Mainstreaming the Nexus Approach in Water, Food and Energy Policies in the MENA Region

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There are close linkages between water, food and energy. Policies for the three sectors need to be designed in a coordinated and integrated manner. An integrated nexus approach should therefore be adopted in order to ensure complementarities and synergies between the three sectors. This will support government efforts in the MENA region to follow a sustainable green path. Since the ultimate end is to achieve sustainable development, the three pillars of social, economic and environment sustainability have to be taken into account in developing the water, energy and agricultural strategies. Moreover, to that end, a series of specific objectives have to be tackled, such as the governance system, the regulatory framework, research and trade policy, public awareness and access to finance, among others.

Strategic Directions

Since water and energy are cross-cutting sectors, designing strategic plans and policies for them should be developed in close coordination with other economic sectors, including agriculture. Furthermore, since there are close linkages and relations between water, energy and food, strategies and policies for these three sectors should be closely developed in an integrated manner. In designing a sustainable development strategy, including the water, energy and food sectors, emphasis needs to be placed on investing in environmental infrastructure as a means of sustaining the ecosystem and the services it provides, and consequently provide the enabling environment for supporting sound economic development and social justice.

The emphasis on adopting a nexus approach should also be applied to diversifying the economy by creating new activities and business opportunities, efficiently allocating and using resources, enhancing competitiveness and market access of local products in international markets, and creating new job opportunities. This should also encourage waste avoidance and minimisation, reduced pollution and ecosystem degradation, and consequently improving the environment, human health and welfare.

Adopting a nexus approach should promote sustainable production and consumption patterns to contribute to reducing water, food and energy consumption and waste generation. It should be designed to facilitate the transition to a green economy,[1] and address climate change concerns at the national and regional level, and consequently contribute to achieving sustainable development.

Sectoral Directions for Mainstreaming the Nexus Approach in Water, Food and Energy Policies

Water policies should be designed to promote water efficiency and water saving techniques in food production and electricity generation, as well as expanding agricultural land vertically as well as horizontally. This includes the use of treated wastewater for irrigation of agricultural crops, subject to meeting health standards. Selection of water sources should be based on the opportunity cost of the various uses of the different sources of water – recycled sewage water, desalinated seawater, ground water – and cost of energy used (solar, wind, thermal, hydro, biogas, coal and nuclear) to produce it. Other measures include enhancing efforts to capture storm water, storage and use, introducing measures to recharge ground water with storm water and recycled wastewater, reducing the use of water content in the production of food and energy, and promoting water recycling and the reuse of treated wastewater. It is also essential to prepare a map of available water resources, including groundwater with exploratory wells. Other measures include increasing the net import of water through well-designed trade policies, ensuring sustainable use of water, including groundwater, and promoting water desalination using renewable sources of energy, condensation irrigation in the agricultural sector, cultivation of water saving and draught-resistant crops, and ensuring proper maintenance of water networks to reduce leakages and enhance efficiency in distribution.

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Regarding food, it is essential to introduce energy and water efficient and saving techniques in food production. This includes expanding agricultural land vertically as well as horizontally, with increased efficiency in the use of water and the use of water saving irrigation techniques, such as drip irrigation and pivotal irrigation systems. The use of hydroponic agriculture and condensation irrigation should also be considered. Other measures for sustainable agriculture and food production systems include improving cultivation practices and techniques to enhance crop productivity and reducing the use of water and energy per unit of produced crop, the selection of agricultural crops to be cultivated based on water consumption, as well as energy requirements needed for their production, and introductory measures to reduce food waste resulting from production processes, storage, transport and consumption.

The cost of energy should include the cost of water needed to generate it. Moreover,

1. As defined by the United Nations Environment Programme (UNEP), a green economy is one that results in "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities." The concept has been gaining worldwide recognition since its launch in October 2008, in the wake of the financial and economic crisis.

Workers handle an olive container in Morocco (EU Neighbours South).

policies should be designed to promote energy efficiency in the production of food and water. This includes the use of renewable energy for the production of water, water distribution, wastewater treatment and water desalination plants, and promoting the use of renewable energy in the cultivation of crops, irrigation systems, storage, food production and food processing and agro-food industries. Other measures include promoting the generation of energy from organic waste to include agricultural residues, municipal waste and wastewater, and the generation of energy from natural waterways and human-made waterfalls, and the movement of waves.

Enabling Conditions

The following are proposed measures that may be considered by MENA countries to promote the mainstreaming of a nexus approach in water, food and energy policies:

A Strong Governance System

- A strong governance system that promotes transparency, accountability, and stakeholder participation is essential in adopting and implementing a nexus approach that ensures efficiency and sustainability of the water, food, and energy policies.
- Fighting corruption is a necessary prereq-

uisite for a strong and efficient governance structure that facilitates the mainstreaming of a nexus approach in water, food and energy policies.

- Civil servants, including decision-makers, should possess the necessary managerial and technical capacities that enable them to analyse existing situations and challenges, assess opportunities and design policies that promote the implementation of a nexus approach for water, food and energy policies.
- Consider adopting a decentralised system of governance in order to provide the necessary flexibility for operating and implementing a nexus approach at the local level.

A mechanism should be designated to ensure proper coordination, complementarities, and harmonisation between different sectoral strategies, policies and plans

- A tight system of accountability and checks and balances should be introduced while designing, planning, implementing and evaluating a nexus approach.

Inter-Ministerial Coordination

- A mechanism should be designated to ensure proper coordination, complementarities, and harmonisation between different sectoral strategies, policies and plans. Priority should be given to designating an existing institution the responsibility of ensuring synergies and complementarities between different sectors, including water, food and energy. Alternatively, a High Council for Sustainable Development (HCSD) may be created to assume this function if current institutions are not able to assume this responsibility. HCSD may be attached to the Prime Minister's Office with representation from all ministries. Another council to include relevant stakeholders is also proposed to ensure continuous interaction and cooperation between the government and civil society, the private sector and academia.

Integrated Policy-Making

- Adopting a nexus approach should ensure that designed policies aim at achieving sustainability objectives across sectors, including water, energy, and food sectors, and consequently results in human welfare for current and future generations. This includes ensuring the economic viability, environmental resilience, ecosystems integrity and social justice of the proposed policies.
- Designed policies that promote an integrated nexus approach for water, energy and food should ensure efficiency in the allocation and use of resources, including waste prevention, minimisation, reuse, recovery and recycling.
- Social cohesion and equity considerations should be taken into account in the design and implementation of an integrated nexus framework for water, energy and food. Special consideration should be given to the underprivileged and marginalised communities in designing and implementing integrated water, food and energy policies.
- Designed nexus policies should aim at achieving inter-generational equity, ensuring that future generations do not bear the costs and negative implications of proposed policies. Moreover, policies should also ensure inclusiveness and equal distribution of benefits derived from water, food and energy for the different segments of the population.

Regulatory Framework

- Regulations provide a strong and effective means for designing and implementing policies. The regulatory framework should be developed in an integrated manner across sectors to ensure supportiveness of regulations to the different sectors, thus promoting

complementarities and avoiding duplication and contradictions.
- Regulations should be designed to ensure the integration of environmental and social considerations across sectors, including water, energy and food.
- Existing regulations should be revisited with new regulations introduced that promote synergies and complementarities between water, food and energy.
- A long-term vision and strategy supported by an effective compliance and monitoring mechanism ensures the effectiveness of a regulatory framework. A necessary prerequisite for an effective regulatory framework is a good governance system in order to ensure proper monitoring and compliance.
- Regulations should be designed to support market incentives in order to ensure their effectiveness and avoid conflict between the two policy packages.
- A regulatory system should be designed to encourage private sector engagement and investment in projects following a nexus approach.

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- A regulatory system should be designed to influence behaviour towards more sustainable patterns of production and consumption in all sectors, including water, food and energy.
- An assessment of the full cost and benefit of the designed regulatory framework that promotes a nexus approach for water, food and energy should be undertaken to ensure optimum returns on the economic, social and environmental fronts and ensure that sustainable development objectives are achieved.
- Certification for sustainably-produced goods, ecolabelling and environmental compliance certifications are possible interventions that can be introduced to encourage the adoption of a nexus approach.
- The introduction of green standards, certifications and codes should take into consideration the need to reconcile and harmonise water, food and energy policies, avoid inefficiencies and promote synergies.

Market-Based Incentives

- Economic instruments should be selected and designed to promote integrated policy-making across sectors, including water, energy and food in a supportive manner. Economic instruments include taxes, pollution charges, user fees, credits and rebates, R&D grants, subsidy reform and green subsidies. Other tools include feed-in-tariffs and payments for ecosystem service schemes (PES) to promote ecosystem and biodiversity conservation.
- Economic incentives should be designed to support command and control mechanisms. They should be carefully selected to promote integrated policy-making, complementarities and supportiveness between sectors, including water, food and energy.
- An incentive system should be designed to encourage private sector engagement and investment in projects following a nexus approach.
- The entire fiscal and tax system may need to be reviewed and reformed to support the adoption of a nexus approach, including shifting the tax burden from taxing jobs and incomes to taxing unsustainable practices in the water, energy and food sectors.
- The tax system should be designed to make the polluter-pays principle operational, reflect full cost pricing of natural resour-

ces, internalise environmental and social externalities, and promote more sustainable production and consumption patterns across sectors, including water, food and energy.

- Since subsidies contribute to the inefficient use and allocation of resources, measures should be taken to phase out subsidies, while fully taking into account equity considerations.
- The reformed subsidy system should encourage the efficient allocation and use of resources and discourage unsustainable practices. Such a reform will reduce pressure on government budgets and release financial resources to fund sustainable investments across sectors, including water, energy and food. It will also release funds to provide the much needed social services, fund environmental activities, and investments in human resources and R&D.
- It should be emphasised that the design of market-based incentives should fully take into account the social dimension, including the extent to which the incentive policy package creates jobs, promotes the equitable distribution of wealth and income and improves health and human wellbeing.

Human Resource Development

- Investing in human resource development is essential in making a qualitative shift towards integrated policy-making, green and sustainable development across sectors, including the mainstreaming of a nexus approach in water, energy and food policies. This is necessary to provide the needed calibres at all levels of managerial, technical and skilled labour.
- The education system at all levels should be reviewed to ensure the integration of social, environmental and sustainability considerations in the different disciplines and at all levels, as well as integrated thinking, policy development and adoption and implementation of a nexus approach in the water, food and energy sectors.
- Training, including vocational, should be promoted targeting different groups in the different sectors. This includes training for policy and decision-makers, managers, professional staff, practitioners and workers to support the development and implementation of an integrated nexus approach in water, energy and food policies.

Trade Policy

- Trade policies can be instrumental in encouraging the adoption of an integrated approach to the design and implementation of integrated water, energy and food policies by providing trade incentives and encouraging private sector engagement in these sectors.

Investing and trading in environmental and efficient water, energy and agricultural technologies contributes to the integrated and sustainable planning and management of resources. Trade policies should therefore be designed to promote the import and export of environmentally sound technologies in the water, energy and food sectors

- Trade policies should be designed to ensure the integration and complementarities of water, energy and food policies, as well as integrating environmental and social and equity considerations in the design and implementation of water, energy and food policies. Well-integrated water, energy and food policies that incorporate sustainability considerations promote resource efficiency and consequently the competitiveness of the products produced.
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be designed to promote the import and export of environmentally sound technologies in the water, energy and food sectors.
- Trade policies should be designed to maximise the availability of water resources.

Research and Development

- Provide sufficient budgetary allocations in MENA countries in order to allow for a research and development programme that supports the promotion of integrated water, energy and food policies.
- It is important to shift emphasis from relying mainly on outside technologies and know-how to strengthening national capacities to develop local technologies for local use and for export.
- The private sector should be encouraged to invest in R&D. This can be achieved through tax cuts and rebates and other incentives.
- Research and development should include research in water desalination and wastewater treatment technologies, water saving irrigation equipment and agricultural practices.
- Research in the agricultural sector should include water saving and draught resistant crops, water saving techniques and technologies, and agricultural practices that enhance productivity and output.
- Research in the energy sector should include renewable sources of energy, solar, wind and wave to produce cheap and more appropriate technologies that meet local conditions. Research should also include the use of renewable energy for seawater desalination and for producing energy from waste.

Access to Finance and Facilitating Investments

- Gradually redirecting existing financial resources towards green and sustainable investments that promote the mainstreaming of a nexus approach in water, energy and food policies.
- Intensify efforts to approach donors, since adopting an integrated nexus approach has a high potential for attracting technical and financial support from international and bilateral development institutions and donor countries.
- Introduce innovative financial mechanisms to encourage a nexus approach, which should include the introduction of soft loan programmes, credit schemes, hedge funds, social venture capital conditional grants, carbon credits, and microfinance.
- Financial tools should be used to stimulate local market demand by supporting consumer-based schemes to purchase locally-produced green goods, such as renewable energy, organic products and environment-friendly consumer goods.

Public Awareness and Information Dissemination

- Public awareness and information dissemination should be effective tools to support governments in defining, informing and conveying the benefits and significance of adopting an integrated approach for policy-making, including a framework for the water, energy and food nexus. This should clearly identify economic, social and environmental benefits from adopting a nexus approach.
- Transparency and information sharing are important for citizens to build trust and eliminate resistance to change. This can take the form of internet, social media, advertising and printed campaigns. They can also be in the form of educational materials, reports, flyers and brochures. Seminars, expert consultations and lectures are also possible means for outreach and awareness.
- Communication packages should be designed to address different target groups

in a simple language and in a manner that caters for their specific interests, priorities and concerns. These packages should highlight the importance of adopting a nexus approach in enhancing resource efficiency, attracting investments, generating new economic activities, diversifying economies and creating new jobs in the water, energy and food sectors.

Monitoring, Evaluation and Indicators

- Monitoring and evaluation should be part and parcel of the planning, decision-making and implementation processes of an integrated nexus approach. It is intended to ensure that the proposed policies are achieving their set objectives and allow for the introduction of the necessary corrective measures and actions, if need be to achieve the desired outcomes.

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- Assessment measures should be introduced to continuously monitor and assess the adequacy of nexus policies and the extent to which they result in ensuring synergies and achieve the desired outcomes from the economic, social and environmental perspective.
- Indicators supporting a nexus approach should be identified taking into account sustainability considerations.

Conclusion

Mainstreaming a nexus approach in water, food and energy policies is necessary in order to promote efficiencies and the sustainability of the water, food and energy sectors. In order to promote the adoption of such an approach there is a need to enhance awareness of the different stakeholders about the economic and financial gains resulting from adopting such an approach, in addition to the social and environmental benefits. A number of measures and policies need to be introduced to facilitate the adoption of a nexus approach, including a regulatory and incentive package, R&D and capacity development. A national mechanism should be designated to ensure coordination, implementation, follow-up, monitoring and evaluation of integrated water, food and energy policies.