

**Institutional context for sustaining the values of ecosystem services in Lake Victoria Basin:
challenges and opportunities for the adoption of MEA-based bundled markets for ecosystem
services**

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Abstract:

This is a synoptic analysis of the opportunities as well as the disincentives in the Kenya's environmental and poverty reduction policy framework for the adoption of integrated processes and the use of PES mechanisms. Given that national policies and legislation provide frameworks for the mainstreaming provisions of the Multilateral Environmental Assessments (MEA), national action plans were analyzed vis-à-vis ongoing or evolving activities. This was aimed at exploring the possibility of pursuing bundled markets for ecosystem services (MES) for provisioning, regulating, supporting and cultural services. This analysis has shown that: i) different environmental policies and poverty reduction strategies potentially affect integrated processes and adoption of MES, ii) the how of implementing the strategies so as to reduce negative impacts on ecosystem services are not clear and left to the district to decide plans, projects and programmes for their implementation, iii) the translation of the national action plans into projects or programs are consistent with what is provided for in the plans, iv) the activities implemented to achieve the different MEA objectives synergize one another therefore offering potential opportunities for the adoption of bundled MES, and finally v) MES provide opportunities for integrated policy formulation, implementation and monitoring at different scales.

1. Introduction

The failure to adequately understand the synergistic relationships between rapid population growth, rising levels of poverty and inappropriate development approaches have resulted in both short-and long-term impacts on watershed services, carbon sequestration, biodiversity, and scenic beauty (NEPAD, 2003). Government command-and-control approaches have failed to protect these environmental services unlike provisioning services which are quantifiable and ownership can be traced to individual farmers. Continued ignorance of these environmental services as wealth-creating assets¹ for the rural poor and a fall-back for many when formal employment falter (WRI, 2000) reinforces the existing scenario. This therefore requires that users of ecosystem services, with some role for government, must recognize, support and incentivise the rural poor in pursuing land uses that provide the basis for stable productivity. Government, through policy and legislation for example provide for strategies for incentivising land users, but often rarely translated into tangible benefits. This is partly due to lack of a framework and the failure of government to recognize productive ecosystems as income stream for the rural poor. Market-based approaches like payments for environmental services (PES) are increasingly seen as providing a framework for implementing plans and strategies provided for in various policy and legal regimes at the national level. PES also provides opportunities for domesticating, operationalizing and harmonizing MEAs objectives with the Millennium Development Goals (MDGs). Payments and/or rewards for ecosystems services as Anantha (2006) observes are “*expected to take an increasing role in providing incentives for conservation and the sustainable use of ecosystem services*”. Anantha (2006) further argues that “*MEAs as legally-binding instruments, offer an appropriate institutional structure for supporting market-based instruments*”. Financing and partnership opportunities provided for by the Multilateral Environmental Agreements (MEAs) are rarely explored for the adoption of innovative approaches and where they are, capacity and enforcement limitations abound. This is true for Kenya, as it is for most developing countries.

Despite the potential of MEA-based schemes for environmental services (PES) to attract private contributions, introduce sustainable resource management practices, provide alternative economic opportunities for the rural poor and promote cooperative natural resource management among government, business and local communities, they have largely taken place outside the framework of the Rio Conventions² except for the UNFCCC through its Clean Development Mechanisms (CDM)³. Blossoming initiatives in Africa are not taking advantage of opportunities provided for in the existing policy and legal regimes. However Africa’s interest in ecosystem services as an alternative income stream is rising as depicted by the existence of at least 20 voluntary carbon sequestration projects stimulated by interest in the Clean Development Mechanism (CDM) of the Kyoto Protocol⁴, several reward and/or payment schemes for biodiversity conservation and upcoming initiatives on watersheds services.

The purpose of this synthesis is therefore threefold: i) review Kenya’s environmental and poverty reduction policy framework on how it is likely to influence integrated processes and the use of payments and/or rewards for environmental service mechanisms, and ii) mainstreaming of MEAs based on national action plans and strategies and iii) exploring their implications on sustaining ecosystem services in Nyando and Yala River Basins, especially for the design of MEA-based markets for ecosystem services.

¹ http://www.wri.org/biodiv/pubs_description.cfm?pid=4073

² United Nations Framework Convention on Climate Change (UNFCC), Convention on Biological Diversity(CBD) and the United Nations Convention to Combat Desertification (UNCCD)

³ www.unisfera.org

⁴ Jindal, R., Swallow, B. and Kerr, J., 2006. Status of carbon sequestration projects in Africa: potential benefits of challenges to scaling up. World Agroforestry Centre Working Paper.

2. Overview of the state of ecosystem services in Lake Victoria Basin

Over the years, Kenya's population and urbanization growth rates⁵ shifted government's focus from rural areas to urban centres⁶ leading to recognition of the industrial and service sectors as engines of economic growth and innovations (Tropp, 2006). However as the negative impacts of rural-urban influxes became apparent the government responded through the adoption of regional development policies. Post-independence⁷ policies and national development plans advocated for investments in high potential areas with expected trickle down effects to drylands⁸. In critical watersheds (e.g. Mau, Cherangani, Yala etc) the thresholds of different environmental services have been constraint. Population in the Lake Victoria catchment has been doubling every 22 years (Mbaria, 2006), increasing the pressure on local resources: Fish, forests, agricultural land and water. Landscape transformation⁹ threatens the 17 fish *taxa* and 400 cichlid species (GOK, 2003), water quality, wetlands¹⁰ and Victoria's bird life. These have led to loss of land cover, pollution, sedimentation, invasive species, biodiversity loss, flooding, and reduced fisheries. Despite initiatives implemented through the Lake Victoria Environmental Management Project, LBDA, EMCA, EAC, ICRAF, other NGOs and government agencies, ecosystem degradation continue unabated. This is depicted by the resurgence of the water hyacinth (1000 hectares of the Lake is currently infested by water hyacinth).

Oyugi et al., (2003) observes that forests¹¹ make 40 percent of the Lake basin area providing habitat to numerous plant and animal species. The Lake's shallow inlets and bays are home to giant hippopotamuses, thick-skinned crocodiles, birds (e.g. weaver birds) and a host of hundreds of different kinds of fishes, some not found anywhere in the world. The basin's tourism potential including sport fishing, boating, and cruising safaris is yet to be developed.

Today, Lake Victoria is considered a showcase of how profound and unpredictable trade-offs can be when management decisions are made without regard to how the ecosystem can react (World Resource Institute, 2001). Current problems afflicting the Lake Victoria ecosystem are made complex by policy and institutional failures as well as differences in the levels of capacity, implementation, political ideologies and interests of the different countries¹² that make up the basin. The basin's hydrological significance to Uganda, the Sudan and Egypt as the source of Victoria Nile¹³ further complicates the policy context. Lake Victoria's fisheries continue to be important source of food and employment for the region's 30 million people despite the negative impacts¹⁴ of catchment degradation. WRI (2001) observes that before the 1970s Lake Victoria contained more than 350 species of the cichlid family, of which 90 percent were endemic. Cichlids once accounted for 80 percent of the Lake's biomass, but by 1983 Nile perch made up almost 70% of the catch, with Nile tilapia and a native species of sardine making up most of the balance

⁵ 3% and 6% respectively (NEMA. 2003. State of the Environment Report. Government printer, Nairobi).

⁶ Urbanization was advocated through Kenya's Growth Centre Policy

⁷ Kenya's Sessional paper No. 10 of 1965 on "African Socialism and its application to planning in Kenya" and Sessional Paper No. 1 of 1986 on "Renewed Economic Growth" concentrated development projects in high rainfall areas ignoring the economic potentials of arid and semi-arid areas

⁸ Drylands, as defined by the United Nations Convention to Combat Desertification (UNCCD), include the arid, semi-arid, and dry sub-humid zones. 80% of Kenya's surface area is dryland

⁹ Enhanced by high poverty levels, poor governance, inappropriate land use, conversion of forested land for agriculture, unsustainable exploitation and increased demand for resources together with rapid population growth combine together.

¹⁰ Lake Victoria shores, Yala Swamp, Lake Kanyaboli, Lake Simbi, Sondu Miriu and Nyando Rivers

¹¹ Including Kakamega, Mt. Elgon Forest, Lambwe valley Forests, Koder Forests, Gwass Hills Forests, Tinderet, Mau, etc which have been declining because of adoption of Nyayo Tea Zones approach and increasing woodfuel demand

¹² Kenya, Uganda, Tanzania, Burundi, and Rwanda

¹³ Is also drained by a network of rivers (Kagera, Nzoia, Gucha-Migori, Sondu Miriu, Mara, Yala, Issanga, Biharamulo and Nyando) { Twong'o T. K. and George M. Sikoyo...}; Shepherd et al., 2000).

¹⁴ Land-use changes causes sedimentation and nutrient loading leading to algal blooms and low oxygen levels in deeper waters.

(Ibid). Uncontrolled fishing of endemic species and over fishing was an impetus for the introduction of the Nile Perch and the Nile Tilapia. Despite the resultant reorganization of the Lake's biodiversity, WRI (ibid) argues that the commercial fishery¹⁵ was not destroyed as depicted in the trading biodiversity for export earnings between 1968 and 1988. The introduction of the Nile perch and Nile tilapia however affected the nutritional status of the local communities as most of the catch was shifted out of the region (Oyugi et al., 2003).

The *"Improved Land Management in the Lake Victoria Basin Project"*¹⁶ indicated that Nyando basin is: the main source of sediment and phosphorus into Lake Victoria. Shepherd *et al.*, 2000 further notes that:

"the principal causes of soil erosion include deforestation of headwaters and overuse of extensive areas of fragile lands on both hill slopes and plains, coupled with the loss watershed filtering functions through encroachment on wetlands and loss of riverine vegetation. Depletion of vegetation is likely to have also considerably reduced the biodiversity of the area".

In 2003, thirty three percent of wetlands in the Lake Victoria Basin were threatened by deforestation and land-use change (NEMA, 2003) leading to loss of land cover, invasive species, loss of water quantity and quality, loss of biodiversity, flooding, and reduced fisheries. Given the location, spatial extent, significance and the magnitude of the problems confronting the Lake Victoria ecosystem, there have been several policy initiatives both at the national, regional and international levels that have implications for the basin's ecosystem services.

Lake Victoria Basin has been classified by the government as a 'poverty belt'¹⁷ with between 50 to 70 percent of its population living in absolute poverty (Mbaria, 2006). This is paradoxical because the Lake Victoria Basin richly endowed with abundant resources¹⁸. High poverty levels and unemployment have been attributed to the collapse of the Rice scheme in Kano, the cotton industry, the molasses plant, limping sugar factories, empty cotton mill, disused fishponds and abandoned irrigation scheme at Yala (Oyugi et al., 2003). Land use change and catchment degradation have affected water quality and condition of the catchments affecting the fishing industry. In both Nyando and Yala sub-basins poverty levels can be linked to the state of natural resources in different agro-ecological zones. Maize, milk, and vegetables produced in high potential areas are sold to communities living downstream in relatively drier zones of the basin. The lowlands are highly degraded and less productive (Wangila and Swallow, 2001; Swallow et al., 2001 and Mungai et al., 2004). Environmental degradation, resource depletion, poverty and policy are closely interlinked. As Oyugi et al., puts it, the scenario in Lake Victoria Basin requires a shift in emphasis, priorities, and policies in:

- *Economic development*-adopting policies that support the larger informal sector that is a source of jobs, income, and affordable goods and services for the poor majority;
- *Agriculture*-pursuing policies that improve on food security of rural/urban poor and fair returns for small-scale farmers rather than policies that promote production for the export market;
- *Land tenure*-pursuing inclusive policies that promote the rights of women to inherit and own land;
- *Health-policies* that focus on affordable and accessible primary health care for the poor;
- *Human settlements*-policies that give priority to lethal shelter, water and sanitation problems of the poor majority in urban and rural settlements;
- *Biodiversity*-promoting non-consumptive wildlife utilization approaches; and
- *Environmental conservation*-promoting integrative approaches that promote good conservation of natural resources through the adoption of soil and water conservation measures and promoting upstream-downstream links.

¹⁵ In 2001, the Nile perch fishery produced 300,000 metric tons of fish translating into US\$ 280-400 million (WRI, 2001)

¹⁶ Shepherd et al., 2000. Linking Land and Lake, Research and extension, catchment and Lake Basin. ICRAF

¹⁷ Republic of Kenya. 1999. National Poverty Eradication Plan 1999-2015. In Oyugi, et al., 2003. Lake Victoria (Kenya) and its environs: Resources, Opportunities and Challenges. Kendu Bay: Africa Herald Publishing House.

¹⁸ GDP of the Lake catchment is UD\$3-4 billion annually, a multi-million fishing industry, unexploited ecotourism potential, repository of biodiversity, water itself etc (Oyugi et al., 2003)

Mechanisms for restoring and sustaining ecosystems and associated services within the different agro-ecological zones for purposes of achieving the Millennium Development Goals (MDGs) are urgent. However questions on whether Kenya's macro-economic policy is supportive or inhibitive persist: How does the ERS address these issues? What are their likely implications on the existing resource base? Under what scenarios can the potential impacts of macro-economic policy be minimized?

3. Policy, legislative and organizational milieu and implications for ecosystem services

3.1 Ecosystem services

The Millennium Ecosystem Assessment (MA) defines ecosystems as “a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit” and ecosystem services as benefits people obtain from such ecosystems. Ecosystem services that this review is focusing on include *provisioning services* (e.g. food, water, timber, and fiber), *regulating services* affecting climate, floods, disease, wastes, and water quality, *cultural services* that provide recreational, aesthetic, and spiritual benefits and finally *supporting services* such as soil formation, photosynthesis, and nutrient cycling (MA, 2005). The state of ecosystems as discussed earlier influences the ability of people to meet different constituents of human well-being¹⁹. The ability of ecosystems to provide for ecosystem services in the required quantities and state is often supported or inhibited by the existing policy and legislative milieu. Regime structures function at different levels to enhance achievement of different constituents of human well-being.

Kenya's policies and legislation address more than two ecosystem services and rarely specific to one sector. Strategies aimed at improving food security through agricultural land expansion for example have implications for regulating; supporting and cultural services (see the different scenarios in section...on predicted impacts of the different policy strategies). Legislation focusing on sugar-cane, coffee, pyrethrum, tea, and dairy can be said to be specific to provisioning services. This may not hold because improved marketing leads to increased income which could be used to expand the area under a specific crop, therefore reducing land available for producing food related provisioning services like maize and beans. Increased demand for fish exports from Lake Victoria for example, has affected the nutritional status of the fish-dependent communities.

3.2 Policies and Legislations affecting ecosystem services in retrospect

3.2.1 Regional Policy and development context

According to Twong'o T. K. and George M. Sikoyo (2004) regional efforts to manage the fisheries of Lake Victoria started in 1920s when a lake-wide collaborative initiative to regulate and maintain catch statistics was started. In 1947 the East African Fisheries Organization (EAFRO) was instituted and was responsible for research on fisheries and on hydrology of the Lake Victoria (ibid). Twong'o and Sikoyo further observe that in 1960 EAFRO was transformed into East African Freshwater Fisheries Research Organization (EAFPRO). However with the collapse of the East African Community in 1977, collaborative activities

¹⁹ See MA, 2005 and Anantha 2005 for a list of 10 constituents of human well-being

became dormant until the formation of the Committee for Inland Fisheries of Africa (CIFA) that provided a forum for regional collaboration in the management and development of the Fisheries of the lake.

Nyando and Yala River Basins are part of the Nile Basin and therefore receive substantial support through the Nile Basin Initiative. Through the Lake Victoria Environment Management programme (LVEMP) regional governments collaborate together to address the factors affecting the lakes' ecosystem. The East African Community provides a framework for extensive political cooperation and integration, among Tanzania, Uganda and Kenya as well as Burundi and Rwanda which have since applied to join the EAC. East Africa Community is currently establishing the Lake Victoria Basin Commission (LVBC) to manage the entire Lake Victoria Basin area, including Nyando and Yala River Basins. Other regional initiatives which have implications for the management of the Lake Victoria ecosystem include NEPAD's Action Plan of the Environment Initiative, the operationalization of the Rio Conventions and initiatives aimed at achieving the millennium development goals. In the Action Plan of the Environment Initiative of the New Partnership for African Development (NEPAD), land degradation is a major area of attention, alongside biodiversity conservation, drought and climate change mitigation, protection of fragile ecosystems and ozone layer protection. NEPAD's Comprehensive Africa Agriculture Development Programme (CAADP) provides an entry point for integrating sustainable land management (SLM) in agriculture and natural resources management with mainstream national priorities of poverty eradication, improved food security, accelerated economic growth and development, promotion of women in development and international Millennium Development Goals (MDGs). Ratification of the Convention to Combat Desertification (UNCCD) in the late 1990s and subsequent development of National Action Programme (NAPs) for its implementation has led to raised awareness from national to local levels, including of the close links between degradation and poverty. Loss of biodiversity has been widely recognized in the environmental sector, especially for the protection of large fauna, birdlife and indigenous forest species through national parks and forest reserves. During the decade since ratification of the Convention on Biological Diversity (CBD), there has been raised awareness of the importance of biodiversity and the ecosystem approach. National Biodiversity Strategies and Action Plans (NBSAPs) have been prepared but, there are limited resources for their implementation. Relevant actions have also been developed under the Framework Convention for Combating Climate Change (UNFCCC) and the Ramsar Convention respectively.

3.1 *Institutional context in retrospect*

The current state of ecosystems, associated services and variations in poverty incidences can be said to be a function of the policies and legislation adopted during the three epochs²⁰ of Kenya's natural resource utilization. The pre-colonial modes of resource management were organized around communal resource ownership and governed by cultural and religious norms with binding regulations and sanctions. Low human population densities, use of simple tools, limited trade and the perceived 'bountifulness' of resources ensured that communities met their subsistence livelihood requirements without undesirable impacts on the natural resource base. The dawn of colonialism adversely transformed the relationship between local communities and "their resources". Such transformation was driven by changes in resource ownership, access and user rights and the concentration of Africans in Native Reserves. Through gazettment, the colonial government appropriated forest resources, declared forests off limits for local communities through ordinances, pushed natives into crowded colonial reserves, appropriated huge chunks of arable land for agricultural intensification to meet markets demands and promoted adoption of soil conservation measures. This subsequently led to the formulation and adoption of Swynerton Plan of 1954 that provided for issuance of titles and later growing of coffee and tea by African farmers. Kenya's post-independent government treated local communities as grateful recipients and not partners in natural resource management. This has been attributed to government's failure to recognize the potential of

²⁰ Pre-colonial, colonial and post-colonial. Elsewhere these epochs are classified as pre-industrial, industrial and post-industrial

community participation in the management of natural resources. The government however, through the extension system, emphasized on provisioning services and neglected 'intangible' services.

The formulation and adoption of the Sessional paper No. 10 of 1965 on African Socialism and its Application in Kenya laid the foundation for socio-economic development through eradication of hunger, disease and poverty providing conditions for rapid population growth, increased woodfuel consumption, declining forest cover, encroachment of agriculture into marginal areas, decline in access to portable water and sewerage systems especially in urban environments, water quality decline in urban areas, proliferation of slum settlements and high poverty²¹ levels. Policy responses aimed at reducing population growth rate and therefore the impacts on supporting and regulating ecosystem services, albeit implicit, included Family Planning Programme of 1967, Sessional Paper No.4 on Population Guidelines, Reproductive Health Strategy, Sessional Paper No.4 of 1994 on HIV/AIDS in Kenya and Sessional paper No. 1 of 2000 on population Policy for Sustainable Development. Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth focused on high potential areas with expected trickle down effects. This instead encouraged encroachment and excision of forested areas and agricultural intensification leading to water pollution, soil erosion and decline in production because of decline in soil fertility. Despite multiple policy responses, ecosystem services decline continue unabated. Land/land use change and the agriculture sectors are illustrative of the diversity of policy responses within or across different sectors both at the macro- and micro-economic levels. Table 1 summarizes these as drivers, pressures, status, impacts and responses (DPSIR) as a way of illustrating long-term policy responses with minimal long-term positive impacts on ecosystem services.

²¹ 48% of the population lived below absolute poverty in 1992 and increased to 56% in 1997

Table 1: Retrospective overview of the Drivers, Pressures, Status, Impacts and Responses (DPSIR) in Land use and Agricultural Sectors

Theme	State	Pressures	Impacts	Responses
Land and Land use	<ul style="list-style-type: none"> -17% is high to medium potential land; -Different tenure systems with different implications for ecosystem services; -Changes in land use occur over time and sometimes policy enhanced; and -Over 80% of Kenya's surface area is ASAL-a policy for their development is still being formulated 	<ul style="list-style-type: none"> -3% population growth rate not linked GDP; -Agricultural expansion into ASALs affecting ecosystem resilience; -ASALs support 25% of human, livestock, 50% of wildlife populations; -Are conflict prone; -Government advocating of land tenure change from communal land to freehold; -Impacts of climate variability distort people's livelihoods; -Overexploitation of natural resources to meet economic demands 	<ul style="list-style-type: none"> -sub-division of high potential land into uneconomic units; -Land degradation; -Loss of forest biodiversity; -Food insecurity both in high potential and dryland areas; -Poverty and land use conflicts; -Shortage of water resources in ASALs -Cultural erosion by immigrants; -Social instability 	<ul style="list-style-type: none"> -Land use planning-Land Planning Act, Physical Planning Act Cap. 286, Local Government Act Cap. 265 -National Land Policy -National Environment Action Plan -Regional Physical Development Plans; -Local Physical Development Plans; -Provincial and District Action Plans; -Urban Environmental Plans -Sessional Paper No. 10 on Environment and Development; -PRSP formulation -Land tenure arrangements for access to land, conservation of biodiversity -EMCA EIA provisions; -National Action Plan to Combat Desertification -ASAL Development Policy (1992)
Agriculture and Livestock	<ul style="list-style-type: none"> -Only 17% of total land is high to medium potential -Crop and livestock diseases increases during the dry season, but not true for all disease; -1% of funds is allocated to agriculture; -Poor quality inputs are 	<ul style="list-style-type: none"> -Increasing food demand due to population growth; -Loss of soil fertility; -Variable weather conditions; -Competing budgetary requirements; -Poverty influencing affordability of quality seeds; 	<ul style="list-style-type: none"> -Sub-division of land into uneconomic land units; -Food insecurity policy shifting agriculture to ASAL areas; -Loss of forest biodiversity; -Loss of yields and productivity; -Limited Research and use 	<ul style="list-style-type: none"> -Kenya Rural Development Strategy (1999); -National Agricultural Research Program implemented by KARI; -EMCA; 1999 -Special Food Security Programme; -NAEP and NALEP; -Crop protection policy, pest and

	<p>used and most farmers cannot afford them;</p> <p>-Limited no. of farmers adopt new technologies;</p> <p>-Poor infrastructure (markets, roads, electricity) in rural areas;</p> <p>-Investment in sustainable land management is minimal;</p> <p>-Policy regulation in the sector is inadequate;</p> <p>-Eco-system pollution and impacts on human health are long-term</p>	<p>-Poor research-extension-farmer linkage;</p> <p>-Limited budgetary allocation for rural infrastructure development;</p> <p>-Participation of middlemen in Marketing and globalization;</p> <p>-Demand for safe food;</p>	<p>of low quality inputs;</p> <p>-Declining productivity in the agricultural sector;</p> <p>-Culture and traditions;</p> <p>-Poor access to markets and inefficiency in commodity marketing;</p> <p>-Low prices leading to increase in the levels of poverty;</p> <p>-Environmental pollution;</p> <p>-Unsustainable agricultural practices in ASALs affecting ecosystem resilience;</p> <p>-Uncoordinated policy implementation;</p> <p>-8-10 million people are affected by desertification;</p> <p>-Loss of land by alienation process, insecurity, cattle rustling and overgrazing</p>	<p>disease control programmes;</p> <p>-National Agricultural Extension Policy;</p> <p>-National Agricultural and Livestock Extension Programme;</p> <p>-Inputs Monitoring;</p> <p>-Agricultural Technology and Information Response Initiative (ATIRI);</p> <p>-Commodity specific policies;</p> <p>-Crop specific policies</p> <p>-Cooperative societies and marketing boards;</p> <p>-Consumer education and Agrochemical control Acts</p>
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Source: Modified from GOK, 2003

As government financial resources dwindled and donors imposed stricter aid conditions, the government started tapping into community resources promoting partnerships in service provision. Policy and legislative reforms albeit minimal started in 1980s and gained momentum in late 1990s leading to new generational policies and laws. These generally provide opportunities for partnerships among different stakeholders for sustainable natural resource management, but are not synergized across the different sectors. In order to avoid negative impacts of ecosystems there is need for newer and forward looking frameworks embedding principles for ensuring realization of social and ecological objectives in the policies, plans, projects and programmes set forth in policy responses.

3.3.1 Macro-economic policy and potential impacts on ecosystem services

Participatory poverty assessment (PPA) of 2001 recorded the highest prevalence of absolute poverty of 63 percent in Kisumu followed by Nairobi with 50 percent. North Eastern province exhibited the highest prevalence of absolute poverty of 69 percent followed by Nyanza (65%) and Coast with 62 percent. The UNDP human development report for 2006 for Kenya provided the same trend. This has to do with the state of the four ecosystem services. In 2001 through the PPA, communities identified low agricultural productivity and poor marketing, unemployment and low wages, insecurity, poor infrastructure, land related issues, cost of education, bad governance, HIV/AIDS and gender imbalance as the main causes of poverty. At that the government proposed pro-poor and pro-growth strategies through linking policy, planning and budgeting and participatory identification of national development objectives and priorities. Macro-economic policies that were proposed through the PRSP included realigning the composition of the GDP towards investment, improving the quality of expenditure in line with poverty reduction goals, institutionalization of appropriate taxation policies, institutional reforms for monetary policy and tariff harmonization within EAC and COMESA regions. These were aimed at maintaining a stable and low inflation regime so as to enhance farmers' accessibility to credit. A key component of the short-run measures was an enabling environment for investment purposes. Medium-term solutions included reforming the incentive structure to remove distortions in basic prices, ensure clear signals for domestic and private investments and reducing domestic debt to sustainable levels.

In the agriculture and Rural development Sector, which was seen as a priority sector, PRSP interventions included strengthening extension delivery, promoting private sector participation, promotion of the National Agriculture and Livestock Extension Programme, incorporation of HIV/AIDS education in extension and strengthening drought management and mitigation system among others. Advancement of new pro-poor technologies and promotion of linkages between research and extension were also attempted. In the fisheries sub-sector, the government planned to improve landing sites, improve sanitary facilities, provide portable treated water, enforce fishing regulations, promote fish exports and fish farming. Some of the strategies proposed under forestry for promoting sustainable environmental management included streamlining policy, legal and regulatory framework, mitigating uncontrolled deforestation and excision of forests, improving natural forest conservation for water and biodiversity value, strengthening community-based forest management, promoting agroforestry, undertaking comprehensive forestry inventory and developing farm forestry products. In an effort to promote a clean environment for beneficial use, the government through the PRSP proposed to pursue strategies that integrate biodiversity management principles into national development planning, implement provisions of the Environmental Management and Co-ordination Act, develop natural resource inventory and research, control water hyacinth in Kenyan lakes and implement the National Environmental Action Plan of 1994. Cross-border initiatives included harmonization of cross border biodiversity assessment and management. Most of the PRSP-related strategies were not implemented because of regime change in 2002 and subsequent re-orientation of both macro-and micro-economic policy as per the Manifesto of the National Rainbow Coalition (NARC).

The PRSP process and results informed the formulation and adoption of the Economic Recovery Strategy (ERS) for Wealth and Employment creation which was necessitated by declining per capita income (US\$ 271 in 1990 to US\$ 239 in 2002), high levels of unemployment (2million or 14.6 percent of the labour force), burgeoning levels of poverty and declining agricultural productivity (declined from 4.4 percent in 1996 to 1.5 percent and negative 2.4 in 2000). Priorities were however reoriented so as to realize quick wins. In order to stabilize both economic and social growth, the Government through the ERS proposed to create 500,000 jobs annually, achieve a high real GDP growth rate of 7 percent in 2007, reducing poverty levels by at least 5 percentage points from the current 56.8 percent level, containing annual inflation rate to below 5 percent, and increasing domestic savings so as to enable higher levels of investment for sustainable development among others. The achievement of these strategies at different levels has aroused mixed reactions. Many analyses have concluded that the high GDP growth has not translated into increased income for the rural poor. However their achievement is not without implications for ecosystem services. Projected 16.7 and 3.1 percent growth rates in the construction and agriculture sectors respectively has seen increased income to farmers through sales of on-farm eucalyptus (perceived as likely to increase soil erosion, but at the same time an impetus for planting more trees), extraction of natural stone and expansion of quarries, revitalization of Kenya Creameries Corporation (KCC), Kenya Meat Commission, agricultural extensification and intensive use of fertilizers and herbicides and timely payment of tea, coffee and sugarcane farmers. The challenge however is in answering the how these trends can be sustained without affecting water quality, soil fertility, balancing trade-offs between food security and production for the export market. Interventions aimed at revitalizing the productive sectors of the economy²² as per the Kenya Rural Development Strategy through consolidation of over 60 statutes governing the agricultural sector into a single legislation, promoting and linking with other extension service providers, improving credit accessibility, rehabilitation of irrigation schemes, diversification of enterprises and/or crop uses and value addition have also had varied impacts on different sectors of the economy. The revitalization of the Kenya Agricultural Finance (AFC) has seen more farmers accessing credit. Constituency Development funds have also enabled the development of the necessary facilitative infrastructure for marketing, transport and availability of inputs. These have had negative impacts that have not been assessed. Given reforms in governance and promotion of stable macro-economic conditions, private sector investments have generally increased within the last four years. Reforms in governance including the enactment of the Anti-Corruption and Economic Crimes Act and Public Officers Ethics Act have ensured that public funds are used for the intended purposes. Overall tremendous efforts have been made to get the economy back on track through the ERS with the GDP growth rate shooting to 5.8 percent in 2005 (GOK, 2005 and 2006).

In Lake Victoria Basin, the fishing industry is constraint by upstream degradation and an export-oriented government policy. The government through the ERS has developed facilitative infrastructure and pursued cross-regional cooperation in the management of the Lake Victoria fishery resources as well as the impacts of catchment degradation. The private sector is also been incentivised to enhance investments and growth in the sector. In Trade and Industry sector, strategies for enhancing micro and small-scale enterprises are expected to result in spin-offs like reduced rural-urban influxes, stress on urban environment and infrastructure and poverty reduction. The government has undertaken a review of policies and legislations which govern small-scale enterprises and the informal sector. In the ongoing review of Sessional Paper No. 2 of 1997 on Industrial Transformation to the Year 2020 environment has been mainstreamed as a critical source of materials for industrialization. It incentivises micro and small-scale enterprises for poverty reduction and jobs creation. Strategies that are aimed at exploiting marketing opportunities (e.g. the garments or clothing manufacturing under AGOA) are likely to have long-term impacts on poverty and the environment (e.g. the revival of the cotton industry in Western Kenya could shift the balances and trade-offs for ecosystem services).

²² Agriculture, tourism, trade and industry

Growth in the Agriculture, tourism and trade and industry are dependent on the state of forests, water and other natural resources. Currently communities adjacent to critical watersheds either graze their animals in public protected forests or cut thatching and animal fodder grass and materials from the forests. These have had negative impacts for water quality. Lack of policy on alternative fuels however exacerbates deforestation with serious consequences for biodiversity, water supply, hydropower productions, food security and cultural services. Forestry sector policy reform and adoption of agroforestry as a means for realizing the sector's potential are being proposed through the ERS. These are also aimed at achieving both ecological and social goals.

The ERS proposes to integrate the arid and semi-arid areas into the country's development strategy. This is through provision of adequate water, developing support infrastructure, promoting research and disease surveillance, partnering with the private sector, promoting non-consumptive wildlife utilization approaches and land tenure reforms. It is hoped that this is linked to the provisions of the Environmental Management and Coordination Act, 1999 so as to reduce the likely negative impacts of these initiatives on dryland ecosystem services like water, food, climate, and fodder among others. Overall the government proposes an effective structure through which the natural resource base can be improved and managed on sustainable basis by the communities themselves through addressing the land question.

With the implementation of ERS strategies coming to an end this year, the government is currently formulating a macro-economic policy that is intended to guide the country's development in the next quarter of a century amid rapid population growth, globalization and climate change. Through Vision 2030 the government visualizes an overarching vision of a globally competitive, prosperous nation and a high quality of life for its citizens. In order to achieve the objectives of Vision 2030 interventions proposed are aimed at *maintaining a sustained economic growth of 10% p.a over the next 25 years; A just and cohesive society enjoying equitable social development in a clean and secure environment; An issue-based, people-centered, result-oriented, and accountable democratic political system.* Vision 2030 recognises environment as the main thrust for economic development reinforcing the provisions of the Environmental Management and Coordination Act, 1999 and section 71²³ of the constitution of Kenya. It recognises the negative impacts of previous development approaches on the different elements of the environment: water hyacinth reducing the fish catch, landscape transformation in Land Victoria catchment affecting water quality flowing into Lake Victoria, dying of flamingoes in Lake Nakuru affecting the tourism sector, likely decline in export volumes in the horticultural sector due to failure to adopt biosafety regulations and environmental considerations, links between land use change and Mara Ecosystem and potential impacts of climate change and/or climate variability on different ecosystems. The vision's approach is phased into high level diagnostic and benchmarking, high level strategies formulation and master planning and communication strategy involving different activities as summarized in table 2.

Table 2: Proposed approach of Vision 2030 policy framework

Phase I: High level diagnostic & benchmarking	Phase II: High level strategies	Phase III: Master plan & Communication	Comments (based on the Author's experiences)
- <i>understanding the implication of the vision and the key success factors to realise it;</i> - <i>national & sector diagnostics to isolate key</i>	- <i>Development of major objectives and priorities by key sectors based on their competitive advantage, unique competencies & possible inter-sectoral</i>	- <i>Development of implementation plans including activities, roles & responsibilities;</i> - <i>Critical to detail resources needed to realize vision 2030</i>	- <i>The state of ecosystems and their ability to produce ecosystem services in a sustained manner with less inputs will be critical to the realization of the targets set</i>

²³ Kenya's constitution do not have explicit provisions for environmental protection and this section dealing with the right to life is seen as encompassing the right to a clean and healthy environment as the right to life can only be meaningfully enjoyed within a healthy and conducive environment. In the ongoing constitutional review process the right of individuals to enjoy a clean and healthy environment is explicitly integrated into the constitution.

<i>indicators for comparison with Kenya's peers & aspirational Countries</i> - identifying major barriers to national & sectoral development and how to overcome them - identifying key sectors with possibilities of quick wins	<i>linkages for vision 2030;</i> -Development of strategies for each key sector based on a thorough analysis of the external environment as well as the internal capabilities of each; -Strategies able to move the country to the targets envisaged by Vision 2030.	<i>targets, a communication strategy for buy in & an M&E system with clear milestones for effective control of project; and</i> - <i>Piloting of the Vision's strategies/ recommendations in a few sectors before it is fully rolled out.</i>	<i>by Vision 2030</i> -Adoption of tools and instruments including ELA and water quality standards and tools/ modifications for promoting eco-efficiency will integrate environmental considerations; -The pragmatic approach that is result-based will sustain interest in the Vision; -It is the first approach that is based on milestones
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Source: Adapted from a presentation by the Director, Vision 2030 to participants of a dialogue on business and ecosystem management hosted by the World Agroforestry Centre (ICRAF)

The Vision's approach is to ensure that there are quick wins through sector-based priorities setting, understanding the context and instituting an M&E system with clear milestones set upfront. Lessons from the implementation of the ERS and the ongoing discussions on Vision 2030 provide opportunities for pursuing forward looking approaches that are aimed at sustaining the values of ecosystems services. However, some sector-based policies and legal regimes are often inconsistent with macro-economic policies, sources of perverse incentives and fail to promote multi-sectoral collaboration. Given the opportunities provided by the ongoing policy debates, it's possible to implement ecosystem-friendly sectoral plans and strategies through the adoption of market-based approaches.

3.4 Sector-based policies, Legislation and sustenance of ecosystem services

3.4.1 New Generational Policies

The state of ecosystems, trends in ecosystem services and natural resource management approaches have strongly been influenced through policy machinations and manipulations. Resource allocation is tilted by political interests. These affect the use of ecosystem services in the long-term. Sessional paper No. 10 of 1965 on African Socialism and its Application to Planning in Kenya and Sessional paper No. 1 of 1986 on Economic Management for Renewed Growth are often cited as the most likely sources of problems. The continued debate on the need for a 'Marshall Plan' for ASALs as advocated for through the ERS formulation is evidence that development for the last 40 years has been skewed in favour of high potential areas. Impacts of policy fragmentation on natural resources have been adverse translating into potential decline in economic productivity and increases in incidences of poverty. This often threatens social cohesion.

3.4.2 Sessional Paper No. 1 of 1999 on Water Resource Management and Development

Sessional Paper No. 1 of 1999 on National Policy on Water Resources Management and Development recognizes the need for alternative management options and technologies that are not only participatory, but that offer opportunities for new financing for the water sector. It recognizes rural communities living adjacent to critical catchments as important resource stewards and participants in decision-making processes at the catchment level. The Government recognises that increased human activity in Kenyan water catchment areas has contributed to siltation of water courses and a diminished availability of good quality water for domestic, commercial, industrial and agricultural uses in downstream areas. Many policy directions have been taken in the process of addressing the linkages between land use change and off-farm impacts. In section 2.1.2, the government proposes “the preservation, conservation and development of national water resources in the most feasible manner” through “effective river basin-management and practices, which takes full recognition of the role which forests and soil conservation measures play” in enhancing provisioning, regulating and supporting ecosystem services. It further indicates that, “water sources have been neglected with catchment areas...left unattended resulting in depletion of water resources”. It recommends the adoption of an integrated water resources management approach. In section 2.5.2 a multi-objective approach and application of EIA procedures are recommended as tools for reducing potential impacts of the construction of major water projects synergizing the Environmental Management and Coordination Act, 1999. Effluent discharge standards (section 2.6.2) for controlling discharge of waste into water bodies have been developed and recently launched by the National Environment Management Authority. The monitoring protocol for this requires a solid strong evidence base for decision making. It necessitates continued water assessments, monitoring and maintaining an adequate water information system. The Sessional paper links water availability to domestic, industrial, ecological sustenance, the Food Self Sufficiency Policy, enhancement of livestock and hydropower production. Water availability is closely linked with incidences of poverty (section 3.2) and hence government’s plan to emphasize on programmes that have direct impact on the vulnerable sections of the society through: rehabilitating water supply schemes, ‘strategic’ rainwater harvesting, exploring alternative water sources to surface water and constructing reservoirs. Pro-poor water provision as articulated in this policy may not transform into real benefits for the poor because of lack of resources, potential implications of the proposed organizational structure in the water sector, implications of private sector participation and differences in the interests of the different stakeholders, especially on enterprise subsidizing government revenues through taxes (e.g. commercial timber dealers). If the provisions diligently implemented, they potentially facilitate the adoption of market-based instruments, especially for addressing water scarcity, quality and allocation, regulation and conservation among different users and uses.

3.4.3 Strategy for Revitalizing of Agriculture (2004-20014)

The Strategy for Revitalizing of Agriculture (SRA) (2004-2014), the National Food Policy, and the National Agricultural extension Programme are aimed at transforming subsistence agriculture into commercial and profitable business enterprises. It is also aimed at achieving the sector’s growth targets as set in the ERS as well as the poverty targets (see discussion on the PRSP). The Strategy for Revitalizing Agriculture is aimed at “*progressive reduction of unemployment and poverty*” through creation of an enabling environment for agricultural productivity, investment and private sector involvement. Through the strategy the government visualizes legal and regulatory frameworks that “*are fair and just to all farmers, producers, processors and marketers; enhance efficient agricultural advisory and extension services; promote efficient agricultural research system and a working, pluralistic agricultural inputs system* (SRA, 2004 P. 22). These are likely to favour large-scale farmers, but translate into long-term social impacts for a few farmers with knowledge and information to make the right investments decisions and implications on soil fertility. The situation of the small-scale holders is likely to be worsened by the proposed pluralistic agricultural inputs system, given the government’s weak enforcement record. Revival of the coffee, tea, cotton, cashew nuts, bixa and sugar-cane sub-sectors are seen as important in achieving the agricultural growth and poverty reduction targets. The achievement of the SRA goal is seen as through policy and institutional reforms. Policies bearing on agricultural

productivity, profitability and terms of trade are proposed for review. Policy reforms are aimed at value addition, re-orienting the liberalization policies of 1990s and enhancing the links between agriculture and other sectors. Institutional reforms that are proposed by the SRA include: i) increasing productivity to lower per unit costs of production, ii) improving the extension system-more from top-down approach in extension to demand driven and reform the agricultural extension system, iii) improving the link between research, extension and the farmer through creation of a multi-stakeholders agricultural innovation system that will consist of a feedback mechanism from beneficiaries, iv) improving access to financial services and credit-promoting factors that will synergize the achievement of both improved services and increasing productivity, v) reducing taxation in the agricultural sector-non-distorting agricultural support programmes (e.g. market development and export promotion), vi) increasing competition in the supply of agricultural inputs, vii) market orientation, viii) encouraging the growth of agribusiness and ix) improving existing regulatory framework. The SRA is being implemented within the context of several other government reform initiatives-the Kenya Rural Development Strategy (KRDS) has set growth targets for each economic sector, which have been reflected in the strategy for revitalizing agriculture.

3.4.4 Sessional Paper No. 9 of 2005 on Forest Policy

Sessional Paper No. 9 of 2005 on Forest policy recognizes forests as providing “invaluable forest related goods and services: energy supply for domestic and industrial processes, provision of timber for construction and trees for regulation of water flow”. It recognizes significant threats to the sustainable management of Kenyan forests. Among them are “inadequate financial resources, illegal logging and charcoal burning and encroachment for agriculture and settlement”. This policy seeks to address the threats by increasing the area under forest cover from the current 1.7 percent to the internationally accepted standard of 10 per cent. The long-term hydrological impacts of afforestation programs are not yet clear, but the Sessional paper is aimed at fostering a participatory approach to forest management. The government through this Sessional paper plans to facilitate the formation of “community forest associations” charged with the management of community forests (PS 1.6.3) through the creation of use/property rights over land and mainstream the forestry sector into economic recovery so as to enabling it to contribute significantly to poverty alleviation strategies. Security of tenure is expected to enhance investment in better-farming practices and joint forest management groups are expected to be the entry point for other initiatives. The Sessional paper is aimed at managing forests as well as promoting sustainable management of natural and riverine forests in the farmlands, particularly for water and soil conservation purposes.

3.5 Sectoral Legislation

3.5.1 Environmental Management and Coordination Act

Kenya’s framework law, the Environmental Management and Coordination Act, 1999 provides the framework for ensuring a clean and healthy environment for all requiring each citizen to safeguard and enhance environmental quality. It also provides a framework for cross-sectoral planning and coordination and sectoral policy formulation. Its decentralized organizational structure for environmental management in Kenya is seen as a solution to previous uncoordinated environmental management: Provincial and District Environment Officers who implement NEMA’s mandate at provincial and district levels include preparation of Environmental Action Plans for their respective provinces and districts. These are integrated into the five-year National Environmental Action Plan (NEAP) by the National Environment Committee. On adoption, the NEAP is meant to become the framework for environmental programmes, especially for land management. Section 24 sub-section 5 provides for a National Environment Trust Fund that will

“facilitate research to further the requirements of environmental management, capacity building” and National Environment Restoration Fund (section 25) is *“a supplementary insurance for the mitigation of environmental degradation where the perpetrator is not identifiable”*. The Act prohibits certain activities relative to riverine, lake or wetland ecosystems without an Environmental Impact Assessment and approval of NEMA (Section 24). The Act therefore provides for the process and procedures for EIA adoption (section 58). Through the EIA requirements and procedures, the potential impacts of the projects listed under the second (s.58 (1)(4) schedule are identified, quantified, mitigation measures prescribed and implemented by the project proponent. This way, it has been possible to regulate potential pollution impacts on water, emissions, conservation of protected areas and promote behavioral change. Other policy instruments provided for by the Act include audit and monitoring, environmental standards²⁴ (section 70), economic valuation instruments, restoration orders, conservation orders and easements. The Act also advocates for the involvement of the community, especially during formulation of terms of references (TORs) for the EIA/environmental audit study. It is based on EMCA, 1999 that other legislations have emphasized participatory management of environmental resources, fair and equitable sharing of benefits from such resources, enhancement of environmental resource values and emphasis on the environment-human well-being linkages. These however are blossoming and are difficult at this stage to assess their extent and contributions towards the state of ecosystem services. Provisions for the conservation of biological diversity for example have been mainstreamed in section 50 through to 53 of the Environmental Management and Co-ordination Act, 1999. Under section 50, it states that the Authority shall, in consultation with the relevant lead agencies, prescribe measures necessary to ensure the conservation of biological diversity in Kenya and in this respect the Authority shall: i) identify, prepare and maintain an inventory of biological diversity in Kenya; ii) determine which components of biological diversity are endangered, rare or threatened with extinction; iii) identify potential threats to biological diversity and devise measures to remove or arrest their effects; iv) undertake measures intended to integrate the conservation and sustainable utilization ethic in relation to biological diversity in existing government activities and activities by private persons; v) specify national strategies, plans and government programmes for conservation and sustainable use of biological diversity; vi) protect indigenous property rights of local communities in respect of biological diversity; vi) measure the value of unexploited natural resources in terms of watershed protection, influence on climate, cultural and aesthetic value, as well as actual and potential genetic value thereof. Sections 51 and 52 provide for strategies aimed at *in situ* and *ex-situ* conservation of biological resources.

Section 53 is concerned with guidelines for sustainable management and utilization of genetic resources in Kenya. Subsection 1 states that the Authority shall, in consultation with the relevant lead agencies, issue guidelines and prescribe measures for the sustainable management and utilization of genetic resources of Kenya for the benefit of the people of Kenya. It further states that without prejudice to the general effect of subsection (1), the guidelines issued or measures prescribed under that subsection shall specify: i) appropriate arrangements for access to genetic resources of Kenya by non-citizens of Kenya including the issue of licences and fees to be paid for that access, ii) measures for regulating the import or export of germplasm, iii) the sharing of benefits derived from genetic resources of Kenya, iv) biosafety measures necessary to regulate biotechnology, v) measures necessary to regulate the development, access to and transfer of biotechnology; and vi) any other matter that the Authority considers necessary for the better management of the genetic resources of Kenya.

Provisions relating to wise use of as provided for in the 1971 Ramsar Convention on Wetlands have been mainstreamed in the Environmental Management and Co-ordination Act, 1999 under section 42. Subsection 1 state that no person shall, without prior written approval of the Director General given after an environmental impact assessment, in relation to a river, lake or wetland undertake certain development activities considered injurious to the ecosystem and associated services.

²⁴ Standards for water quality, effluents, air quality, waste, pesticides and toxic substances, noise and those for ionizing and radiation

Section 42 sub-section (2) states the powers of the Minister with regard to wetlands. The Minister may, by notice in the Gazette, declare a lake shore, wetland, coastal zone or river bank to be a protected area and impose such restrictions as he considers necessary, to protect the lake shore, wetland, coastal zone and river bank from environmental degradation. In declaring a lake shore, wetland, coastal zone or river bank a protected area, the Minister shall take into the geographical size of the lake shore, wetland, coastal zone or river bank and the interests of the communities resident around the lakeshore, wetland, coastal zone or riverbank concerned.

Section 42 sub-section (3) state that the Minister may, by notice in the Gazette, issue general and specific orders, regulations or standards for the management or river banks, lake shores, wetlands or coastal zones and such orders, regulations or standards may include management, protection, or conservation measures in respect of any area at risk of environmental degradation and shall provide for: i) the development of an overall environmental management plan for a lake, river, wetland or coastal area, taking into account the relevant sectoral interests, ii) measures for the prevention or control of coastal erosion; iii) the conservation of mangrove and coral reef ecosystems', iv) plans for the harvesting of minerals within the coastal zone, including strategies for the restoration of mineral sites, v) contingency plans for the prevention and control of all deliberate and accidental discharge of pollutants into the sea, lakes or rivers, vi) plans for the protection of wetlands, vii) the regulation of harvesting of aquatic living and non-living resources to ensure optimum sustainable yield, viii) special guidelines for access to and exploitation of living and non-living resources in the continental shelf, territorial sea and the Exclusive Economic Zone.

3.5.2 Forest Act, 2005

Participatory approach adopted in the Forest Act, 2005 arises from the recognition that legitimate interest groups must have a voice and role in the use and protection of forests (World Bank, 2002). The Act therefore grants communities and individual developers/users the authority over management and use of forest resources. This is however based on a management plan that is prepared by such communities or individuals. The Forests Act, 2005 provides for public consultation, community participation and establishment of management plans for forests and recognize the potential of forests to reduce poverty, to integrate forests into the overall sustainable development of the country and protect vital local and global environmental services and values from forests. The Act provides for a broad-based public collaboration and recognizes a forest community as a group of persons who have traditional association with a forest for purposes of livelihood, culture or religion. It embraces a comprehensive approach to ecosystem management by making provisions for Environmental Impact Assessment (EIA), and includes multi-year result oriented forest management agreements. Some of the Act's provisions that will potentially affect sustenance of ecosystem services include:

1. Section 13(1) and 13(2) allow for the creation of Forest conservancy areas and Forest conservation committees respectively. Section 3(3) provides that one of the functions of the committee shall be to inform the Forest Board on the ideas, desires and opinions of the people living in the Conservancy area in all matters relating to conservation and utilization within the area. The criteria for establishing such conservancies are not stipulated but could include site's hydrological significance, biodiversity intactness, cultural value etc.
2. Under section 36(1), The Director of Forests may, with the approval of the board enter into an agreement with any person for the joint management of any forest aimed at enhancing use or refraining use for biodiversity conservation;
3. Section 37(5) specifies the elements of the management agreement which shall include among other things (a) duration of agreement; (b) terms and conditions under which the applicant shall manage the forest; (c) a management plan to be followed by the applicant; (d) mechanisms for settlement of disputes arising in respect of the agreement;

4. Section 37(6) provides for an independent inventory of the forest and other relevant data to enable it determine the true value of such forests and related resources;
5. Section 40(1) provides that utilization of a forest through concessions and license subject to an Environmental Impact Assessment License in accordance with the Environmental Management and Co-ordination Act, 1999 section 58;
6. Section 46(1) allows a member of the forest community together with other persons resident in the same area to register a community forest association under the Societies Act. This like for the Water Act, 2002 is seen to impede sections 46(2) and 46(3e) because of legal requirements that do not match with the limited capacities and resources of most of the 'perceived' resource stewards. Section 46(2) provides that an association duly registered under 46(1) may apply for permission to participate in conservation and management of forest under jurisdiction of state or local authority. Section 46(3e) the application shall contain the association's proposal relating to; (i) the use of forest resources; (ii) methods of conservation of biodiversity; (iii) methods of monitoring and protecting wildlife and plant populations;
7. Section 47(2) stipulates that management agreement may confer the association such user rights as: (i) collection of medicinal herbs; (ii) harvesting of timber or fuel wood for domestic use; (iii) harvesting of timber or fuel wood; (d) grass harvesting or grazing; (iv) undertaking of Agroforestry practices; (v) plantation establishment through non-resident cultivation (vi) contracts to assist in carrying out specified silvicultural operations (vii) development of wood and non-wood forest based industries community based industries;
8. Under Section 48(1) an association may with the approval of the Director of Forests, assign all its rights under a management agreement to a suitably qualified agent on mutually agreed terms;
9. Section 13(3d) and 13(3e) make provisions for setting charges and retention of income from forest resources at the local level. Section 18 makes provisions for the establishment of a Forest Management and Conservation Fund. One of the purposes of the Fund is to promote community-based forest projects and
10. Section 49 stipulates the grounds for termination or variation of a management agreement. This section outlines the procedures for initiating termination and provides for an appeal process by the affected association.

Provisions 1-10 are provisions for the institutional and regulatory procedures necessary for reorienting forest management from top-down command-and-control to forest resource stewardship through;

- Identification and adoption of specific mechanisms for implementation of stewardship policy mandates, including community participation through community forest associations, mechanisms for joint management of forests, and concessions over state forests;
- Delegation of direct authority to and imposition of responsibilities on, forest officials and individuals and entities operating within the forest sector;
- Empowering implementation, oversight and enforcement of stewardship contracts;
- Multi-year joint management agreements that allow different combinations of user rights or bundles; and
- Financial incentives through retention of income from forest resources at local level to finance community projects.

The Forest Act, 2005 just like the Water Act, 2002 provides an elaborate organizational and technical framework that can be likened to the components of the PES/RES framework. In the recently concluded institutional strategic environmental assessment (SEA) of the Forest Act, 2005 the establishment of the forest service, community participation and use of market based approaches were identified as requiring more nuanced implementation.

3.5.3 Agriculture Act, Cap 318

Mumma (2003) identifies that the Agriculture Act “has significant provisions on the management of ecosystem services”. Part IV entitled “*The Preservation of the Soil and its Fertility*” vests extensive powers in the Minister responsible for agriculture for the purposes of the conservation of the soil; protection of dams or water catchments, the prevention of soil erosion; of the protection of soil fertility; the Minister may after consultation with the Central Agricultural Board make rules prohibiting, regulation or controlling clearing of land for cultivation, grazing or watering of livestock or cleaning of vegetation. The Minister may also make rules requiring, regulating or controlling the afforestation or re-afforestation of land, protection of slopes and catchment area or the drainage of land including the repair of natural or artificial infrastructure, removal of any vegetation which has been planted in contravention of orders, supervision of unoccupied land and prohibiting agricultural activities including de-pasturing of stocks. This has implications for provisioning, regulating and supporting services.

The Act further provide for Basic Land Usage Rules creating offences for cultivation, livestock keeping or destruction of vegetation on land with slope exceeding 35% (rule 3) and cultivating land with slope greater than 12% but less than 35% when the soil is not protected against erosion (Rule 5). The government’s extension system was aimed at guiding farmers in implementing these usage rules as well as adopting recommended land uses for specific parcels of land. Over time the extension system malfunctioned and the Chief’s Act was seen as more effective in preventing soil erosion and prohibition of cultivation on steep hill slopes. Despite these provisions and their implications, in case of violations, the Act has not been successful in stopping the tide of land degradation, soil loss and nutrient loading. The Agriculture Act however does not make provisions for controlling use of fertilizers so as to limit sediment loading and pollution. It could be implicit that once erosion is controlled, downstream nutrient flow is minimized.

Market-based approaches will therefore provided the much needed impetus in legislation reform (e.g. in order to provide for options) and community involvement. Despite such acknowledged failures and concern for the impacts of environmental degradation on agricultural productivity, the Strategy for Revitalizing Agriculture 2004-2014 does not make policy proposals to mitigate degradation caused by agriculture or make provisions for sustaining agricultural production by focusing on environmental conservation.

3.5.4 Water Act, 2002

Sessional Paper No. 1 of 1999 on National Policy on Water Resource Management and Development recognises that organisations involved in the management of the water sector, including the Ministry in charge of water affairs, other government ministries, state corporations, local authorities and private organisations have not been very successful in the management of water affairs due to institutional weaknesses “including poor organisational structure, inadequate funds, lack of personnel and shortage of essential facilities”. It therefore calls for the re-evaluation and re-orientation of the roles of the key actors in the sector within the context of a redefined role for the government in the water sector “with emphasis on regulatory and enabling functions as opposed to direct service provision”. This Sessional Paper whilst envisaging a role for non-state actors maintains that the ministry in charge of water affairs is responsible for co-ordination of all development activities and actors in the water sector, including establishing and monitoring the roles of non-state actors. This policy however synergizes with other policies and influences land use and land productivity. Water infrastructure for municipal water supplies has negatively affected downstream flow, therefore affecting irrigated agriculture providing an opportunity for the exploitation of landscape level resources like forests.

3.5.5 Fisheries Act, Cap. 378

In 1999 UNEP/UNDP identified uncontrolled and rapidly increasing fishing effort, uncontrolled spread of the water hyacinth and general degradation of the lake's ecosystem as fundamental problems facing the Lake Victoria fisheries. Today, eight years later, these problems persist despite collaborative efforts by different organizations. The Lake's fisheries have dramatically been transformed by untreated effluent spills, sediment and nutrient loading from the catchment and adoption of an export-based fishing approach. The Fisheries Act, Cap. 378 provides for the "*development, management, exploitation, utilization and conservation of fisheries and for connected purposes*". This Act also provides for cooperation between the Fisheries Department and other governmental agencies in ensuring synergy among different sector activities. Section 24 provides for financial assistance or other incentives to farmers in order to promote modern fishing methods. This ensures that fishing targets only mature fish and therefore sustaining the service. Section 15 makes it an offence for anyone to use explosives, poisonous or noxious substances or electric shock device for purposes of killing, stunning or disabling fish. In a review undertaken by UNEP/UNDP in 1999, it observed that the Act does not provide for incentives, though having the potential to shift fisheries management.

The Lake Basin Development Authority Act, Cap.442 is responsible for: i) plan for the development of the Lake Victoria catchment, ii) identify, collect, collate and correlate all such data related to use of water, iii) maintaining a liaison between the Government, the private sector and other interested agencies in the matter of the development of the area with a view to limiting the duplication of effort and to ensuring the best use of the available technical services; iv) render assistance to operating agencies in their application for loan funds if required and v) cause the construction of any works necessary for the protection and utilization of the water and soils of the area. It is the principal organization charged with overseeing and coordinating the development of the Lake Basin Development. It plays a facilitative and coordinative role for sustenance of ecosystem services. However over time the authority's resources dwindled and this affected its effectiveness.

3.6 Policies specific to Provisioning Services

Coffee, sugar and tea production has been steadily rising as indicated by Bundotich (still in preparation). These can be attributed to policy reforms in the three sub-sectors. Reforms in the coffee sub-sector include the licensing of commercial millers in 1994 reduced the monopoly held by the Kenya Planters Cooperative Union (KPCU) Ltd. The reduction of the minimum acreage required by a farmer to be registered as a coffee farmer from 10 acres to 5 acres increased the number of smallholders and production. The new Coffee Act, 2002 provides for: separation of the roles of regulation and marketing with Coffee Board of Kenya playing regulatory role, direct grassroots elections of CBK and Coffee Research Foundation (CRF) board members, removal of restrictive rules on coffee uprooting, planting and inter-cropping, provision of extension services by the private sector, establishment of coffee development fund and limitation of deductions to CBK and CRF to 3% of gross proceeds. Other initiatives which have influenced coffee production in Kenya include the implementation of the Second Coffee Improvement Project (SCIP II) and provision of STABEX funds to farmers. SCIP II project provided loans for input credit, training, factory development, advance payments, rehabilitation of coffee roads, electrification of coffee factories and building research infrastructure. Despite these positive reforms, farmers are still not allowed to trade in cherry at the farm gate level.

In the tea sub-sector, performance has increased because of good organizational framework, good tea prices and less disruptive liberation process. Tea Act, Cap. 343 vests marketing and licensing planting and cultivation to the Tea Board of Kenya. Previously Kenya Tea Development Authority²⁵, now an agency run by farmers, had exclusive right over extension services, processing and marketing of smallholder farmers.

²⁵ Established by the Agriculture Act, Cap. 318

Ongoing reforms, good prices of black coffee and the fact that Kenya is the largest exporter has increased production.

A discussion on Multilateral Environmental Agreements (MEAs) provides an overview of what has been provided for in the national action plans and mainstreamed through the different policy instruments. In the discussion below, these have been linked to ongoing activities aimed at achieving the objectives of the MEAs

4. Mainstreaming Multilateral Environmental Agreements (MEAs)

Since MEAs are not self-executing, national governments, Kenya included provide for their mainstreaming into national policies and laws through legislative procedures. Section 124 of the Environmental Management and Coordination Act, 1999 provides for the procedures and the roles of the National Environment Management Authority (NEMA) in mainstreaming MEAs. It states that under the direction of the National Environment Council, NEMA shall i) initiate legislative proposals to the Attorney General to give legislative effect to the provisions of a MEA; ii) identify other appropriate measures necessary for the national implementation of the MEA and iii) assist relevant lead agencies in negotiating environmental related MEAs. Often MEA provisions are inherently mainstreamed into national law without the mention of the MEA as in sections 42 and 50 for wetlands and biodiversity respectively. The mainstreaming of the MEAs provisions empowers the relevant authority or government agency to promulgate subsidiary legislation for their implementation. Provisions of the MEAs have also been integrated the National Action Plans.

A forum on, “the Development of Local Level Synergies between Environmental Conventions in Kenya” held on May 28-30, 2006 at the Silver Springs Hotel identified lack of joint programmes addressing the provisions of the various conventions and the need to integrate sustainable livelihoods into the initiatives undertaken by the conventions. A framework for doing this is however lacking. Anantha (2006) argues that the development of pro-poor markets for ecosystem services (MES) provide opportunities for achieving multiple objectives of the MEAs. MES have the potential of attracting funding from elsewhere including the private sector thus ensuring implementation. Anantha (ibid) further links the typologies of ecosystem services²⁶ with markets to the multilateral environmental agreements²⁷ and observes that given the financing mechanism for MEAs an enabling institutional framework for MES could easily be established. In order to reduce transaction costs associated with MES design and implementation, Anantha further argues for the creation of a bundled market²⁸ for the four typologies of ecosystem services.

Given upstream-downstream links, high rates of soil erosion, dwindling fisheries, high incidences of poverty linked to production for export market and loss of soil fertility in Nyando and Yala basins, elements of the United Nations Framework Convention for Climate Change (UNFCCC), United Nations Convention for Combating Desertification (UNCCD), Ramsar Conventions on Wetlands and the United Nations Convention on Biological Diversity (UNCBD) could be used to establish MES and vice-versa. Landscape transformation and associated consequences like sedimentation, flooding, pollution and the water hyacinth have affected biodiversity within Nyando and Yala basins. In the lowlands (e.g. *katuk kodeyo*) land degradation is rampant and therefore some elements of the UNCCD are applicable. Currently there are ongoing initiatives like food-for-work on land rehabilitation. Carbon offsetting initiatives are also being explored. Potential impacts of climate change include reduced food production, increased frequency

²⁶ Carbon sequestration, water quantity and quality, biodiversity protection and landscape beauty

²⁷ Markets for carbon and biodiversity fall within the scope of UNFCCC and CBD while those of water quantity and quality are linked to Ramsar Convention on Wetlands (see Anantha pg. 16, para. 3 for detailed list of the ecosystem services markets and links with relevant MEAs).

²⁸ A market for all the ecosystem services but with longer-term multiple benefits (see Anantha 2006 page 18 para. 5)

of stochastic events like droughts and floods and incidences of infectious diseases. Kenya is yet to finalize on its adaptation plan for the UNFCCC.

4.1 Opportunities provided by National Action Plans for adoption of MES

4.1.1 Synergies among the MEAs provisions and National Action Plans

There are synergies among conventions' provisions as well as in the national actions plans that are relevant in informing the creation of a bundled market for ecosystem services within the Nyando and Yala Basins. Article 11 for example, of the CBD requires parties to “adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biodiversity”. The Ramsar Convention also adopts “incentive measures that encourage the application of the wise use principle and the removal of perverse incentives” (Strategic Plan 2003-2008, Objective 8. In: Anantha, 2006). Consequently, requiring (COP7 Resolution VII.15) parties to share lessons and experiences on the design and adoption of incentive measures relating to wetlands, biodiversity conservation, and sustainable use of natural resources. Decision VIII/2 of COP 8 of the CBD advocated for collaboration with UNCCD secretariat to conserve dry and sub-humid lands biodiversity. It therefore emphasizes the need for joint work in implementing programs. Decision VIII.3 on *Climate Change and wetlands: impacts, adaptation and mitigation* of the Ramsar Convention points to the need to collaborate with UNFCCC in implementing joint programmes. Successful implementation of the Ramsar Convention is seen as contributing the achievement of the 2010 biodiversity targets. The MEAs also synergize one another in terms of tools and instruments for assessing the trends of ecosystem services. Particularly critical for the Lake Victoria Basin is the expansion of the scope of the Ramsar Convention to include the river basin management, allocation and management of water and use of groundwater and wetland conservation (Resolution VII.18, VIII.1 and VIII.40 respectively. Visioning wetlands in Lake Victoria as part of an integrated ecosystem provides opportunities for (as MA puts it): i) sustaining the wide range of benefits/services for human health and well-being, ii) protecting wetlands for hydrological significance, iii) maintaining the natural functioning of wetlands, and iv) securing wetlands in the context of Millennium Development Goals, especially 1 and 7.

UNCBD, Ramsar and UNCCD also recognize traditional knowledge and management practices of indigenous people and therefore have taken advantage of the opportunities it provides. Other synergies include provisions of financing mechanisms, awareness and involvement of local communities, developing and sharing environmentally sound technologies and know-how, emphasis on sustainable development and livelihoods.

4.1.2 National Action Plan for combating desertification

In Kenya's drylands, ecosystem services like food, woodfuel, freshwater resources, biodiversity conservation, carbon storage and landscape beauty are in different stages of degradation, as they are within the lowlands of Nyando and Yala basins. This is despite Kenya's ratification of the UNCCD in 1997. Traditional agricultural production continues to emphasize commodity production, increased yields approaches and maximizing net present value. The need to maintain dryland ecosystem as an interconnected whole, sustaining productivity over time while simultaneously considering tradeoffs with other dryland goods and services and exploring a range of future options is becoming urgent. Can the strategies provided through the NAP for combating desertification facilitative enough to promote work at ecosystem and landscape level and emphasize the adoption of strategies aimed at increasing the capacity of

drylands to provide goods and services for meeting people's livelihood objectives as well as linking with activities aimed at meeting the provision of UNCBD and UNFCCC? What do the NAP for combating desertification potent for the Lake Victoria Basin?

At the policy, legal and institutional levels, Land policy has been formulated with provisions for land use and tenure control. The Water Act, 2002, Forest Act, 2005 and in EMCA, 1999 have integrated provisions for community participation in managing dryland ecosystem services. NAP for combating desertification provide for strategies for changing people's attitudes, a system for early warning and building community-based institutions and alternative strategies. These have sparingly been implemented. A World Bank funded Arid Resource Management Programme²⁹ implemented by the office of the President is the most elaborate venture in this area. *Wei Wei* Integrated Development project in West Pokot that is funded through the program has led to diversification of food sources through irrigated agriculture, regeneration of biodiversity due to reduced pressure on the hill tops, increased awareness on the need to rehabilitate degraded areas, creation of farmers' association, replication of technologies by farmers, nurseries for reforestation activities, improved nutrition and 87 percent crop yields (UNEP, 2000).

Sector-based strategies provided for in the NAP for combating desertification are aimed at reducing reliance on woodfuel, protecting drylands fauna and flora, conserving dryland forests, and promoting agricultural production through soil fertility enhancing approaches and water resource management. These strategies are all aimed at restoring degraded ecosystems and associated services. The degrees of their achievement are varied and sector specific. Cross-sectoral strategies include mainstreaming gender, invoking the use of science and technology in understanding desertification, understanding the links between the state of the environment and poverty and instituting an early warning system for monitoring desertification and food security. NAP related strategies have been integrated into government programmes and budget systems ensuring regular government exchequer and donor funds.

4.1.3 National Biodiversity Strategy and Action Plan (NBSAP)

NBSAP related strategies systematically address each article of the convention starting with building institutional and individual capacities to financial resources. An analysis (see annex 2) of the links between NBSAP and the implementation of actual biodiversity activities by different stakeholders showed that:

- i) Different organizations at different levels are implementing different biodiversity strategies;
- ii) NBSAP is not linked to the reporting system. The reporting system adopts a targets- and milestones-oriented approach, but the NBSAP strategies are not. It has been recommended that the NBSAP be reviewed so as to be consistent with the reporting system;
- iii) There are no targets set for the country strategies and therefore not linked to the global targets under the convention's global targets;
- iv) NBSAP and the milestones used in the reporting system synergize other multilateral agreements (as indicated in annex 2);
- v) Links between NBSAP and ongoing processes, policies, projects and programmes have different implications for ecosystem services in Lake Victoria Basin as well as MES;
- vi) Mechanisms to ensure adequate incorporation of both market and non-market values of biological diversity into relevant plans and policies have been put in place including polluter-pays-principle and the charging for use of environmental goods and services, tradable permits, carbon offsets and environmental economic valuation instruments-these are provided for in the framework law, but they have not been translated into specific economic instruments for application purposes at the local or project levels;

²⁹ Covers ASAL districts like Turkana, Samburu, Marsabit, Isiolo, Baringo, West Pokot, Tana River, Mandera, Garissa, Moyale, and Ijara and focuses on irrigation agriculture, water, livestock improvement projects, education etc

- vii) Existing sectoral laws are sources of perverse impacts-e.g. in the transport sector they occur at planning level through land conversion (construction, parceling of habitats and increasing air and water pollution; and
- viii) Kenya faces a range of challenges in implementing the strategies provided for in the NBSAP. In Kenya's report for 2005, poverty, population pressure, unsustainable consumption and production patterns were indicated as the major challenges that the country is facing in implementing thematic programmes of work of the convention. Factors constraining implementation of programme of work include: lack of comprehensive data and information systems, inadequate policy, legal and regulatory frameworks, Lack of effective national regime on benefit sharing, inadequate integration of biodiversity into socio-economic development agenda, lack of adequate incentives for farmers and limited access to environmentally sound technologies

In Kenya, there have been initiatives aimed at building capacity to address the potential risks associated with technology transfer as per the Cartagena Protocol³⁰ Cartagena Protocol provides the rules for trade in genetically modified organisms and strengthens the application of the precautionary principle

4.1.4 The Ramsar Convention on Wetlands

The 1971 Ramsar Convention on Wetlands provides an intergovernmental framework for international cooperation and promotion of the wise use of wetlands. Contracting parties are obliged to organize, plan and promote wise use of wetlands and cooperate in the management of transboundary wetlands (e.g. for the case of Lake Victoria) (UNEP, 1999 and Ramsar Convention, 1971). The future of Lake Victoria is dependent on cooperation among the three countries of East Africa. In the Lake Victoria Basin, wetlands buffer the impacts of increased nutrients and sediment loads, spawning areas for fish, habitats of species and sources of materials of commercial value and protect local water supply resources (ibid). It has been observed that preserving the wetlands of Lake Victoria is important in preserving biodiversity and enhance the functioning of the lake as an ecosystem. Kenya being a Contracting Party has taken steps towards implementing the Ramsar Provisions. In the implementation of the guidelines for integrating wetland conservation and wise use into river basin management (Cop 7 Resolution VII.18 for example, the actions and targets set by KWS (MA) included: i) to create awareness and popularise the Ramsar guidelines among key natural resource users and management of institutions at National and local levels by 2005, ii) support education and capacity building among Regional Development Authorities to adopt Ramsar guidelines for their Planning purposes and iii) promote the guidelines among 20 percent of the relevant institutions by 2005. There is no information indicating the extent to which these have been implemented.

Strategies pursued at the national level included review of supra-national, national legislation and establishment of institutions relating to wetlands. Other sectoral legislation (Wildlife, Petroleum, Agriculture, Water, Fisheries, Urban Development and Settlements) are under review to ensure compliance with EMCA provisions and to integrate provisions for wise use of wetlands and associated ecosystem services. Water Act 2002 establishes institutions at different levels mandated to plan for sustainable water resource use, monitor water use, catchment protection and allocation of water for ecological sustenance. Kenya requires that economic valuations of the full range of services, benefits and functions of wetlands be prepared as part of impact assessments and for supporting planning decisions that are likely to impact negatively on wetlands. Economic valuations have so far been undertaken for Tana Delta and mangroves along the Kenyan Coast. Ahero and Mwea irrigation schemes are planned for economic valuation. Other projects that have been subjected to EIA included because of their potential impacts on important wetlands include Geo-thermal power production in Gilgil, Greater Nakuru Water project, Tourist Lodge

³⁰ Linked to CBD-Article 22 of the CBD requires partners to cooperate in developing capacities in biosafety

construction at Nakuru and horticultural farming in Naivasha. The global target is that by COP8, all CPs will have conditions requiring EIA for any actions that potentially impact on wetlands.

In the environmental assessments, surveys, inventories and the monitoring of wetlands by KWS, Lake Victoria is listed as requiring restoration/rehabilitation. LVEMP has adopted an integrated approach in addressing some of the land use related problems in the Basin, but not much has been achieved. The application of the polluter-pays-principle is touted as the best approach to solve pollution problems in Lake Victoria Basin. In the past local communities have actively participated in the restoration of Olbollosat, Naivasha, Nakuru, Bogoria, Baringo, Victoria, Saiwa swamp, Elementaita and Nyando and in implementing income-generating projects (e.g. eco-tourism guide and boat operating groups, pottery and basketry production groups, fisheries groups and associations in Lake Victoria). There are ongoing researches on indigenous knowledge and how it can be used for sustainable management of wetlands.

The private sector has been recognized as playing a crucial role. The Tourism sector/Hoteliers, commercial fisheries, Horticultural farmers and Ranches and industries close to wetlands have also initiated programs aimed at addressing pollution related problems. Industries in Nakuru have installed Release and Transfer Registers to monitor and control discharge of pollutants from their industrial plans.

4.2 Links among different MEA action plan strategies at the national level

Policies and legislation at the national level provide frameworks for of the national action plans (NAPs) for the different conventions. This allows funding from the national budget system. In order to see how the different convention strategies are implemented at the national level and how they influence the potential of MEA-markets for ecosystem services, national action plans have been analyzed (see table 2). Table 2 provides a good summary of the different activities under different strategies and what that means for the management for ecosystem services.

Table 3: Links among strategies and activities of the MEAs national action plans and implications for Ecosystem services in LVB

Action/strategy	Implemented or evolving activities under different convention			Implications for ES in Nyando and Yala basins
	UNCBD	UNCCD	Ramsar	
Strengthening institutional and community capacities	<ul style="list-style-type: none"> -National capacity self assessment done -Recommended review of the NBSAP 	<ul style="list-style-type: none"> -A Community Trust Fund established (Article 18 of UNCCD); -Database of CBOs implementing projects finalized; -Support given to local communities to implement NAP strategies; -Farmer innovations for food security, income generation, and combating desertification (Farmer field schools); -Creation of awareness on impacts of desertification; 	<ul style="list-style-type: none"> -Awareness creation & popularization of Ramsar guidelines; -Capacity building and education initiatives; -Production of outreach materials; -Community training and extension materials; -Training in basic monitoring techniques; -CEPA programmes established with 15 centres already in place; 	<ul style="list-style-type: none"> -Through capacity building initiatives, ES beneficiaries and modifiers know the values of biodiversity and water and their functions; -Biodiversity like fish in Lake Victoria and the sitatunga antelope in Saiwa Swamp rely on the state of the ecosystem to thrive; -Ongoing initiatives provide entry points for innovative approaches; -Capacity building initiatives can be designed so as to realize the objectives of the three MEAs as well as several multi-sectoral objectives
Strengthening and harmonizing national policies and legislation for effective conservation and biodiversity utilization	<ul style="list-style-type: none"> -Land use policy to address land use conflicts; -Biodiversity integrated in agriculture, poverty reduction, wildlife, forestry, ERS and PRSPs; and -Sectoral measures to prevent damage to biodiversity 	<ul style="list-style-type: none"> -Draft policies on land and ASALs; -Integration of NAP strategies into different policies (Water, forestry, PRSP, ERS, SRA etc); 	<ul style="list-style-type: none"> -EMCA, 1999 contain provisions on wise use of wetlands; -Several sectoral legislations under review; -Wetlands policy in the final stages of enactment; -Recently enacted Water Act has provisions for Water Users Association, Catchment and Sub-catchment Boards; -Inclusion of economic 	<ul style="list-style-type: none"> -EMCA, 1999 provide provisions that focus on the three MEAs-used as the principal legislation for that can guide a bundled market for biodiversity, water and supporting services; -Land policy will facilitate solution of problems related to tenure and subsequently the sustainability of interventions aimed at improved regulating and

			valuation as part of EIA;	supporting services Institutions: NEMA & devolved structures, National Wetlands Standing Committee, National Ramsar Committee and National Wetlands Forum
Undertaking measures to reduce impacts of poverty	<ul style="list-style-type: none"> -No targets at the national level; -Projects on local food security and health care targeting the poor; -Biological indicators for national use of inland water ecosystems developed; -Butterfly farming, closed seasons in fisheries and ecotourism programmes; -‘Banish Hunger from Kenya’ for food security and poverty reduction 	<ul style="list-style-type: none"> -Mainstreaming environment into development strategies for purposes of reducing poverty; -Diversification of livelihood systems and energy sources in the ASALs, 	<ul style="list-style-type: none"> -Community wise use projects for income generation being implemented; -Youth groups organized into functioning groups for wetland protection e.g. <i>Kipsaina</i> Youth Conservation group in Saiwa swamp, Pottery & basketry production groups Fisheries groups and associations in Nyando and Yala; 	<ul style="list-style-type: none"> -Several ongoing projects aimed at reducing poverty impacts on the ecosystem; -Ecosystem beneficiaries and users already organize themselves around the different ecosystem services providing good entry points for MES; -There is existing collective action aimed at conservation and use of ES; Existing challenges: Developing viable and alternative livelihood strategies for the rural poor
Strengthening national capacity for monitoring and evaluation	<ul style="list-style-type: none"> -Limited baselines of biodiversity at genetic level; -National Important Bird Areas Monitoring Scheme; -Marine, forests, ASAL and mountain biodiversity monitored; -No systematic monitoring at genetic level; -A disaster monitoring and management Depart in place –under president’s 	<ul style="list-style-type: none"> -Ongoing monitoring of the environment to improve technical capacity; -Strengthening drought monitoring centre in Nairobi; -Natural resource mapping and inventory in ASALs; -Indicators put in place for monitoring purposes; 	<ul style="list-style-type: none"> -Site management committees are in place and undertake monitoring jointly with the local community and the private sector; - 	<ul style="list-style-type: none"> -Robust monitoring systems can potentially catalyze innovative approaches based on severity of the problems; -Already built capacity can reduce potential transaction costs that can result from the establishment of MES; -Availability of data on different elements of the ecosystems not only reduce

	office			transaction costs but can also inform MES design;
Promote sustainable development activities in arid and semi-arid lands	<ul style="list-style-type: none"> -Implementation of cleaner production technologies; -CDM projects increasing forests cover; -On-farm agroforestry and afforestation programmes; -Community-based nurseries for rehabilitation; -DRSRS undertaking comprehensive assessments; -Game ranching by the maasai communities; -Gum arabica promoting alternative livelihoods; -Sustainable land management projects-rehabilitating degraded land and conservation of biodiversity 	<ul style="list-style-type: none"> -Several programs in place: NALEP, Desert Margins program and Arid Lands Development programme; -Pilot project on water harvesting in drylands; -Implementing projects aimed at reducing conflicts over resources; -Rehabilitation of degraded lands through donor or government support e.g. food-for-work programmes in Nyando and Lake Baringo Basin; -Communities encouraged to participate in poverty reducing projects; -Irrigation, water and livestock improvement projects through Arid Resource Management Programme 	<ul style="list-style-type: none"> -Water fluctuations, intensive siltation, loss of catchments forests and changes in hydrological patterns are obvious in some wetlands; -Management strategy for rehabilitating L. Victoria in Place (by LVEMP); 	<ul style="list-style-type: none"> -Regulating services (water) link the activities implemented to achieve the objectives of the three MEAs on arid and semi-arid environments; -Activities implemented under one MEA are multi-objective-can achieve objectives of other MEAs (e.g. tree planting have biodiversity and hydrological related significance); -Multi-objective interventions can be improved to realize livelihood related objectives; -Need initiatives has to be linked to ongoing successful initiatives and linked to achieving objectives of existing plans
National guidelines & regulations with respect to alien, invasive, GMOs, technology and biosafety	<ul style="list-style-type: none"> -No target and management plans for at least 100 alien species; -IUCN undertaking study of alien species for East Africa; -LVEMP has addressed this issue related to Eichomia crassipes; KWS control of Opuntia 	<ul style="list-style-type: none"> -Prosopis management research and control programmes; 	<ul style="list-style-type: none"> -Formulation of guidelines for wise use of wetlands; -Guidelines for enforcement of sectoral laws; -Saiwa Swamp invaded by Pennisetum grass species (affecting the endangered sitatunga antelope) due to siltation, agricultural run-off 	<ul style="list-style-type: none"> -Ongoing activities offer the basis around which a comprehensive strategy can be built to address plant invasiveness especially in Nyando and Yala where the ecosystem services are strongly linked to one another and the role of water in influencing the

	spp in protected areas;		and deforestation- Integrated management plan for Saiwa in place; -Hyacinth research and control programs in place	extent of invasiveness -Existing initiatives provide lessons for evolving initiatives
Support and promote the utilization of indigenous knowledge, innovations and practices	<ul style="list-style-type: none"> -No targets for use, protection of indigenous knowledge; -National Strategy on Indigenous Knowledge in place; -Documentation of indigenous knowledge -Policies on IK are being discussed; -Kenya Industrial Property Institute and NMK; -Strategy on Medicinal & Aromatic Plant species endorsed by policy makers forum; -Capacities of site support communities build in Kakamega, Arabuko Sokoke and South Nandi; -Strategy and Action Plan towards mainstreaming IK in Kenya 	<ul style="list-style-type: none"> -Indigenous vegetation project; -Cross border project-build capacities of communities to reduce biodiversity loss at specific hotspots; - Integration of IK in the promotion of technologies; 	<ul style="list-style-type: none"> -Local communities actively involved in the conservation and wise use of wetlands; -Collaborative ecological monitoring of wetlands with local communities; -Assessments of IK and practices undertaken; -Policies on application of IK being developed; -Promoted to form the basis of enterprise development; 	<ul style="list-style-type: none"> -Indigenous knowledge is crucial in the design and implementation of evolving forward looking initiatives; -IK being the basis for enterprise development and collective action and learning can link ecosystem services to poverty reduction; -It is around these ecosystem-based enterprises that new innovations like MES can be organized, but re-oriented to achieve sustainability; -Already built capacities can potentially catalyze action
Strengthening national ex-situ conservation facilities	<ul style="list-style-type: none"> -KEFRI, KWS, KARI, FD through Seeds for Life project are working on ex-situ conservation of ASAL species; -Seed banks established in KARI, KEFRI & NMK; 		<ul style="list-style-type: none"> -Exhibits and/or programmes that support non-formal wetland CEPA are in place; -Museum exhibitions in place in Kisumu, Eldoret, Kitale, Nairobi and 	<ul style="list-style-type: none"> -Bundled MES for regulating and biodiversity ecosystem services can potentially no. of ex-situ activities and related transaction costs;

	<ul style="list-style-type: none"> -A national genebank in place; -Botanical gardens in NMK, Egerton & Maseno University of threatened <i>taxa</i> 		Mombasa, KWS education centres in parks and reserves;	
Promoting sustainable utilization of the components of biodiversity	<ul style="list-style-type: none"> -Certification of biodiversity products e.g. timber, NTFPs etc; -Establishment of eco-tourism infrastructure; -Establishment of Marine reserves, man and biosphere reserves; -Identification of world heritage sites; -Identification of Ramsar sites; -Vibrant cottage industry using products from wetlands; -National ban on Camphor-Ocotea usambarensis -Companies dealing on biodiversity derived products 	-	<ul style="list-style-type: none"> -Tourism sector and hoteliers in wetland areas take measures to conserve wetlands and its biodiversity; -Commercial horticultural farmers and ranchers-formulate codes of conduct and IM plans; -Power producers recognize the value of wetlands e.g. Geothermal and Sondu Miriu; -Industrialists in urban areas already installing Pollution Release and Transfer Registers (PRTR) to monitor discharges; -Banning of DDT and effecting ban on fishing in Lake Baringo and Naivasha 	<ul style="list-style-type: none"> -Illustrate enterprise links between biodiversity and water related ecosystem services; -A bundled market for biodiversity and water can therefore be possible (e.g. bundling tourism, carbon sequestration, water and provisioning services in Saiwa Swamp) -Conditions are already in place that can provide catalysis for MES which can be used to offer alternatives (e.g. monitoring effluents, banning DDT and fishing)
Provide incentives	<ul style="list-style-type: none"> -Incentive based mechanisms like NNP lease program; -Application of polluter-pays-principle; -Some policies and legislation are sources of perverse incentives; 	<ul style="list-style-type: none"> -Desertification Community Trust fund providing funds to community activities for combating desertification -Some ongoing projects like food-for-work program in Nyando 	<p>Note: {these are linked to what is listed under sustainable utilization of biodiversity}</p> <ul style="list-style-type: none"> -Increased direct financial contributions by hoteliers; -Formulation of voluntary codes of conduct by private 	<ul style="list-style-type: none"> -Incentives are the core of bundled MES; -Existing initiatives provide lessons for MEA-based initiatives; -Provide opportunities for partnerships among ES users, beneficiaries and

	<ul style="list-style-type: none"> -Raising awareness on CBD and potential of incentive mechanisms; -Draft regulations on biodiversity conservation, access and benefit sharing awaiting adoption; -Benefit sharing mechanisms for wildlife conservation; -Incentives given to private sector to develop technologies; 		<ul style="list-style-type: none"> sector/companies; -Continued training and capacity building for the private sector; -Joint ventures-eco-tourism development, production of environmental information materials, mobilization of plans to implement integrated plans; 	<ul style="list-style-type: none"> intermediary organizations (i.e. the designated authorities for the different conventions) -Provide income for alleviating poverty; -Provide more funds for implementing the MEA related strategies;
Strengthening National Capacity for research and training, technical and scientific cooperation and biotechnology and regional collaboration	<ul style="list-style-type: none"> -KENRIK at NMK has developed a resource centre to document IK; -EIA curriculum developed by NEMA; -Networks established: Network on Medicinal Plants for East Africa, Eastern Africa Plant Specialist Group, Kenya Society for Ethnobiology, Nature Kenya, African Botanical Gardens Networks, SAFORGEN, EAFRNET, Kenya Agroforestry Network and Kenya Working Group on Medicinal & Aromatic Plants 	<ul style="list-style-type: none"> -IGAD hydrological cycles observation system in place; -Regional workshops on capacity building on monitoring and evaluation of programmes; -Developed methodologies for monitoring degradation, sustainable regeneration and restoration of woodlands; -Assessing and identifying roles of IK done; -Activities aimed at enhancing technology transfer are in place; 	<ul style="list-style-type: none"> -Undertook sub-regional training on wetland conservation and wise use; -Collaborative projects (e.g. Lake Victoria Conservation programme); -Ongoing training on economic valuation of wetlands; - Regional wetlands education and awareness needs established along major transboundary wetlands including L. Victoria; -Schools EPA programs through Wildlife Clubs of Kenya, KWS, NMK are in place and expanding; -Aquatic ecology taught in schools, colleges and universities 	<ul style="list-style-type: none"> -Methodologies for improving ES are already existing and can be used in designing MES; -Frameworks/institutions (potential intermediaries) to implement MES and its components are already existing; -Instruments (e.g. for economic valuation) have already been developed and capacity for their application put in place; -Frameworks for regional cooperation in managing ES are already in place (All these work together to reduce transaction costs associated with MEA-based MES

			<ul style="list-style-type: none"> -KWS Training Institute has a 5-weeks course on wetland management -New primary school curricula has a component on environment 	
Strengthening pollution control measures, impact assessments and integrated management approaches e.g. catchment/River Basin Planning	<ul style="list-style-type: none"> -Projects are subjected to EIA; -No plans to address the potential impacts of climate change on biodiversity; -Wetlands policy under preparation; -Joint policies to address shared ecosystems; -Involvement of communities; -Programs to enhance production of ecosystem services (e.g. seasonal fishing etc) 		<ul style="list-style-type: none"> -Regional Development authorities for promoting wise use of natural resources with the catchment in place; -Integrated management plans for various wetland ecosystems including for Lake Victoria and Naivasha; -Mountains and forests which are sources of important rivers have adopted integrated management approach; -Integrated Water Resources Management Strategy formulated; -Information on how do deal with oil spills , agricultural runoff and urban /industrial discharges,; -EIA requirements where there is change in ecological character of a Ramsar site because of development; -Lake Victoria wetlands requiring rehabilitation; 	<ul style="list-style-type: none"> -Initiatives aimed at improving biodiversity and water services are already in place; -Providing opportunities for a bundled MES for biodiversity and water as earlier discussed; -Severity, magnitude and extent of landscape transformation impacts on ecosystem services are evident given the responses; -Existing strategies provide the basis for a bundled market for water and biodiversity; -If the bundled MES is not formulated in a pro-poor manner, then ASAL related ecosystem services are likely to be ignored given their unexploited potential and especially in places that have no ongoing activities related to UNCCD or UNFCCC

Analysis of the actions plans vis-à-vis a few strategies shows that there are duplications of effort, links or similar activities pursued by different implementers and there are opportunities for implementing bundled markets for ecosystem services. Several issues related to these have been clarified in column 5 of table 2. One obvious bundled market in Nyando and Yala is for water and biodiversity. Interventions aimed at improving impacts of landscape transformation will potentially affect biodiversity as well as soil fertility, nutrient cycling, carbon sequestration and provisioning services as well. Successful design and implementation of a bundled market for water quality and quantity and biodiversity will provide the foundations and catalysis for integrated policy formulation and implementation.

5. Is the current institutional context a source of opportunities for bundled markets?

Policy and legislation formulation process is sectoral in nature. Over time, the urgency for multi-sectoral initiatives has been gaining momentum, but not tangible successes have been made. At the field level the focal points for implementation of government initiative are inadequate because of a myriad of structural, capacity and financial bottlenecks. Despite this government has designed and implemented successful programmes like NALEP and cooperatives societies providing institutional arrangements for technology transfer and adoption. Current policy debates and reviews provide excellent opportunities for integrated policy formulation, linkage with the MEAs action plans and design and implementation of 'forward looking' policies that embrace the principles and practices for achieving the twin goals of poverty reduction and sustainable environmental management. Regional cooperation initiatives like the East Africa Community Pact provide regional arrangements for tackling transboundary environmental related problems, especially in the lake Victoria Basin. They provide fora for collective action, collective learning, uptake and promotion of beneficial regional policy processes. These have the potential of sluggishly implemented, but with exploration of bundled MES for the different ecosystem services, it is possible to link existing knowledge system to action institutions through MES playing the roles of a boundary organization. This is only strengthened however in as much as the advice and support provided by intermediary organizations like United Nations environment Programme (UNEP) and the World Agroforestry Centre (ICRAF).

5.1 What needs improvement in the current process?

The policy formulation process in Kenya is not linked to any routine policy analysis cycle and there are weak and limited processes for promoting horizontal policy formulation mechanisms. Often policy formulation is reactionary and thus hurriedly undertaken and not informed by previous experiences. The formulation is seldom short-term and more on current 5-year development plans, crises, and economic adjustment programmes. The formulation process for Vision 2030 is an exception. The MEA national action plans also provide opportunities for long-term planning, but they are unfortunately influenced by what is happening at the global level. Greater harmonization of policy formulation mechanisms at district and national level would contribute to a more effective 'bottom up' policy formulation and implementation processes. Information inadequacies also affect the policy formulation process. Sometimes this is attributed to the lack of capacity to collate and integrate the bits of data and information which are available into packages which can be of immediate use to policy-makers. The need to use science-based evidence for decision-making is urgent and therefore MES could potentially provide opportunities for bridging science and policy.

6. Summary and Conclusions

This paper uniquely analyzed Kenya's environmental and poverty reduction policy framework and how it is likely to affect the adoption of integrated processes and the use of markets for ecosystem services in Nyando and Yala. This was done with special attention to the national action plans because of their binding

nature and the also to show how the various strategies have been implemented and their potential implications for MES. The national action plans linked to ongoing activities can indicate what is being done in relevant sectors and promotion of synergy. From this analysis it can be summarized that: i) different environmental policies and poverty reduction strategies (at macro-and micro-levels) negatively and positively affect integrated processes and adoption of MES, ii) the how of implementing the strategies so as to reduce negative impacts on ecosystem services are not clear and left to the district to decide plans, projects and programmes, iii) the translation of the national action plans for different strategies into activities are consistent with what is provided for in the plan, iv) the activities implemented to achieve the different MEA objectives synergize one another offering potential for adopting bundled MES, and v) MES provide opportunities for integrated policy formulation and implementation at different levels

A rapid assessment of PES and PES-like initiatives, their institutional foundations will enable conclusive remarks in this paper as well as the future for MES design and implementation in the basin.

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