 million acres bringing with it an investment potential of \$50 billion to host countries. However, this new trend has raised concerns over the impact on local communities in terms of land and water rights, and their own food security, with a need for investing companies to apply standards for socially responsible investment and corporate social responsibility. Furthermore, such initiatives are reactive and address the symptoms of food insecurity, rather than dealing with causes through more concerted efforts and investments within the Gulf itself to enhance local food, energy and water security.

A Clean Energy Revolution?

Towards a carbon shift

Energy has always been and continues to be at the centre of development. It lights our schools, powers our factories, fuels our mobility and cools our offices and homes. But as consumption and demand rise dramatically, largely driven by emerging economies like China and India, energy is becoming increasingly scarce with oil prices rising above \$100 per barrel in January 2011. This combined with rising food prices to exacerbate societal pressures in the lead up to movements that have swept across the Arab region. As noted by the latest IMF World Economic Outlook, "the persistent increase in oil prices over the past decade suggests that global oil markets have entered a period of increased scarcity. Given the rapid growth in oil demand in emerging market economies and a downshift in the trend growth of oil supply, a return to abundance is unlikely in the near term".¹²³

The convergence of declining energy reserves, dramatic rise in emerging economy demand and a gradual global shift to climate-friendly growth, have created a break from the type of cyclical factors that shaped the past, with oil prices likely to remain in the high range for some time to come; a 'new normal'. This holds risks for countries which seek to continue human development trends, with trends of human development traditionally tied closely to trends of per capita energy consumption. There is now recognition that rising prices could constrain economic growth unless energy alternatives are engaged, with the reality that we may have passed a threshold whereby such alternatives are becoming economically viable.¹²⁴

In addressing this historic shift, the UN recommends countries to commit themselves to two complimentary goals: to reduce the energy intensity of economic growth and to expand access to sustainable forms of energy for the poor.¹²⁵ Clean energy policies are now seen as a means of reducing dependence on increasingly expensive energy imports and thereby saving critical public resources for social development goals, while also creating the foundations for new growth and a green economy. The use of fossil fuels has also become a threat to the world's climate, representing 60% of total greenhouse gas emissions, so

¹²¹ Olivier De Schutter, 16.

¹²² Lester Brown, 4-7.

¹²³ IMF, WEO 2011.

¹²⁴ IMF, WEO 2011.

¹²⁵ UN 2010

progress on clean energy brings strong co-benefits for climate change mitigation. Emerging economies are taking leadership roles, with Asia emerging as a new centre of gravity for the clean energy economy.¹²⁶ Global clean energy investments in 2010 were 630% over 2004 levels, with overall investments, public and private, increasing to a record \$243 billion in 2010, of which solar energy accounted for 40% of the total. Of the total investments, \$82.2 billion was in Asia, with \$54.4 billion in China alone. China saw a steep rise in recent years moving from \$3 billion in private investments in clean energy in 2005 to \$39 billion of combined public and private investment.¹²⁷

In becoming the world superpower in clean energy, China has led the way in renewable energy, with its renewable energy economy now valued at U\$17 billion and employing 1 million workers, including 600,000 in solar thermal, 266,000 in biomass generation, 55,000 in solar photo-voltaic (PV) and 22,200 in wind power.¹²⁸ South Korea has also emerged as a leader, announcing a Green New Deal plan with \$36 billion of investments, or 3% of GDP and a goal of creating 960,000 new jobs.¹²⁹ This supports high-speed rail and urban transit, fuel efficient vehicles, energy conservation and eco-friendly buildings, all supporting new employment in these sectors. Such efforts not only help reduce dependence on energy imports and reduce carbon intensity of growth, but also catalyze the high-technology, knowledge-based economy of the future.

Coming to the Arab region, this serves as impetus to reorient the region's world-leading energy sector expertise, take advantage of its world leading solar radiation and wind resources and set the foundations for its future as a leader of clean energy expertise, technology and finance. The Arab region has succeeded over the past decades in achieving one of the world's fastest rates of improvement on human development indicators. However with many countries basing past development results heavily on oil-export revenues¹³⁰ and oil reserves facing gradual decline over coming decades in some countries, the sustainability of this model is now under review. The energy sector remains central the region's economy, making up approximately 40% of the regions total GDP and up to 60% of the world's oil reserves.¹³¹ But as reserves gradually decline, countries across the region are now intensifying efforts to diversify their economies beyond oil-exports, with rapid urban-industrial expansion meant to create new growth and jobs for a burgeoning youth population. Meanwhile, as urban-industrial expansion intensifies the region now hosts some of the highest per capita carbon emission levels in the developing world. It has been estimated that the region has experienced an 88% CO₂ emission growth rate (1990-2004), three times faster than the world average, despite hosting only 5% of the world's total emissions of greenhouse gases.¹³²

In response to drivers of energy security and climate change, countries around the region are now enacting new policies and actions plans to expand clean energy as a means of reducing energy intensity of growth, preserving scarce resources for future generations and doing their part in the fight against climate change. Globally, at least 85 countries have clean energy targets of various forms.¹³³ Development of new clean energy options also supports the rise of new high-tech industry, as an element of a future knowledge-based economy. Clean energy has emerged in recent times as a new source of growth and innovation rising to meet growing global demands for alternative energy. However, most clean energy options are yet to be fully integrated into national plans and policies, with increased attention by Governments in the region to enact new policies to expand use of clean energy and position

¹²⁶ Pew 2009.

¹²⁷ Pew 2009:13.

¹²⁸ Renner et al 2008.

¹²⁹ Barbier 2009.

¹³⁰ Pineda and Rodriguez 2010.

¹³¹ Abdel Gelil 2010.

¹³² Osman-Elasha 2010.

¹³³ Pew 2009: 6.

themselves for the green economy of the future.¹³⁴

Reducing the energy intensity of growth

Policy reform can support the process of market transformation to a clean energy economy, supporting broader transformation of industrial policy and removing policy and regulatory barriers that sustain fossil fuel use and hinder development of clean technology options. Examples include: enhancing regulatory policy frameworks, tariff structures and market incentives, stimulating business innovation and private sector participation, enhancing design and targeting of energy subsidies to remove barriers to expansion of clean technologies and phased introduction of low-emission technologies. Energy efficiency is seen as a particularly critical means to reducing energy intensity, with 'no regret' policies that can reduce energy intensity while also reducing costs of energy use.

Clean energy policies and regulations can provide positive measures and incentives. National targets for expansion of renewable energy and energy efficiency have been set in several Arab countries in recent years.¹³⁵ They also establish new institutions and regulatory agencies, along with service providers, financial institutions and research centres engaged in policy implementation. Meanwhile, clean energy policies and regulatory regimes can mandate clean technology assessments, roadmaps, action plans and legal frameworks for foreign investment and technology transfer. Technology needs assessment is an important starting point in this process, with Climate Change Mitigation Technology Needs Assessment methodology having been produced in recent years.¹³⁶ A total of five Arab countries have now undertaken TNAs including Comoros, Egypt, Jordan, Lebanon and Tunisia.¹³⁷ Efforts are underway in countries like Egypt, Lebanon and Saudi Arabia with new policies in recent years that incentivize more efficient energy use and removal of market barriers for increasing efficiency across sectors. A new series of UNDP/GEF supported programmes are also in process of being launched in the area of energy conservation, focused on energy efficient lighting in Egypt, green building codes in Syria and energy efficient consumer appliances in Jordan.

Key to commercialization of energy efficiency measures is the process of establishing new standards and certification systems for industry, consumer appliances and buildings for example that promote energy efficiency and renewable energy and reward compliance with economic incentives such as tax rebates. Algeria, Tunisia, Lebanon and Morocco for example have energy efficiency standards for consumer appliances along with targeted campaigns for retailer and consumers to green purchasing choices. Meanwhile a lack of standards for some products can impede their commercialization. For example in Egypt, lack of standards and certification systems for solar water heaters led to lack of quality in products and lack of consumer confidence, while great improvements can be made to increase energy efficiency standards for air conditioners and fridges which together makes up major proportion of household energy use and carbon emissions in the region. Custom import duties can also have a dampening effect on the ability of clean energy technologies to enter and compete, as market barriers to green trade and investments.

With the Arab region already hosting a high level of urbanization and facing a construction boom as a result of high oil export revenues, a particular focus should be integrating energy efficiency into new buildings. Many countries and private sector leaders are now engaged in making new buildings projects compliant with international green building standards, such as the Leadership in Environment, Energy and Design (LEED) standard. Central to the goal of

¹³⁴ UNEP 2011.

¹³⁵ Abdel Gelil 2010:10.

¹³⁶ UNFCCC 2007.

¹³⁷ Abdel Gelil 2010:18.

new green building efforts is to reduce the carbon footprint of buildings while also saving energy costs and helping achieve national goals of conserving energy resources. Particular progress has been marked in Egypt, Mauritania, Morocco and UAE while Saudi Arabia is also increasingly engaged in the green buildings process.¹³⁸ At the foundation of all such efforts is the design and enactment of government policies and regulations to mandate new building codes, market incentives for developers and tenants, standards for equipment and insulation, etc.

Buildings account for up to 40% of global energy consumption and up to 35% of world carbon dioxide emissions.¹³⁹ While a major source of emissions, the building sector also hosts the largest, most cost-effective opportunities for energy efficiency. In addition to insufficient access to finance and technology, inadequate policy and regulations also stand as a major barrier to progress. Mandatory and regulatory measures are seen as the “most cost-effective ways of increasing the energy efficiency of the building sector on a long-term basis”.¹⁴⁰ This includes mandatory green building codes, requirements for both supply-side and demand-side energy use in the life cycle of building construction and use, market-based approaches to engaging green finance and technology and synergy with green elements of broader urban and spatial planning policies.

Alternatives to mandatory building codes also exist where enforcement challenges exist. This includes for example mandating minimum energy-efficiency requirements for building components and equipment, easier to achieve than broad prescriptive building codes and a first step for transforming new or existing buildings. A focus on improved technology for building components and equipment is also seen often as a pragmatic policy response where the main challenge is renovation and upgrades to existing buildings. As a way of engaging support from the private sector, voluntary standards are another option allowing developers to opt for various grades of efficiency improvements and allowing for experimentation in crafting solutions to the unique challenges of cities and individual buildings.

The Arab region also holds great potential for solar and wind energy given natural endowment of strong solar radiation and wind currents. Developing a new clean energy sector can help save oil resources for export, while also supporting emergence of high-tech knowledge economy and new jobs for youth. Nevertheless the installed capacity of renewable energy in the region remains low, at about 7% of overall energy mix, largely from hydropower capacities in Egypt, Syria, Iraq, Lebanon, Sudan, Algeria, Morocco, Tunisia and Mauritania.¹⁴¹ Policies and regulatory frameworks are needed to integrate clean energy technology and competitiveness approaches across sectors. Multi-stakeholder processes are needed that facilitate public and private partnerships for finance and technology development and transfer.

The largest example of a solar technology use is in Morocco, where 160,000 solar home systems have been installed covering 8% of rural households with 16 megawatt (MW) capacity. Stand alone smaller-scale applications are also becoming prevalent across the region, such as water pumping, telecommunications and remote lighting. Another example is in Algeria, where a National Action Plan has been released to make clean energy rise to supply 5% of local energy demand by 2017 and a 20% share by 2030, in Tunisia where National Energy Programme seeks to achieve 13% of energy from renewable resources by 2011, in Morocco with its goal of 20% renewable energy share by 2012, in Jordan with a target of 10% renewable share by 2020 and Egypt where great attention has been placed in recent years to exploring the country's vast potential for solar and wind power with a goal of

¹³⁸Abdel Gelil 2010:16.

¹³⁹UNDP 2010.

¹⁴⁰Ibid.

¹⁴¹Abdel Gelil 2010:8.

20% renewable energy by 2020.¹⁴²

Renewable energy opportunities are also on the rise in the Gulf. The United Arab Emirates plans to establish Masdar City as a model in the region for the low-carbon city of the future, while the country has made progress in developing CDM initiatives for mobilizing foreign investments into new clean energy initiatives, including a new large-scale solar power facility, while Qatar moves ahead with plans for Energy City and Bahrain integrates clean energy into its World Trade Centre. In the Kingdom of Saudi Arabia, some estimate that out of the 10-12 million barrels per day produced in the Kingdom, the share of local demand will increase from 2.5mbpd today towards 8 mbpd by 2028.¹⁴³ Direct use of oil in the local economy has been increasing by 20% annually in recent years and new policy directions have been set to expand the share of renewable energy and energy conservation measures in the overall national energy mix.¹⁴⁴ Various new institutions have been launched as a result including in 2010 the King Abdullah City for Atomic and Renewable Energy (KACARE) and a new Solar Energy Research Centre in the King Abdullah University for Science and Technology (KAUST) and in 2009 a new Climate Change Centre for Excellence at King Abdul Aziz University (KAU).

An important example of future opportunity is the proposal for a pan-Arab solar network stretching across the region's deserts to capitalize on the region's world-leading levels of solar radiation. A private initiative led by EU investors, the Desertec project would generate 550 gigawatts (GW) of electricity up to 2050 and would service both local demands within Arab region as well as export markets in the EU by 2025.¹⁴⁵ Initial solar capacity would be hosted across North Africa, from Morocco to Egypt with possible expansion to the Arab Gulf and would be catalyzed by a proposed contribution of \$5 billion from the new Clean Technology Fund managed by the African Development Bank (AfDB) whose clean energy investment strategy focuses on energy security, energy access for the poor and carbon emission reductions.¹⁴⁶ A particular focus is on concentrated solar power (CSP), which is set to expand globally by a factor of ten times over the next five years.¹⁴⁷ CSP is one of the few renewable technologies with capacity for scaling up to fulfil significant proportions of energy demand, with a need for global financing, investments into research and development activities and adjustments to fossil fuel subsidies in order to jump start the use of CSP and move towards cost parity with fossil fuels in the future. Thus far, CSP projects have been proposed by Algeria, Egypt, Jordan, Libya, Morocco and Tunisia.¹⁴⁸

Meanwhile the Arab region successfully won the right to host the International Renewable Energy Agency (IRENA) in UAE, the first global agency to be hosted in the region. This holds the opportunity of bringing world leading policies and practices to the region's efforts. The Arab Regional Strategy for Sustainable Consumption and Production also calls for greater cooperation among Arab countries in areas of energy efficiency and renewable energy, with the new Regional Centre for Renewable Energy and Energy Efficiency in Cairo serving as one body that could help lead such an effort in the future. Large scope exists for technical cooperation among Arab countries to share expertise and resources among countries given the world-class energy facilities and expertise that exists in the region and can be directed towards the goal of a clean energy future.

In moving forward with clean energy policies whether in areas of energy efficiency, renewable energy or other areas in need of policy development, particular scope exists to make use of south-south cooperation in this process. With a base of clean energy policies in

¹⁴²AfDB 2009.

¹⁴³Yamani 2011.

¹⁴⁴MOEP 2010.

¹⁴⁵Abdel Gelil 2010: 9.

¹⁴⁶AfDB 2009.

¹⁴⁷IIASA 2009.

¹⁴⁸AfDB, 5.

several Arab countries, experiences and lessons in regulatory successes and failures can be critical as countries craft their own solutions. Lessons from these initiatives can be shared with other Arab countries seeking to expand clean energy policies, regulations and technologies. Key issues of common concern and action for which lessons can be shared include: energy subsidy reform, solar power feed-in-tariffs and PV technology development, incentives for technology transfer and foreign investment including through venture capital and end-use efficiency policies for industry, consumer appliances and buildings.

A new generation of national clean energy policies and plans can build on the energy sector expertise and resources in the region and support new technology development for application across the region. At the national level, capacities need to be strengthened in clean energy policy formulation, in the proper targeting of measures like energy subsidy reform and providing an enabling environment for private sector investment in the transition to low-emission pathways. Also critical at the base of clean energy sector development is the need for intellectual property rights to support effective transfer and development of new clean energy technologies, as with other components of the new knowledge economy.

Regulatory regimes can help overcome several policy barriers in both demand side and supply side of the equation. Specific examples include increasing end-use energy efficiency in industry, transport, appliances and buildings, increasing efficiency of power supply stations and transmission systems and measures to support a shift to renewable energy based power generation such as feed-in-tariff provisions like those in Algeria's renewable energy policy. Regulatory regimes also serve to catalyze more market based approaches to energy use and public-private partnerships, shifting from fossil fuel monopolies to a more open market of competition, by shifting subsidies to traditional energy, supporting new subsidies to alternative energy and financing research and innovation through which alternative energy solutions emerge and become commercialized. New policies can also reform the systems of energy subsidies that have created a competitive advantage for fossil fuels over clean energy options. While current high oil prices help to make alternatives more attractive, this does not apply as much to oil-poor countries in the Arab region which are the majority of Arab countries. Market incentives are a key benefit of clean energy policies and regulatory frameworks, setting an enabling environment for rise of market opportunities and new foreign and domestic direct investments.¹⁴⁹

Access to energy for the poor

As noted by the UN Secretary-General's Advisory Group on Energy and Climate Change (AGECC), opportunities exist to find synergies between new clean energy policies and poverty reduction through expanding access of the poor and "create a predictable, long-term policy environment for investment and a roadmap for accelerating the establishment of the required human and institutional capacity and delivery mechanisms".¹⁵⁰ As further noted at the recent MDG+10 Summit in September 2010, "lack of access to modern energy services is a serious hindrance to economic and social development and must be overcome if the UN Millennium Development Goals (MDGs) are to be achieved. Access to modern forms of energy is essential for the provision of clean water, sanitation and healthcare and provides great benefits to development through the provision of reliable and efficient lighting, heating, cooking, mechanical power and transport".¹⁵¹

Actions include: enhancing regulatory policy frameworks, including tariff structures and market regimes, to stimulate business innovation and private sector participation; enhancing the design and targeting of energy subsidies to remove barriers to expansion of clean

¹⁴⁹ Ibid.

¹⁵⁰ UN 2010.

¹⁵¹ IEA and UN 2010.

energy technologies; and phased introduction of low-carbon technologies and energy efficiency measures. Many countries have commenced such policies and actions but greater capacities are needed in the region to design, implement and scale-up such initiatives need support for technical, institutional and policy aspects of the challenge. A new generation of national clean energy plans can build on the energy sector expertise and resources in the region and support new technology development for application in the region and abroad.

This is particularly important in the Arab region, where approximately 40% of the poor do not have adequate access to energy services.¹⁵² Unless issues of social equity and balance between urban and rural opportunities are addressed within policy and regulatory frameworks, chances are that most clean energy innovations and benefits will bypass the poor and vulnerable communities who can benefit most from access to modern, low-cost and low-polluting energy sources. In 2008, leaders meeting in Saudi Arabia enacted the Riyadh Declaration on Energy for Sustainable Development, focused on expanding energy access for the poor. This is especially important in countries like Sudan, Yemen and Egypt where a significant proportion of the population falls below the poverty line and lacks access to sustainable forms of energy. In Sudan and Yemen for example electrification rates are as low as 25%.

To help implementation of the Riyadh Declaration, the OPEC Fund for International Development (OFID) has committed \$1billion to support energy access in least-developed countries around the world, including within the Arab region. For rural energy access programmes, upfront long-term public investment is essential to developing the various functional capacities needed to scale-up energy access to the step where market transformation can occur. At the national level, capacities need to be strengthened in clean energy policy formulation, in the proper targeting and reform of energy subsidies and in providing a more enabling environment for investment. In Algeria for example, the Government has enacted a plan for expanding access to clean energy for the poor with a stated goal for clean energy to make up 6% of overall energy demand by 2015. Furthermore, countries can engage carbon markets for expanding energy access for the poor. The UN sponsored Clean Development Mechanism (CDM) is one example, with Egypt, Jordan, Morocco, Tunisia and UAE having developed clean energy projects in recent years. While only hosting 1.5% of global CDM portfolio up to 2012, scope exists to direct future CDM investments to clean energy projects that benefit poor rural communities, a key focus for emerging post-2012 global climate change frameworks.

Overcoming Water Security

“By means of water, we give life to everything” reads a passage in the Koran. The centrality of water to life is deeply rooted in Arab culture and assumes a central place in political and social debates. Water is recognized as a basic necessity for life and is indispensable for a range of human development factors such as food security, health and sanitation, energy and industry. “When people are denied access to clean water”...“their range of choices and freedoms are constrained by ill health, poverty and vulnerability. Water gives life to everything, including human development and human freedom.”¹⁵³ For thousands of years water has been expanding in the Arab region as a result of human ingenuity and engineering of water resources. However, the region now faces an age of scarcity, where access to water will be defined by political, social and economic adjustment, with hopes arising from both the expansion of market-based approaches and the democratic transition underway in some countries in the region.¹⁵⁴

¹⁵² Abdel Geilil 2010:8.

¹⁵³ UNDP, *Human Development Report 2006*, Palgrave McMillan, (2006) New York, 2.

¹⁵⁴ Middle East Institute, 39.

Many countries in the region are well on the way to achieving the MDG target to “halve by 2015 the proportion of people without sustainable access to improved drinking water and basic sanitation” relative to 1990 levels.¹⁵⁵ However, more than 45 million people in the Arab world still lack access to clean water or safe sanitation.¹⁵⁶ Meanwhile, water scarcity is expected to increase owing rising population, climate impacts and declining water reserves. This brings challenges to sustainability of human development results and ensuring equitable and efficient allocation of water among increasingly competitive users in residential, agriculture and industry sectors. Special measures are needed to ensure that the poor do not bear a disproportionate share of the impact of increasing water scarcity.

The Arab region is the most water-scarce region in the world, and the importance of water for human life and combating poverty cannot be overstated. Globally, the OECD defines water stress as severe when ratio of total water use to renewable supply exceeds 40%, with nearly half of the world's population being in severe water stress by 2030 if current trends continue.¹⁵⁷ This is driven by several factors including rising population, increase per capita consumption, decline of water resources and increased water pollution, broader ecological changes to watersheds, and climate change.¹⁵⁸ The 2030 Water Resource Group further predicts that unless efficiency of water use increases by 20% by 2030, demand could overshoot supply by 40%.¹⁵⁹

According to the 2009 Arab Human Development Report, available surface water resources in the region are estimated at 277 billion cubic meters (Bcm) per year, with only 43% of that originating within the region itself, making the Arab region the most dependent on external sources of water.¹⁶⁰ Meanwhile, water demand in the region is expected to increase by 85 Bcm by 2030, representing a 47% increase from 2005.¹⁶¹ Increasingly, the region is dependent on ‘virtual water’ largely based on the import of food products which rely on the water inputs in exporting countries, with the Middle East region having a net virtual water import of 47 Gcm per year.¹⁶² The region has only 1,110m³ of renewable water per person per year (2007) far below world average of 6,617m³, while water problems cost the region between 0.5-2.5% of GDP per year.¹⁶³ Furthermore, out of the 22 countries in the world below the water poverty line, 15 of these are in the Arab region with a 37-53% rate of efficiency in use of water across sectors in the region.

Available renewable water resources per capita in the Arab world are among the lowest in the world. According to the FAO the total available water resources in the Arab region amount to about 313.2 km³/year corresponding to 1047 m³/person/year. Actual water withdrawal in the region is about 182.8 km³/year representing 58.4% of total available water and corresponds to per capita share of 611 m³/person/year. Of these withdrawals the agricultural sector consumes the lion's share (89%), while domestic water use and industry are allocated 6% and 5% respectively.¹⁶⁴ The greatest proportion of these resources (54%) stems from external water inflow while the rest is subdivided between renewable internal surface water (40%) and ground water (6%) with an overlap of resources amounting to 21.6 km³/year. Underground water reserves in the Arab region are estimated at 7,734 Bcm.¹⁶⁵

¹⁵⁵ WHO/UNICEF, *Progress on Sanitation and Drinking Water: 2010 Update*, WHO Geneva, (2010).

¹⁵⁶ UNDP, *Arab Human Development Report 2009: Challenges to Human Security in the Arab Countries*. United Nations Development Program, New York: (2009).

¹⁵⁷ OECD, *Managing Water for All: An OECD perspective on pricing and financing*, OECD Paris, (2009).

¹⁵⁸ UNEP, *Water: Investing in Natural Capital*, in *Towards a Green Economy*, UNEP, Nairobi (2011), 129.

¹⁵⁹ 2030 Water Resources Group, *Charting our water future: Economic frameworks to inform decision making*, McKinsey and Company, Munich (2009).

¹⁶⁰ UNDP, *Arab Human Development Report 2009*, Palgrave MacMillan, (2009) New York, 37.

¹⁶¹ 2030 Water Resources Group.

¹⁶² Chapagain A.K. and Hoekstra A.Y., *The global component of freshwater resource demand and supply: an assessment of virtual water flows as a result of trade in agricultural and industrial products*, *Water International*, 33(1):19-32, (2008).

¹⁶³ Middle East Institute, 13.

¹⁶⁴ CEDARE and Arab Water Council, *Status of Water MDGs Achievement in the Arab Region*, Cairo (2007), 6.

¹⁶⁵ UNDP, *Arab Human Development Report 2009*, Palgrave MacMillan, (2009) New York, 37.

Serious levels of water stress exist in Iraq, the Occupied Palestinian Territories and Yemen, while significant stress also exists in Jordan and Saudi Arabia.¹⁶⁶ The number of countries facing significant stress or serious water stress is expected to increase into the future owing to convergence of growing populations, impacts of climate change and decline of renewable water reserves. In Yemen, already holding one of the lowest freshwater availability rates in the world (198 cm per person), per capita water availability is expected to fall by one third as the population doubles by 2025.¹⁶⁷ Around the capital Sana'a aquifer extraction rates are 250% recharge rates, while national average groundwater extraction already exceeded recharge in the mid-1990s. Two thirds of water in Sana'a is now supplied by private sources.

In the Occupied Palestinian Territories (OPT), Palestinians have access to only 320 cubic meters per person per year, one of the highest levels of water scarcity in the world, owing to both physical scarcity and political factors, including asymmetry of power between Israel and OPT which share a common aquifer.¹⁶⁸ Palestinians lack access rights to the Jordan River, leaving them fully dependent on limited and dwindling groundwater resources. Further, with OPT, Israeli settlers use 1,000 cubic meters per person per year in Gaza and over 600 in West Bank, compared to less than 100 cubic meters per person per year. This is partly the result of discriminatory policies, whereby settlers have rights to develop deeper wells. Limited access to water also holds back agriculture and other development activities among Palestinians, while lack of access to energy and power supply also brings barriers to water use which is heavily energy dependent for pumping and distribution.

Over three-quarters of the region's water resources are already being withdrawn for human use and climate change will exacerbate this challenge.¹⁶⁹ Some predict that the Euphrates and Jordan Rivers could shrink by 30% and 80% respectively by the end of the century.¹⁷⁰ In Sudan, more intense droughts and reduced wet seasons could impact the upper reaches of Nile, leading to water shortages and consequences for agriculture in downstream countries.¹⁷¹ Based on projections, the region's water deficit could increase from about 28.3Bcm in 2000 to 75.4Bcm in 2030 due to a combination of factors including increased temperatures, reduced precipitation and melting of snowcaps in the watersheds across the region.¹⁷² This includes projections for example of reduced snow cover from 170,000 km² to 33,000 km² in the watersheds that feed the Euphrates and Tigris rivers should a 5°C temperature increase prevail, with potential for 40% water discharge reduction. Meanwhile, temperature increases of 2°C-4°C in Jordan would reduce the flow of the Azraq River by 12-40%.¹⁷³

Expected water use in the region in the twenty first century depends on two main factors: the already existing and well documented overall water scarcity and the rapid population growth. Speaking in terms of water needs equivalency and in accordance with the currently prevailing rates of water withdrawal in the region, this means that the countries of the region would have to increase their water supply by about 4.6 km³/year.¹⁷⁴ In fact water per capita share will systematically decline from the current level of 1047 m³/year to reach 674 m³/year by 2025 and continue to slump to an alarming 476 m³/year in 2050.¹⁷⁵ Of central

¹⁶⁶ Middle East Institute, 20-22.

¹⁶⁷ UNDP, *Human Development Report 2006*, Palgrave MacMillan, (2006) New York, 144.

¹⁶⁸ UNDP, *Human Development Report 2006*, Palgrave MacMillan, (2006) New York, 216.

¹⁶⁹ Abahussain *et al*, *Desertification in the Arab Region: analysis of current status and trends*, Journal of Arid Environments. Volume 51, (2002), 521-545.

¹⁷⁰ Osman-Elasha, 24.

¹⁷¹ UNFCCC, *Background paper for the African Workshop on Adaptation*, UNFCCC, Bonn (2006).

¹⁷² Smith *et al*, *Hydrologic Trends in the Middle East: Modeling and Remote Sensing*, Yale University, E. DePauw, ICARDA (2000).

¹⁷³ Abdulla and Al-Omari, *Impact of Climate Change on the Monthly Run-off Of Semi-Arid Catchments: Case Study Zarqa River Basin, Jordan*, Journal of Applied Biological Sciences. (2008)

¹⁷⁴ CEDARE and Arab Water Council, Op. Cit. 7

¹⁷⁵ Ibid, 8.

importance to the understanding of water conditions in the Arab countries and their interrelationship with poverty is the concept of national water footprint. The water footprint of a country is defined as the total volume of fresh water that is used to produce the foods and services consumed by the inhabitants of the country. A water footprint is generally expressed in terms of the volume of water use per year.¹⁷⁶ Defining water scarcity as the ratio of the total water footprint of a country to the total renewable water resources¹⁷⁷ and speaking in water quantities terms, almost all Arab countries suffer from excessive water scarcity.¹⁷⁸

Unequal access to improved drinking water prevails with 96% of urban areas supplied with adequate water services compared to 87% in rural counterparts.¹⁷⁹ Meanwhile many cities face serious leakage issues, wasting otherwise precious water needed for agricultural livelihoods and food security in rural areas. The total domestic water supply is presently estimated at about 16.7 km³ and is expected to rise to 27.6 km³ in the year 2025, which means that about 11 km³ or only 7% of the present consumption of water in the agriculture sector (146 km³) would be needed to satisfy the growing domestic water needs over the coming 20 years.¹⁸⁰ When the poor do have access, the installation often has to be shared among a greater number of people.¹⁸¹ The poor in many Arab cities pay high prices for water supply, more than those paid by more affluent households connected to the piped system. Furthermore, many utilities in the region practice intermittent supply in which they deliver water to various parts of the city for a fixed number of days on a scheduled basis.

In the agriculture sector, where the majority of the poor reside, irrigation water subsidies have been justified on the grounds that they provide protection of the poor. However, newly accumulated data reveals that the poor in the agrarian sector, like their counterparts in urban centers, do not necessarily benefit from such policies. In Egypt, 75% of the water subsidy benefits the richest 50% of households, whereas only 25% benefits the poorest 50%. Only 9.7% of the total public subsidy is received by the poorest 25% of households. These findings indicate that irrigation subsidies are not justified as a policy instrument for the redistribution of income. The main beneficiaries of subsidies are the rich, not the poor.¹⁸² Social protection policies could allow Arab countries to change agricultural and water policies while minimizing the impact on poor communities.

Specifically designed social protection policies could shield low-income rural households from the distributional effects of opening up rural economies to international markets and from changes in agricultural water policy. Greater accountability would also improve the efficiency of this form of social spending. Today, approximately 85% of all surface water and groundwater in Arab countries is already used for irrigation. However, considerable variations between countries exist, where the percent of annual irrigated land is as high as 100% and 97% in Djibouti and Egypt respectively, and as low as 10% or less in Algeria, Mauritania, Morocco, Sudan and Tunisia while Iraq, Jordan and Syria annually irrigating about one third of agricultural land.¹⁸³

¹⁷⁶ Ibid, Vol. 1.

¹⁷⁷ Ibid, Vol. 2, Appendix XXIII: 1

¹⁷⁸ The World Bank, *Making the Most of Scarcity: Accountability for Better Water Management in the Middle East and North Africa*. Washington D. C. (2007): 33-57.

¹⁷⁹ Ibid, 22.

¹⁸⁰ Arab Water Council, *Regional Report to the 5th World Water Forum*. Istanbul: 8

¹⁸¹ Barghouti, S. Op. Cit.

¹⁸² Mohamed, A. S; Kremer, A; and Kumar, M. *Assessing the Efficiency and Equity of Water Subsidies: Spending Less for Better Services*. In N. Vijay Jagannathan, Ahmed Shawky Mohamed and Alexander Kremer (Eds.). Op. Cit. 68

¹⁸³ The World Bank, FAO and IFAD. *Improving Food Security in Arab Countries*. The World Bank, Wash. D. C.: (2009). 35

Water Governance for a Green Economy

Improving water governance is a central feature to improve water security in the Arab region, and seen by many as the greatest impediment to catalyzing green investments into the sector.¹⁸⁴ It is a central pillar of efforts to achieve a green economy, and seen as one of the most cost effective means of address water security issues.¹⁸⁵ Development returns on investments can be significant, with positive benefits to overall economic growth and human development trends.¹⁸⁶ One of the largest challenges to improve water security and achieve a green economy in the region will be to increase both the productivity of water use and the effective institutional governance of water resources, so that water can be adequately shared across concurrent increases in demand from urban, agricultural and industrial expansion. “The best results come from the pursuit of mixed solutions. Simple single-shot solutions tend to be prohibitively expensive, and in many cases, are insufficient to solve known supply problems.”¹⁸⁷

To prevent continued increases in the gaps between water supply and demand, major gains in water productivity are needed, including technology investments, policy reform and improved institutions. Key issues will be increased productivity of water use in the agriculture sector, more efficiency use of water and improved treatment of waste water from industry, removal of policies that encourage water use, and innovative use of ecosystem approaches and market based instruments such as Payment for Ecosystem Services.¹⁸⁸ Through green economy approaches like more efficient technology, water recycling and reuse, leakage reduction, opportunities have arisen to make water more available while also increasing cost efficiency. While many countries have invested historically in large projects such as dams, significant benefits can come for equity and sustainability from smaller scale locally tailored systems, such as micro-hydro dams, stormwater capture, water recycling, etc.¹⁸⁹

With dwindling renewable water resources, a key priority is to focus on the broader ecosystems in which water resources exist. As noted in the process of The Economics of Ecosystems and Biodiversity (TEEB) initiative, this includes upland mountain ecosystems, as well as the sustainable use or restoration of ecosystems like wetlands, marshlands and coastal areas that play key roles in the water cycle and provide rural livelihoods.¹⁹⁰ There is an increasing convergence between declining water resources and broader ecosystem decline, with a significant overlap between areas of water insecurity and areas of biodiversity loss.¹⁹¹ Watersheds that serve water generation and water treatment functions need to be protected, as land use has a significant impact on levels of run-off, water availability and water quality.¹⁹²

Scope also exists for restoration of degraded ecosystems. An example of this is in Iraq, where the famous marshlands in the south of the country have been successfully regenerated after years of decline for the benefit of water resources and the ecological functions which they historically served including livelihoods of the 'marsh Arabs' (Ma'den).

¹⁸⁴ Hakan Tropp, *Making water a part of economic development: The economic benefits of improved water management and services*, Stockholm International Water Institute, Stockholm (2010). See also Global Water Partnership, *Triggering change in water policies*, Global Water Partnership, Washington (2009).

¹⁸⁵ Menard C. and Saleth R.M., *The effectiveness of alternative water governance* (2010), cited in UNEP (2011).

¹⁸⁶ Sachs J.D. *Macroeconomics and health: Investing in health for economic development*. Report of the Commission on Macroeconomics and Health, Earth Institute, New York (2001).

¹⁸⁷ 2030 Water Working Group.

¹⁸⁸ UNEP, *Water: Investing in Natural Capital*, in *Towards a Green Economy*, UNEP, Nairobi (2011), 119-121.

¹⁸⁹ Schreiner B., Pegram G, von der Heyden C and Eaglin F, *Opportunities and constraints to development of water resources infrastructure in Sub-Saharan Africa*, (2010), cited in UNEP (2011).

¹⁹⁰ Khan S, *The costs and benefits of investing in ecosystem services for water supply and food production*, cited in UNEP (2011).

¹⁹¹ Vorosmarty, C.J. et al, *Global threats to human water security and river biodiversity*, *Nature* 467: 556-561.

¹⁹² Young M. and McColl J., *A robust framework for the allocation of water in an ever-changing world*, Chapter 5 in Bjornlund H (Eds) *Incentives and Instruments for Sustainable Irrigation*, WIT Press, Southampton, UK (2010).

Thought to be the location of the Garden of Eden and the birthplace of Abraham, the wetlands of southern Iraq were the third largest wetlands in the world until the early 1980's after which the area was drained and destroyed as part of a campaign by the Government against the local minority community.¹⁹³ A multi-year UN supported programme has now helped to regenerate the wetlands.¹⁹⁴

Another key challenge is to find appropriate means of pricing water and putting in place incentives for sustainable use of water resources. Three general means have been used by countries around the world for financing water supply, tariffs based on usage rates, allocation of public tax revenues to subsidize water provision, and transfer payments including international grants.¹⁹⁵ In the Arab region, most water services are based on the use of public resources through taxation and other means. In Cairo for example, about 90% of water sector financing comes from public resources, reflecting the commitment of the State to ensure water as a public right. This however, does not necessarily reflect scarcity or future risks such as climate change into the calculus, with lack of incentives for more efficient uses of water resources.

Water management in the Arab region is also confronted with challenges in institutional decentralization, integrated water resources management and stakeholder participation. Since a decade and a half or two decades concerted efforts have been made to decentralize water management have been expanding in a number of the Arab countries. In Yemen, for example, there has been a gradual evolution from a focus on infrastructural development to management and institutional development, capacity building and participation of the private sector in water management.¹⁹⁶ Since the turn of the century, Yemen established separate regional entities at the governorate level to manage water supply and sanitation. In Morocco, the Water Supply Programme for Rural Population in Morocco (PAGER) is an example of how Governments are engaging social empowerment as a tool for increasing water security.¹⁹⁷ In the mid-1990s, a serious gap existed between rural and urban access to water, with 10% access in rural areas versus 90% in cities. This was accompanied by prevalence of disease among rural communities relying on unprotected water sources, and burden on women and children in terms of water collection.

Through PAGER, management of infrastructure was decentralized to local communities, with increase to 50% rural access by 2005, with concomitant increases in health and education status of the poor. In Egypt, agencies for water supply and sanitation were integrated into one authority acting as a holding company under which several regional companies are currently responsible for that matter. Syria has also established independent water directorates at the basin level to promote decentralization and has decentralized responsibility for water supply and sanitation to water authorities and municipalities.¹⁹⁸ Tunisia and Lebanon have split responsibility for water management along administrative rather than watershed borders, with 23 financially autonomous public provincial offices in Tunisia, and 22 regional water authorities in Lebanon.¹⁹⁹

Several countries of the region paid concerted efforts to decentralize the responsibilities of irrigation water management through the establishment of water user associations (WUAs). The ultimate goal is to increase and improve water use efficiency and management practices and reduce government finance of irrigation infrastructure operation and maintenance cost. Such projects usually involve a combination of technical changes and infrastructure investment, together with institutional and organisational changes in the way

¹⁹³ Human Rights Watch, *Iraqi Government Assault on the Marsh Arabs*, Briefing Paper, New York (2003), 5.

¹⁹⁴ UNEP, *World heritage push for the Garden of Eden*, Press Release, Sept.5, 2008, Nairobi.

¹⁹⁵ OECD (2009)

¹⁹⁶ 4th World Water Forum, Op. Cit. 10

¹⁹⁷ UNDP, *Human Development Report 2006*, Palgrave MacMillan, (2006) New York, 105.

¹⁹⁸ Ibid.

¹⁹⁹ The World Bank, Op. Cit. (2007): 44

irrigation water is managed. Egypt has been utilizing WUAs that manage local infrastructure as well as larger scale canals (that is, at the tertiary, secondary, and district levels).²⁰⁰ In Yemen, participatory regulatory systems have helped improve irrigation services. Water saving technologies and regulatory systems were designed in consultation with users to ensure that the technologies meet farmers' needs and that regulatory systems are equitable. A high degree of beneficiary ownership and the existing financial arrangements give farmers an incentive to maintain the modern irrigation equipment and replace it after the end of its economic life.²⁰¹

Another important change in Arab water service provision in the last decade has been the increasing role of market based approaches and the private sector. Research in recent years has shown that in some contexts, public-private partnerships can achieve improved quality of service and efficiency while increasing cost effectiveness.²⁰² Many companies have now commenced integrating water security issues into their internal policies, including calculation of their water footprints and the water related risks they face.²⁰³ The drivers to private sector participation are varied. They include the inability of governments to raise adequate capital to finance, operate and maintain the required updates and development of water supply and sanitation infrastructure. There has also been the belief that management and technical experience, structures and practices within the private sector would lead to more efficient provision than from government-run providers.²⁰⁴

Examples of effective water markets for tradable water entitlements can be seen in Australia where market based approaches have been explored owing to increasing concerns over water security, recurrent droughts and rising competition from various sectors, including purchase of entitlements by conservation organizations.²⁰⁵ Meanwhile, governments in UAE, Algeria, Jordan and Morocco, for example, have moved away from being the direct providers of water services into a more strategic and regulatory position. Recent moves in UAE, Lebanon and Saudi Arabia illustrate that public-private partnerships is developing under many different existing models of provision.

In countries such as Tunisia, a centralized public-sector-funded system is in place, with moderate private-sector participation recently introduced through build operate and transfer (BOT) contracts, with private-sector financing playing a greater part in irrigation management.²⁰⁶ In Egypt, for example, the West Delta Water Conservation and Irrigation Rehabilitation Project is a recent example where a conveyance system is under development to bring Nile water to an area suffering from groundwater depletion, through private sector financing. This water will support the activities of commercial farmers who in return, and following important reforms to the sector by the Government of Egypt, will pay for the full cost of the service.²⁰⁷ Today, Morocco's experience of privatizing 30% of its urban water and launching privatized irrigation schemes in southern and northern Morocco are worthy of lessons learned.²⁰⁸

Many Arab countries suffer from inadequate policies and institutions. Khordagui identifies causes for low levels of accountability, including availability and validity of basic data; and

²⁰⁰ Mohieddin, M. *Water Conflicts and Conflict Management in Egypt*. CEDARE, Cairo: (2005).

²⁰¹ The World Bank, Op. Cit. (2007): 44

²⁰² UNEP (2011), 147.

²⁰³ United Nations, *UN CEO Water Mandate: Framework for responsible business engagement with water policy*, UN Global Compact Office, New York (2010).

²⁰⁴ Thompson, J. *Private sector participation in the water sector: Can it meet social and environmental needs? International Institute for Environment and Development WSSD Briefing Papers*, <http://www.iied.org/pubs/pdf>.

²⁰⁵ Bjornlund H. and Rossini P, *An analysis of the returns from an investment in water entitlements in Australia*, Pacific Rim Property Research Journal 13(3):344-360. (2007).

²⁰⁶ Arab Water Council, *Report to the 5th World Water Forum*, Istanbul: March (2009): 14.

²⁰⁷ Ibid.

²⁰⁸ 5th World Water Forum, Op. Cit. 24.

the reliance of the political regimes on use and control of the environment.²⁰⁹ But owing to increasingly competitive water demands, with increase scarcity of supply, over past several years many Arab countries are making progress in reforming of water policies, institutions and legal frameworks.²¹⁰ In some Arab countries, NGOs have also been granted a larger role in water governance. Egypt, Jordan, Morocco, Tunisia, and West Bank and Gaza have developed water policies and strategies based on stakeholder consultations including government officials, politicians, water user associations and local communities.²¹¹ Governments have also begun important outreach programs and public awareness campaigns.

Increasing attention is also needed to the convergence of water security and energy. Water distribution is highly energy intensive, with pumping costs often a key bottleneck to expanded efficiency of water supply for irrigation, residential or industrial uses. In the Arab region, countries one of the ways countries have attempted to overcoming freshwater scarcity is to expand production of seawater desalination.²¹² The region now has 60% of the world's desalination capacity and has been using this technology to supply more than half of all municipal water needs since 1990, producing 2,377 million m³/year.²¹³ Saudi Arabia, UAE and Kuwait, are the largest producers and users of desalinated water with 77% of regional capacity, with Saudi Arabia alone accounting for 41%. Much of this is co-generation with power supply, with energy intensive oil-power facilities also serving to desalinate water. Other Arab countries such as Algeria, Tunisia, Libya and Jordan have desalination facilities and are planning to to construct new ones to increase their desalination capacities. These trends have led to a large and growing footprint for desalination plants in the region, with new research and investment needed into energy efficiency means of desalination, to prevent exacerbation of energy reserve decline. Indeed some estimate that water desalination could be the largest source of new energy intensity growth and emission in coming decades unless measures are now taken.

Summary

- While achieving some of the world's fastest rates of progress on human development indicators over the past decades, the region also faces decreased ecological capacities. Growing ecological deficits, as in the case of food, energy and water, could have serious consequences, exacerbating challenges to sustaining hard-won development results. Particular attention is needed to the poor who rely on natural resources for their livelihood and are disproportionately impacted by environmental degradation. Rather than hindering development, environmental sustainability can strengthen resilience of the natural asset base on which the poor depend while reducing the impacts of ecological change.
- Climate change presents a common threat to sustainability of natural resources and the environment across the region. The Arab region could see temperatures rise of 2°C by 2030 and 4°C by 2100, with reduced water run-off by 20-30% by 2050. North Africa could face particularly serious impacts from these trends. The Arab region already holds the world's highest levels of food import dependency, its lowest levels of water security and increasing rates of oil depletion, all of which threaten sustainability of development.
- The discourse on environmental sustainability in the region has traditionally focused largely on issues of production and consumption. While this remains central to addressing emerging challenges of resource scarcity and pollution, an equally critical perspective is

²⁰⁹ Khordagui, H. *Water Governance Priorities in Arab States: Between Drought and Flooding*; Presented to the Arab Climate Resilience Initiative Roundtable, Alexandria, 31 March 2010.

²¹⁰ Abdel Dayem, S; and Odeh, N. *Water Governance*, www.afedonline.org/Report2010/pdf/En/Ch.11 :177.

²¹¹ The World Bank, Op. Cit. (2007). 53.

²¹² UNEP (2011), 125.

²¹³ The World Bank, Op. Cit. 38

needed to mainstream sustainability into core development paradigms and policy, as a key basis for achieving and sustaining development results and freedoms.

- Sustainability entails social empowerment and enhanced freedom of opportunity. Beyond increased personal consumption, this includes increased accountability and freedom from the inequities that often result from systems of resource exploitation and disproportionate impacts of ecological change.
- Higher expectations will emerge in society, particularly within the increasingly vocal and globally connected youth segment, for more effective, accountable and participatory use of natural wealth as a public good.
- The process of governance reforms and accountability emerging in the region stands as an opportunity to expand the benefits of natural wealth for the average citizen, and the poor in particular, broaden access and benefit-sharing, combat corruption, and prevent squandering of natural wealth to preserve its value for future generations.
- A human rights-based approach is needed to address issues of sustainability. Environmental harms and rights abuses often go together and are symptomatic of political and socio-economic contexts through which threats to environment also constitute threats to life, livelihood and health.
- A legal empowerment approach can give poor people and communities the legal tools to proactively protect themselves from the effects of ecological change, and give the poor in particular more equitable access to natural resources. Increasing citizen access to information, participation and justice in decision-making over natural resource and the environment is a priority.
- If not matched by measures to make economic growth more equitable and sustainable, governance reforms may not be able to bring about desired changes in the region. As countries proceed on political and economic transformation, the green economy concept can be of value. Green economic solutions can achieve higher annual growth rates than the business-as-usual scenarios, including opportunities for generating a high-tech knowledge economy and new youth employment.
- As demand for solutions to food, water and energy challenges grow, the market for green solutions has surged globally, with large potential for the Arab region to benefit from these innovations, and to potentially take a lead role in their further development and application. A need exists for public policy, strategies and regulatory frameworks that incentivize and promote green solutions, investment and technology.
- Options including expanding energy efficiency and renewable energy in key sectors like heavy industry, buildings and transport; agro-ecology and ecologically sound farming with drought resistant crop diversification and replenishment of soil nutrients; industrial and irrigation water recovery, reuse, and treatment; and up-scaling the reduction and reuse of waste from industrial, commercial and residential sources.
- With emerging economies leading many sectors of green economy, opportunities exist for south-south cooperation, with the Arab region potentially building on its energy sector capacities and finances to positioning itself in key green economy sectors like food, energy and water. Key issues of common concern for which lessons can be shared include food, water and energy subsidy reform, solar power feed-in-tariffs and CSP/PV technology development, incentives for technology transfer and foreign investment including through venture capital, and end-use efficiency policies for industry, agriculture and water.
- In 2011 the UN Food Price Index hit an all time high, with food prices threatening to reverse critical poverty reduction gains by countries in the region. Growing populations and rising demands will combine with increasing ecological pressures and climate change impacts to bring continued uncertainty to food prices in the future. In the Arab region

agricultural output could decrease 21% in value terms by 2080, with up to 40% decrease in parts of North Africa where climate change is expected to be the harshest.

- Causes of food insecurity have shifted away from cyclical surges driven by weather, now facing structural changes from a convergence of surging demands and bottlenecks to productivity from climate change, rising energy costs, reduced groundwater and soil fertility. These factors are more pronounced in the Arab region with less per capita arable land and renewable water; already the world's largest net importer of cereal.
- 76% of the Arab poor reside in rural areas dependent on agriculture, while it food consumption makes up 35% of household expenses in countries like Tunisia and Egypt. The region could face continued risks of social instability from recurrent food crises, with efforts to green agriculture supporting ecological sustainability, as well as rising incomes for the poor and upholding access to food as a human right. Special attention is needed to engage small and marginal farmers in this process.
- Enhanced social safety nets and increased agricultural productivity is needed to adapt to these challenges, both of which can be key parts of a green economy framework. Such efforts would help prevent reduction of household allocations to health and education for other expenses with risk of disinvestment in youth, while also investing in young rural farmers who will be on the frontline of food security in the future.
- Green economy investments include drought resistant crops and improved water conservation to help farmers adapt to shifting climates, alongside investments in energy efficiency and renewable energy applications, reuse of agricultural waste, methane capture through biogas systems, enhancing soil carbon, expanding agro-forestry, crop diversification, production of high-value organic produce for urban markets, reduction of persistent organic pollutants (POPs), and replenishment of soil nutrients.
- The convergence of declining energy reserves, dramatic rise in emerging economy demand, and a gradual global shift to climate-friendly growth, have created a break from the type of cyclical factors that shaped the past, with oil prices likely to remain in the high range for some time.
- Oil exporting countries in the region are diversifying their economies to create new youth employment, but this is resulting in rapidly rising levels of energy intensity of growth, exacerbating decline of oil reserves and creating risks for future development. This is leading to a push for expanded energy efficiency and renewable energy to reduce the energy intensity and save increasingly scarce oil for the future generation.
- In oil importers, the majority of Arab countries, rising oil prices create a drain on public resources, with energy efficiency and renewable energy initiatives seen as a means of reducing import dependent and allowing reallocation of finances to development initiatives. Approximately 40% of the poor do not have adequate access to energy services in the Arab region. Expanding sustainable energy access for the poor is thus a win-win option from economic, social and environment perspectives.
- Across the Arab region, green economy approach would see a reorientation of the region's energy sector expertise, taking advantage of its world leading solar radiation and wind resources, and setting the foundations for its role as a future leader in the clean energy economy. Clean energy supports the rise of a new high-tech industry, as an element of a future knowledge-based economy and youth employment.
- A green economy approach enhances regulatory frameworks, increasing end-use energy efficiency in industry, transport, appliances and buildings, increasing efficiency of power supply stations and transmission systems, shifting to renewable energy based power generation through feed-in-tariff provisions and market incentives, stimulates business innovation and private sector participation, enhances design and targeting of energy

subsidies to remove barriers to expansion of clean technologies, and phased introduction of low-emission technologies.

- Energy efficiency is a critical opportunity, with 'no regret' policies to reduce energy intensity. A particular focus is needed to integrate energy efficiency into new buildings, the largest, most cost-effective opportunity for energy efficiency in the Arab region. Policies and regulations are needed to mandate new building codes, market incentives for developers and tenants, standards for equipment and insulation, etc.
- Capacity development support is needed to help implement new national clean energy policies, while large opportunity exists from a pan-Arab solar network stretching across the region's deserts to capitalize on the region's world-leading levels of solar, with concentrated solar power (CSP) a cost-effective solution.
- More than 45 million people in the Arab world still lack access to clean water or safe sanitation. Meanwhile, water scarcity is expected to increase owing rising population, climate impacts and declining water reserves. Meanwhile only 43% of water originating within the region itself, making the Arab region the most dependent on external sources. 15 of the 22 countries below the international water poverty line are in the Arab region, which hosts a 37-53% rate of water use efficiency.
- Water availability is expected to fall by one third as the population doubles by 2025, with particular risks for the poor who often pay more for water access in many cities, while facing risks to agriculture which depends critically on irrigation in many countries in the region. Enhanced targeting of water subsidies is needed to ensure that the poor benefit from water subsidy systems in both urban and rural settings.
- Water governance is seen as the most cost effective means of address water security and achieving the goals of a green economy. A key challenge is to find appropriate means of pricing water and putting in place incentives for sustainable use of water resources, as well as confronting challenges in decentralization, integrated water resources management and stakeholder participation. Another key trend in Arab water service provision in the last decade has been the increasing role of market based approaches and the private sector, with opportunities to create markets for tradable water entitlements.