EUROPEAN UNION

This project is funded by the European Union, implemented by CAREC in cooperation with IUCN, supported by EC IFAS

PROMOTING WATER-ENERGY-FOOD SECURITY IN CENTRAL ASIA

NEXUS BULLETIN # 1

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Published by: CAREC

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Created in 1948, IUCN is now the world's largest and most diverse environmental network, harnessing the knowledge, resources and reach of more than 1,300 Member organisations and some 13,000 experts. It is a leading provider of conservation data, assessments and analysis. Its broad membership enables IUCN to fill the role of incubator and trusted repository of best practices, tools and international standards.

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The Regional Environmental Centre for Central Asia (CAREC) is an independent, non-political and non-for-profit international organization with a regional mandate to assist the Central Asian states, regional and international stakeholders in addressing environmental and sustainability challenges across Central Asian region and Afghanistan.

CAREC was founded in 2001 by a joint decision of the five Central Asian states (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan), European Union and the United Nations Development Programme, following the resolution of the IV Pan-European Conference held in 1998, Aarhus (Denmark).

By promoting dialogue and collaboration among environmental stakeholders, CAREC has today become a leading regional knowledge hub in the field of environment and sustainable development recognized by national, regional and international partners.

CAREC works through five thematic programs: Water Initiatives Support; Climate Change and Sustainable Energy; Environmental Management; Education for Sustainable Development; Environment and Health.

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About the bulletin

This bulletin is a collection of short articles that allow the reader to get acquainted with the concept of the “Water, Energy, Food Security Nexus”.

The bulletin was prepared within the framework of the EU-funded Project "Central Asia Nexus Dialogue Project: Fostering Water, Energy, and Food (WEF) Security Nexus Dialogue and Multi-Sector Investment" (Nexus dialogue in Central Asia Project).

Through the eyes of local and international experts, the bulletin presents the WEF Security Nexus approach holistically, starting from its theoretical concept to practical application at different levels and scale, aimed at achieving multi-sectoral win-win solutions.

The bulletin also presents different activities that helped the project’s stakeholders to understand and apply the Nexus approach. IUCN experts offer their recommendations on this topic.

A review of the investment portfolio of WEF Nexus project ideas, developed as part of a multisectoral and transboundary dialogue, culminates the document.

The Nexus project team expresses its gratitude to its readers and hopes to continue the cooperation to achieve the WEF Security in Central Asia.

The Project at a glance

by Ludmila Kiktenko, Project Manager, CAREC

The Central Asia Nexus Dialogue Project: Fostering Water, Energy, and Food Security Nexus Dialogue and Multi-Sector Investment is a part of a global EU-funded program with other projects in Latin America, Africa, and the Middle East.

In Central Asia, the Nexus Dialogue in Central Asia Project is implemented by the Regional Environmental Centre for Central Asia (CAREC) in partnership with the International Union for Conservation of Nature (IUCN) since December 2016, with a budget of 1.3 million euro.

The ultimate goal of the Nexus Dialogue in Central Asia Project is to prepare the ground for investments that will be made in the frame of the forthcoming global EU Nexus Regional Dialogues Programme (Phase II). To this end, the current project supports the development of investment projects by the regional "Aral Sea Basin Program" (ASBP-4) through multi-sectoral national and regional dialogue and cooperation. The beneficiaries of the project are the International Fund for Saving the Aral Sea (IFAS) and state bodies in charge of water and energy resources management, agriculture, economic development, and environmental issues in all five Central Asian countries.

Need for a multi-sectoral approach

Population growth, regional socio-economic development, climate change as well as changing consumption patterns contribute to increased demands for water, energy, and food in Central Asia.

To achieve and safeguard WEF Security, it is important to understand the three sectors' interdependencies and inherent trade-offs to meet the needs of the diverse resource users. Multi-sectoral cooperation and planning provide a framework for incorporating and balancing the various interests of sectors sustainably.

In Central Asia, WEF Security is at the heart of socio-economic and human development. The need for the more integrated use of water, food and energy resources is recognized at the highest political level. And as the water and energy resources of the region are highly imbalanced, security in all three sectors can only be achieved through regional cooperation and a multi-sectoral planning approach.

IFAS as a key beneficiary

IFAS is the only intergovernmental body dealing with water and environmental issues at a regional level, advancing transboundary cooperation in Central Asia. It was established in the early 90s by the Heads of States of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan with the initial aim of funding joint projects and programs to save the Aral Sea and to improve the ecological situation in the surrounding area. Over the years, a socio-economic development focus at the basin level has emerged and was added to the environmental objectives.

On January 30, 2018, the IFAS Executive Committee decided to launch the development of the fourth edition of the Aral Sea Basin Program (ASPB-4). This decision, combined with recent. Presidents-level initiatives to enhance cooperation among the Central Asian States, is a unique window of opportunity for integrating the WEF security nexus into the ASBP planning process.
For information on the Global Nexus Dialogues Programme visit the:
https://www.water-energy-food.org/regions/central-asia/

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Introduction to Nexus

by Saltanat Zhakenova, Leading specialist, CAREC

From a series of papers on the Nexus approach to achieving water, energy, food and environmental security in Central Asia

Modern global trends, related to economic growth, population growth, urbanization and changes in the structure of consumption objectively result in the increased consumption of water, energy, and food. Increasing demand in the ecosystem services related to water and land, accompanied by an increasing pressure upon the environment, and complicated by the climate change factor, has long been of concern for researchers and managers. The individuals involved in the decisions to gain access to optimal methodologies and tools, which make it possible to assess not only compromises but also benefits of the synergies in the management of natural resources, have always been high. At the same time, scientific and practical research has not always been able to meet this demand, especially in developing countries.

In particular, theoretically and methodologically, the transition to the systemic or, so-called, integrated management of water resources was reflected in the Dublin Declaration adopted at the International Conference on Water and the Environment back in the year1992. Thus, one of the principles of the Declaration proclaimed the importance of a mass participation approach in the development and management of water resources and laid the foundation for understanding the interconnections between all types of water use in the context of socio-economic development and environmental sustainability.

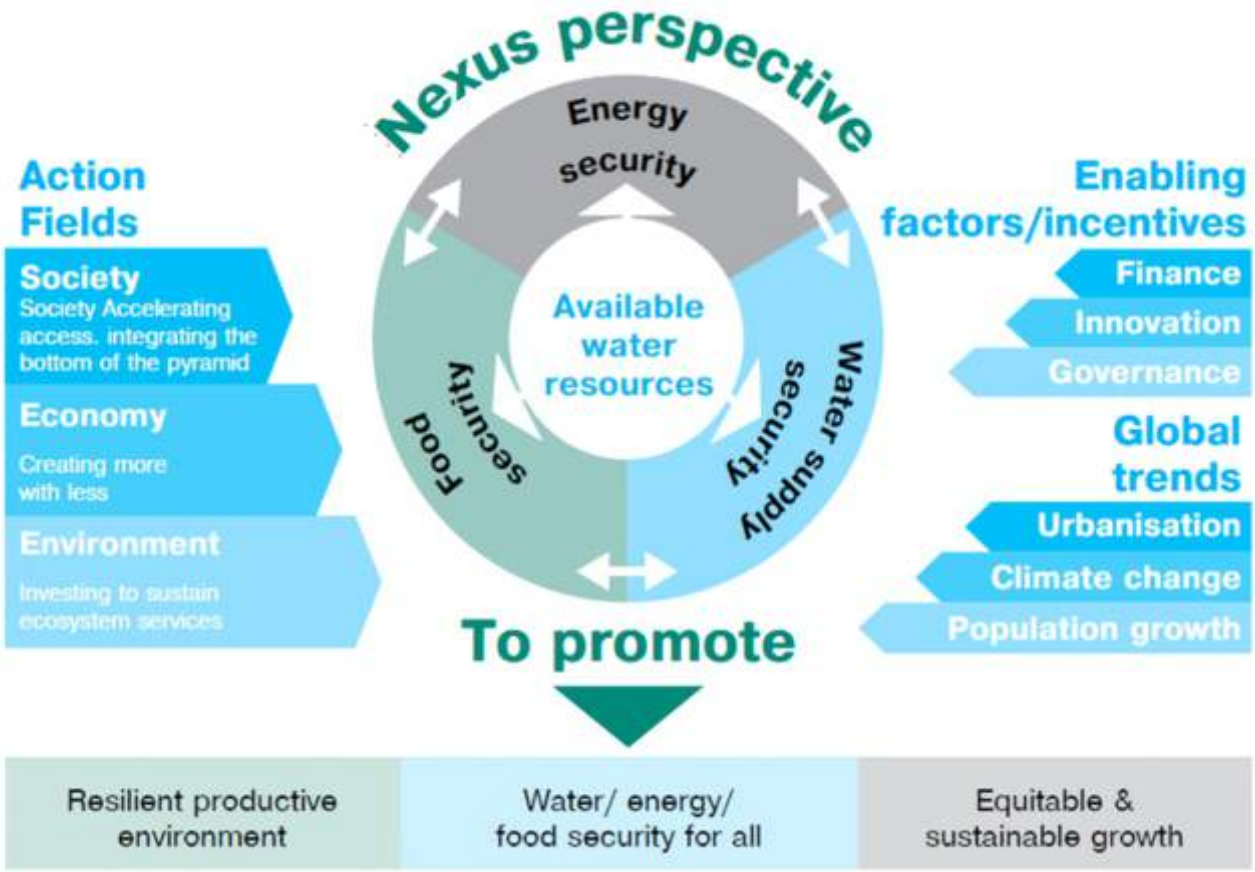
The next significant step in promoting the issue of the management of natural resources in its interconnection with economic growth and provision of basic services to the people of developing countries was the adoption of the eight Millennium Development Goals (MDGs), elaborated in the UN Millennium Declaration in the year 2000. Although this framework decision was not fully implemented, it allowed for the creation of new partnerships and highlighted the enormous importance of setting large-scale goals, based on intersectoral cooperation. The global financial crisis in the first decade of the 21st century, which triggered the food and energy crises in developing countries, led the world community to recognize the need to adopt interrelated solutions that are beneficial for the main sectors of the economy and contribute toward achieving water, energy, food and environmental security.

In several years, various scientific research papers, thematic discussions, and events led to an understanding of the need to consider the issue of interconnections on both research and political levels. As a result of this process, the International Conference “The Water, Energy, and Food Security Nexus: Decisions for the Green Economy”, held in Bonn on November 16-18, 2011, designated the water, energy and food sectors as the sectors with the greatest potential for mutually beneficial cooperation. At the same time, water was considered as the central element of the Water-Energy-Food (WEF) Nexus
(Pic. 1), being under the effect of global trends and requiring support measures.

Thus, the so-called WEF Triangle formed the basis for all subsequent studies of the existing Nexus interactions at the global, regional, sub-regional, national and local (basin) levels. International organizations as the European Union (EU), the United Nations Economic Commission for Europe (UNECE), the United Nations Environment Program (UNEP) and the United Nations Food and Agriculture Organization (UN FAO) analyzed the Nexus in the context of their mandate and, accordingly, analyzed herein additionalelements. For example, the UNECE and, subsequently, UNEP considered ecosystems as an essential element of the Nexus.

In this case, the ecosystems and the services derived from them were considered as a basis for ensuring water, energy and food security. At the same time, the World Business Council for Sustainable Development (WBCSD) analyzed WEF security in conjunction with components of business production as biomaterials, fibers, and seeds.

In 2015, the UN Sustainable Development Goals, which replaced the Millennium Development Goals were embraced by the whole world, explicitly call for intersectoral cooperation, coordination, and partnership within countries and regions, as one of the main factors for their realization. Thus, the concept of sustainable development, which stipulates the synergy of economic, social and environmental factors, has found its practical reflection through the interdisciplinary approach and tools.



Picture1. Prospects of the Water, Energy and Food Security Nexus.
Source: The Background paper for the Bonn 2011 Nexus Conference: The Water, Energy and Food Security Nexus, 2011.

Communicating about the nexus

by Dr Olivier Cogels, River Basin Management, and Water Diplomacy Expert

Securing sufficient access to water, energy, and food in order to permit what will soon be 10 billion people on the earth is a pressing challenge for all of humanity. To help governments and international institutions to make more optimal use of the, more and more, scarce natural resources, a new concept is gaining increased attention in the international community: the «Water, Energy and Food Security Nexus».

What does this concept mean to you?

«Nexus» simply means «interdependence». This concept highlights the fact that water security, energy security, and food security are inextricably linked. It means that investments or actions in one of these sectors have also implications in the other sectors. Hence, planning and management decisions to increase access to water, food, and energy, should be achieved and agreed in a more coordinated and integrated way.

What is the «Nexus approach»?

The «Nexus approach» is a multisectoral approach that takes this interdependence between sectors into account at all levels: from top-level policymaking and investment planning, to on the ground operational management. A smart approach that favors solutions that permit to produce more energy without threatening access to water and/or food. Offers Solutions that allow to secure availability of more food without penalizing the production of affordable energy. And last but not least, the Nexus Approach contributes to sustainable solutions that respect our environment. In other words, solutions that are based on constructive dialogue, listening to each other's needs and constraints.

What are the benefits of implementing the Nexus approach?

The benefits of multisectoral cooperation for increased water, energy, and food security leads obviously to more profitable investments and to more optimal management decisions. It also reduces the risks of conflicts between those who compete for scarce resources.

How do you see the potential of applying the Nexus approach at various levels in the future?

The Nexus concept is simple. But, translating it into reality is a complex challenge. Changing the way of policy-making and of managing institutions is indeed a long-term undertaking. At the national level, it, first of all, requires a strong political will. The will of reforming the well-established sectoral approach, of sharing information and working jointly on improving existing national policies and strategies. Although very challenging, this may have huge positive impacts.

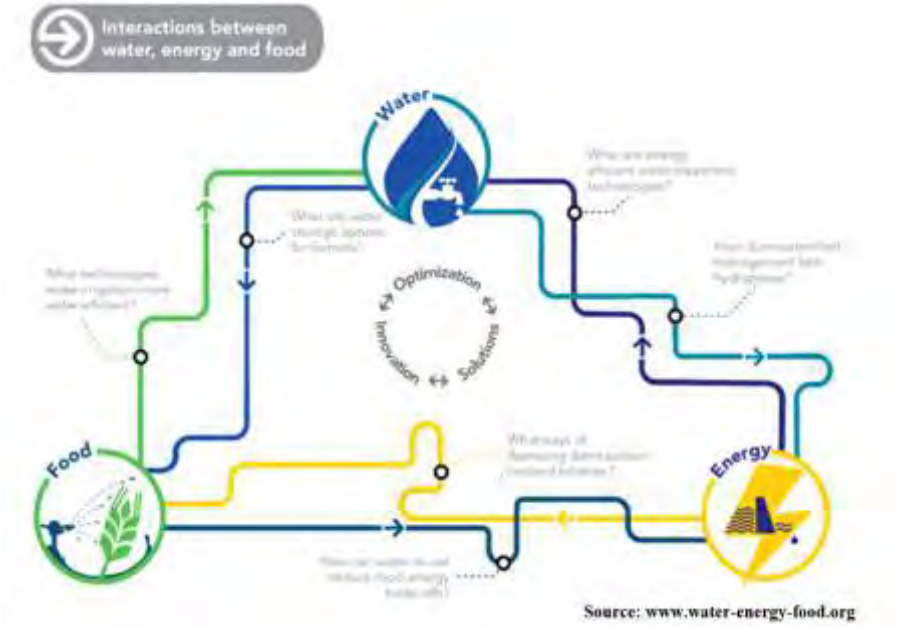
At the regional level, high-level conferences and summits can generate the necessary impetus, and provide valuable guidance. For basin organizations, multisectoral cooperation is already the usual way of doing business in the scope of the so-called Integrated Water Resources Management (IWRM). Simply stated, for the water people, the Nexus concept is seen as a part of the broader IWRM concept but with a more specific focus on the interdependency between water, energy, and food.

Finally, at the local level, applying the Nexus approach means above all more stakeholder dialogue and participation in the design and management of solutions to local water, food, and/or energy issues. A typical example is multi-sector stakeholder consultation for the building and operation of multipurpose dams.

Nexus mainstreaming through project planning

by Rustam Issakhojayev, Project Specialist, CAREC

The Water, Energy and Food Security (WEF) Nexus approach is a simple theoretical concept, yet challenging when it comes to its practical application as it depends on a great deal of understanding and acceptance by the practitioners. This approach is especially relevant to the Central Asian region, which shares a number of transboundary rivers and natural resources of high social and economic importance, used for multi-sectoral purposes. The WEF Nexus approach provides a fundamental shift from silo thinking to more coherent and cross-sectoral planning that allows taking into account the needs of each competing use of the same resource in an attempt to minimize trade-offs while ensuring ecologically sound and resource-efficient solutions.



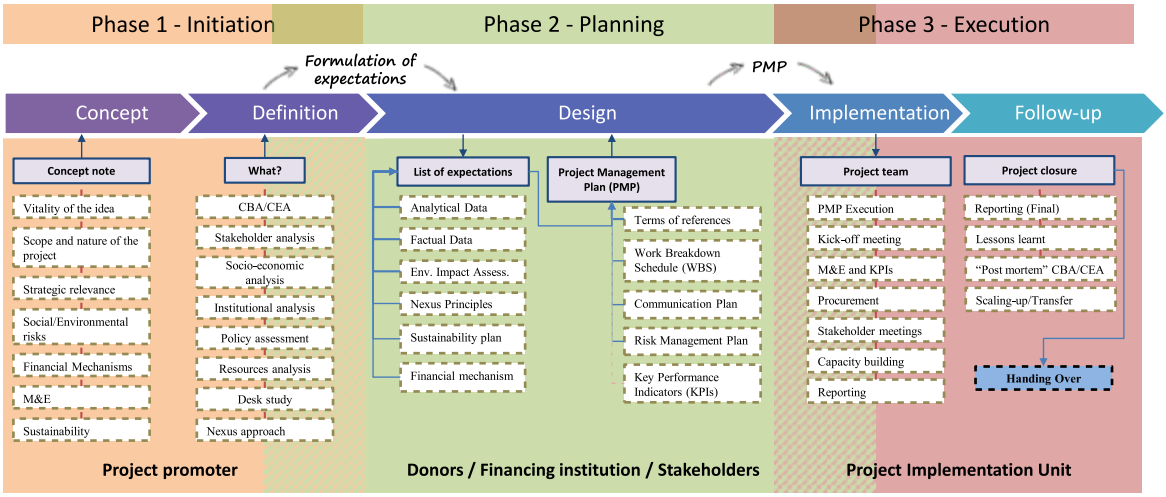
Picture 2: WEF Nexus Cycle

Within the framework of the Central Asia Nexus Dialogue Project: Fostering Water, Energy and Food Security Nexus Dialogue and Multi-sector Investment two policy briefs were developed to assist stakeholders in understanding the WEF Nexus approach from a theoretical and multidimensional perspective, while also providing practical guidance on moving project ideas towards comprehensive and well-planned project proposal.

A policy brief entitled “Why Nexus?” provides a historical overview of the WEF Nexus approach, its current state, its interlink with Sustainable Development Goals (SDGs), cohesion with Integrated Water Resources Management (IWRM) approach and relevance of the approach to Central Asia. The main objective of the policy brief is to convey to the reader that the WEF Nexus approach is in fact not a completely new concept, but rather one that has been discussed and forged for many years by both theoreticians and practitioners. Now, practical actions are required and the needs of all sectors relevant to the socio-economic development of the region will need to be represented and well balanced while preventing ecosystem degradation.

To support the elaboration of project ideas into project proposals that take into account infrastructure and socio-economic development, a second policy brief entitled “From ideas to shared benefits” was developed. The document focuses on two main topics: 1) Models and frameworks of assessing and incorporating a multi-sectoral approach; and 2) Overview of the project structure and its cycle with nexus thinking in mind. The idea behind this brief was to ensure that during the process of project proposal writing, a clear and consistent focus is being placed on

utilizing available funding for strategically significant and well-designed projects, especially of regional nature. This will ensure that projects maximize impact toward realizing national socio-economic development objectives in an environmentally friendly way. To this end a three-phase project structure formed the basis of the project management guide, as illustrated below:



Picture 3: Project cycle basics.

Presented WEF assessment models and frameworks are based on a study by Shannak et al.[1], who compared nine integrated natural resource planning and assessment models and elaborated different tools that can be used for assessing policy coherence, resources use effectiveness and efficiency, and most importantly, what is ought to be done in order to ensure multi-sector thinking.

Since the ultimate goal of the Nexus approach is to ensure that resources are used effectively and efficiently with minimal trade-offs and maximal benefits across all associated sectors, the above-mentioned documents can be used as a theoretical base for the further practical implementation of the WEF Nexus concept. They will ensure that benefits from the project intervention are assessed properly, especially when it comes to non-economic benefits.

Further information regarding project activities and documents visit:
https://carececo.org/en/main/activity/projects/nexus/
https://carececo.org/main/activity/projects/nexus/

[1] *Shannak, Sa'd, Daniel Mabrey, and Michele Vittorio. 2018. "Moving from Theory to Practice in the Water–Energy–Food Nexus: An Evaluation of Existing Models and Frameworks." Water-Energy Nexus 1 (1): 17–25. https://doi.org/10.1016/j.wen.2018.04.001.*

The nexus approach helps overcome challenges and potential institutional barriers that prevent holistic and integrated planning, decision-making and implementation of interventions, since it can be applied at any scale, as it involves a wider range of stakeholder perspectives, strengthens synergies, manages trade-offs and supports the negotiation of solutions that promote benefits for all involved sectors and states.

Benefits of Water-Energy-Food Nexus dialogues and planning

- Increased understanding of nexus linkages, including interdependencies between resources, sectors and policy processes
- Building of trust between stakeholders and sectors
- Sharing of data and best practices
- Forum for dialogue between diverse stakeholders
- Mutual learning and cooperative problem-solving
- Development of comparable standards and indicators
- Benefit-sharing and protection of ecosystems

In Central Asia, national multi-sectoral cooperation is in many instances insufficient in light of the fact that water, energy, and food, including agriculture, are inextricably linked beyond national borders. Cooperation, with the aim of achieving WEF security at the regional level, offers new opportunities. However, for these opportunities to emerge, common challenges need to be clearly defined and trust built. This needs to be supported by an enabling institutional environment.

As part of the institutional analysis, selected stakeholders in Central Asia were surveyed to gauge the institutional environment and understand which current legal frameworks may foster or hinder nexus dialogues, planning, and decision-making. Aimed at identifying regional institutional opportunities and challenges, the following topics were examined:

1. WEF security nexus awareness and understanding;
2. Aral Sea Basin Programme (ASBP) planning process;
3. Selection and implementation of regional ASBP investment projects;
4. Building an enabling environment in Central Asia.

The institutional analysis pinpoints to a number of challenges that need to be overcome in order to secure nexus thinking in regional planning processes:

- A lack of information and data sharing between Central Asian states: this is attributed to a prevailing lack of trust among the states as well as differences in the availability of reliable data.
- Key decision-makers lack experience with the nexus concept: increased understanding of the WEF Nexus approach and demonstration of its relevance through concrete actions and best practices is needed.
- Utilise existing multi-sectoral platforms to put the nexus approach into action: reforms are needed to ensure that the political and institutional environment enables nexus thinking, planning and investment, both nationally and regionally.
- Sources of financing for regional investment projects are insufficient: initiatives at the regional level are often based on political rather than economic considerations and priorities. Putting a greater focus on making ASBP investment projects bankable may catalyse blended financing, including from the private sector.

An enabling environment for nexus thinking

by Kristin Meyer, Nexus Central Asia Coordinator, IUCN

The Central Asian region experiences rapid demographic changes that suffer from water, energy and food insecurities and is highly vulnerable to climate change impacts. Insufficient actions taken at the national and regional levels to plan for and mobilise investments to address these multi-sectoral challenges can have undesirable consequences on people's livelihoods.

In light of increased competition for limited natural resources and complex, dynamic geopolitical developments that hamper multilateral cooperation, it is critical to find alternative approaches to single-sector solutions. Here, the nexus approach offers a powerful communication tool, serving as a catalyst to explore synergies for mutually beneficial and efficient use of human, financial, technological and other resources and provides opportunities for integration and negotiation of trade-offs. In Central Asia, however, the nexus concept is still in its infancy despite the fact that geographical specificities and imbalanced resource endowments make regional cooperation ever more expedient and critical.

Why is there a need for nexus in Central Asia?

- Global Changes increase socio-economic and environmental risks/vulnerabilities
- Sectors and states compete over limited natural resources
- Competition over limited financial resources and difficulties to attract investments
- Water-centric policy and decision-making hamper problem definition beyond the watershed
- Need for alternative pathways to arrive at solutions that achieve multiple objectives
- Bottlenecks in political economy and siloed budgetary arrangements
- Lack of benefit-sharing analysis across sectors and states
- Transboundary impacts of sector policies, decisions, and investments

Against this background, an analysis of regional institutional arrangements as well as a capacity needs assessment was conducted to identify priority areas and actions. While clarifying the relevance of nexus thinking in the Central Asian context, the two assessments provide specific recommendations towards multi-sectoral planning and decision-making with the ultimate goal of achieving water, energy, and food (WEF) security.

Currently, there is no agreed definition of the WEF security Nexus in Central Asia. This contributes to the observed unequal representation of the three WEF sectors in existing dialogue platforms at the regional level. It also means that opportunities for benefit sharing across sectors and countries, taking into account socio-economic gains and losses of different interventions, are not identified clearly enough. Elaborating an effective institutional framework that builds on existing structures and integrates all WEF Nexus sector perspectives will be key. It is clear that in order to safeguard socio-economic development in the region, comprehensive action by key institutions and stakeholders is indispensable. The results of the two assessments present actions towards this end.

Institutional arrangements

Regional historical, geopolitical and socio-economic realities in Central Asia are highly relevant in achieving WEF security. To generate the necessary political backing and ownership, all factors influencing water, energy and food security need to be examined in the choice of strategic nexus interventions. Often, institutional arrangements that favour sectoral planning and policymaking contribute to resource use conflicts and create contradictions of policy objectives.

Nexus Capacities

Capacity-building activities should form an integral part of a structured process that promotes nexus thinking in Central Asia and supports the creation of an enabling environment for new investments and implementation of nexus projects. Capacity building is key to providing organisations and stakeholders with the tools to achieve water, energy and food security goals in a sustainable manner. Appropriate, tailored and targeted institutional capacity building facilitates the creation of an enabling environment for effective negotiation of trade-offs, joint decision-making, financing and implementation of strategies, programmes and projects that incorporate nexus perspectives and approaches. Additionally, capacities need to be strengthened at the individual level in order to promote the use of appropriate tools and methodologies to drive informed nexus decision-making, prepare nexus project proposals and implement nexus interventions.

The assessment conducted in the frame of the Project, allowed to provide recommendations for targeted capacity building on WEF Nexus planning and implementation of strategies, programmes and projects at national and regional levels. A self-assessment tool, the Nexus Capacity Scorecard, was used to gather quantitative data on existing capacities and to produce a baseline for the analysis. The use of a Nexus Capacity Scorecard, supplemented with information gathered during training workshops, nexus dialogues, the nexus study tour and other stakeholder engagements in Central Asia, allowed capacity building needs to be identified.

Overall capacity was found to be low in all dimensions. Although capacities vary between sub-dimensions, overall, the scores point to a need for more concrete, structured and strategic capacity building interventions to establish and anchor WEF nexus thinking and processes in the Central Asian region.

Dimension 1 - Governance and decision-making

- Conceptualising multi-sectoral investment projects
- Implementing multi-sectoral investment projects
- Building consensus among all stakeholders

Dimension 2 - Institutional frameworks and processes

- Developing methods, indicators, incentives and standards
- Integrating environmental and social safeguards

Dimension 3 - Knowledge creating, information and data sharing

- Mobilizing information and knowledge
- Generating and sharing data knowledge between stakeholders and sectors

Dimension 4 - Monitoring

- Monitoring, evaluating and reporting

Dimensions of capacity need assessed

Based on the assessment, a capacity building plan was developed, illustrating institutional, organisational and individual capacity building actions in the short-, medium- and long-term to create an enabling environment and foster the integration of nexus thinking into Central Asian investment planning.

The findings of the capacity need assessment further served as the basis for the development of a draft Nexus Roadmap for Central Asia. The Roadmap reflects achievements of Phase 1 of the Central Asia Nexus Dialogue Project and informs the planning of Phase 2.

OUTPUTS	OUTCOMES
1. A schedule of indicative nexus investments (through the six-step process) prepared	1. Key stakeholders understand nexus principles 2. Nexus principles mainstreamed into planning 3. Stakeholder agreements in place
2. Institutional capacity building was undertaken	4. Institutions committed to and aligned with nexus principles
3. A dossier of investment options prepared 4. A nexus financing model (for CA) developed	5. Increased water, energy and agricultural security in Central Asia

Expected outputs and outcomes of the Nexus Roadmap for Central Asia

What's next?

The need to take a step-by-step approach to introduce nexus thinking and application in Central Asia remains. An effective institutional environment and governance structure are particularly important if the WEF Nexus is to be fully rooted in Central Asia. However, this will depend largely on the willingness of key actors of the three WEF sectors and individual states to cooperate towards a common goal to ensure water, energy and food security. The required commitment will only develop over time, as capacities and institutions are strengthened.

As aforementioned, the institutional analysis recommends a number of immediate steps to ground nexus thinking in Central Asia and to enable institutional change conducive to multi-sectoral planning and decision-making, summarised under five broad headings:

- Understanding the WEF nexus approach;
- Demonstrating WEF nexus application in Central Asia;
- Overcoming water-centric planning and decision-making;
- Enabling political and institutional environment;
- Develop and plan multi-sectoral investments.

These steps are intended to strengthen the WEF security nexus in the region and to create the necessary institutional enabling environment. The capacity development plan developed as a result of the capacity needs assessment report supplements these steps with relevant capacity building actions to promote nexus perspectives across institutions, organisations and individuals. The recommendations derived from these two assessments, provide important background for the planning of Phase 2 of the Central Asia Nexus Regional Dialogues.

The power of best nexus cases

by Kristin Meyer, Nexus Central Asia Coordinator, IUCN

To showcase how increased returns on investment opportunities can be achieved by applying a nexus approach, best practices of the Water-Energy-Food (WEF) Nexus were collected in the form of several case studies. The best practice cases focus on water, energy and food security dimensions that advance socio-economic development and propose the nexus. With water becoming increasingly scarce in relation to the demands upon it, the requirements for water are also changing as economies diversify. At the same time, finance for much-needed infrastructure is becoming increasingly more difficult to secure given the economic demands for more growth and development.

The selected case studies cover a range of WEF security concerns for a variety of key stakeholders linked with these sectors and are assessed through a Stakeholder-Problem typology that summarises challenges across the Central Asian region. Apart from lessons learned, each case study includes an explanation of its relevance to the region. The case studies are:

1. The Zambezi Basin: A multi-sector investment opportunity analysis;
2. The Volta River Basin: Trade-off analysis for transboundary infrastructure investment planning;
3. Multiple sector use of irrigation infrastructure across Asia;
4. Nexus approach in the Senegal River Basin;
5. Agribusiness as natural infrastructure in the southern African region;
6. The Rhine River Basin: Multi-stakeholder cooperation;
7. Water Hyacinth control in South Africa: A multi-benefits analysis;
8. Solving inefficient irrigation in Indonesia.

A better understanding of the WEF Nexus approach allows for the shortcomings of single-sector approaches to be addressed and fosters brokering of compromise, trade-offs or synergies between competing interests in the use of resources. The selected case studies provide insights from other regions of the world and offer important lessons learned that support the Central Asian region in designing interventions and planning for investments that help achieve WEF security. However, the case studies do not produce a comprehensive catalogue of methods, tools and approaches. Every nexus intervention needs to be designed and planned within the specific context and supplemented by concrete awareness raising and targeted capacity building.

The case studies include examples of multi-purpose infrastructure, which offer a convincing way forward, where social and environmental externalities are better integrated into design and investment, and benefits of investments are shared across more than one sector. Therefore, considering the interlinkages between water, energy and food/land management sectors, the WEF Nexus approach is likely to:

- **Reduce** the pressure online ministry budgets because investment costs are shared with others, as well as better risk identification and joint mitigation;
- **Increase** the economic returns on a given investment because of the multiple benefit streams that can result from multi-sectoral investments focused on multiplier effects from investments and improved management.

By learning about practical examples and applications of the WEF Nexus approach in other regions, the project stakeholders are encouraged to adapt the newly gained knowledge to the unique context of the Central Asian region and plan for multi-purpose investments as well as consider linkages and synergies between water, energy and food sectors.

The selected case studies were used to develop a number of possible future scenarios for Central Asia which are aligned along two key axes: (i) the extent to which institutions are strengthened and mandated to adopt a more transboundary approach; and (ii) the extent to which planning remains trapped in siloes or has been redirected onto a more multi-purpose, multi-sector basis. Scenarios are a powerful way to raise awareness of likely outcomes of different courses of action, or indeed of non-action.

In the context of Central Asia, to mainstream the WEF Nexus approach, the following will be essential:

I. At the **national level**, WEF Nexus perspectives need to be strengthened and incorporated into national policies, strategies and plans, capacities and bottom-up approaches that need to be increased and local solutions to regional nexus problems sought.

II. At the **regional level**, it will be necessary to develop regional development objectives through dialogue and negotiation, share benefits across the entire Aral Sea Basin and strengthen regulatory frameworks for joint decision-making.

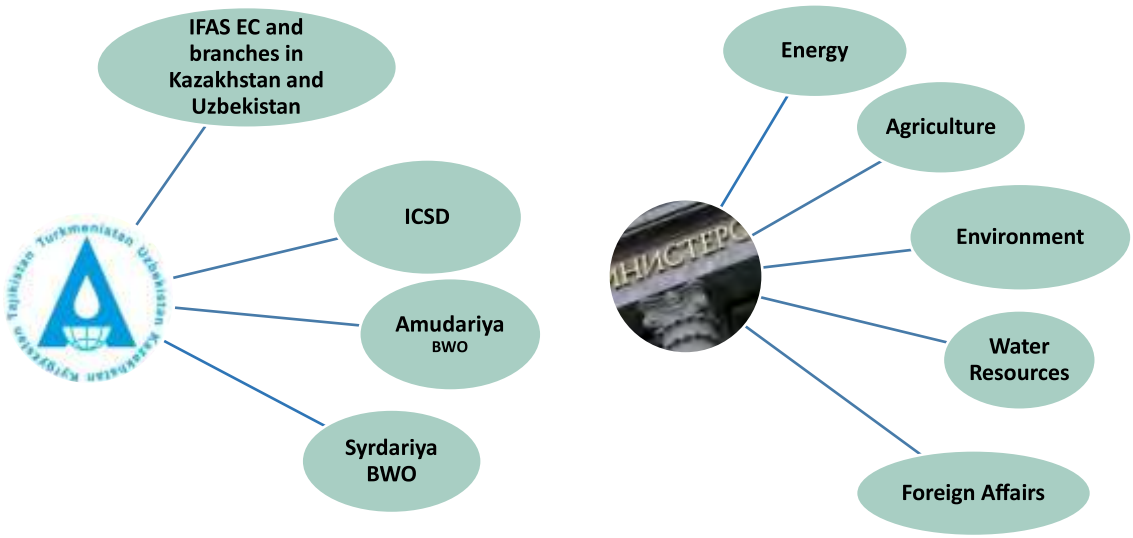
The scenarios further indicate where vertical linkages between the national and regional levels are possible to support the Central Asian region in its efforts to apply nexus approaches to address issues of WEF security.

By learning from case studies, relevant institutions, public and private sectors have the opportunity to advance their understanding of the cause and effect relationships as they execute their mandates and implement policy actions and reforms.

Learning from Danube and Sava River Basin Management Experience

by Aksulu Kushanova, Project Specialist, CAREC

In May 2019, a visit from a delegation from the Central Asian countries to Vienna (the Republic of Austria) and Zagreb (the Republic of Croatia) was conducted within the framework of the 'Central Asia Nexus Dialogue: Fostering Water, Energy and Food Security Nexus Dialogue and Multi-Sector Investment' project, funded by the European Union. This allowed the participants to learn from the European experience on the issue of transboundary basin management, specifically the case of the Danube and Sava transboundary river basins. The delegation included senior officials from different sectoral ministries and regional Aral Sea basin management organizations.



Picture 4: Composition of the Central Asian delegation

The objectives of river basin organizations in Europe are different from those of Central Asia. The main challenge for the European region is floods and water pollution from sewage and agricultural waste, whereas issues regarding availability and distribution of water resources are at core management objectives in Central Asia. However, water management challenges of any kind require cooperation, particularly when transboundary waters are involved. Hence, the conducted study tour was insightful, enabling participants to better grasp the legal and institutional rationale, and the overall approach to transboundary cooperation in a European context.

The delegation from the Central Asian countries spent a week discussing various topics with both the International Commission for the Protection of the Danube River (ICPDR) in Vienna, and the International Sava River Basin Commission (ISRBC) in Zagreb. These two commissions shared their experience of developing relations between varying riparian countries to manage water resources, a process that started in the 1990's when geopolitical changes introduced a new basis for cooperation. In the case of the ISRBC, the collapse of the Socialist Federal Republic of Yugoslavia, led to the formation of new independent states[2]. With this, the Sava River, which had been a national river for five decades, acquired an international status overnight. Additional complications arose due to the fact that the Sava River is one of the main tributaries of the Danube river (12%) thus making Sava River riparian countries also part of the Danube river basin, highlighting the need for harmonized water resource management activities throughout the region.

In a first step, the countries of the Danube River Basin focused on the preparation of legal documents, including 'The Convention on Co-operation for the Protection and Sustainable Use of the River Danube', which was ratified originally by twelve riparian countries. The 'Framework Agreement on the Sava River Basin' was also ratified by all four countries through which the Sava river flows. The riparian countries initiated this dialogue on transboundary cooperation without interventions or support from any international organization.

[2]*Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro, FYR Macedonia (since 2019 North Macedonia)*

Legal documents were drafted simultaneously both at the political and technical levels. In the case of both institutions, articular attention was paid to technical issues, requiring the involvement of key experts from each riparian country while decisions were taken only with the consensus of all technical experts. These two conventions became one of the first regional agreements after the 90's. The case of the Danube and Sava basins clearly demonstrated that cooperation became possible only after the legal arrangements, clearly defining dispute settlement principles as well as territorial delimitation of river basins, had been signed.

"We provide a platform for cooperation and technically sound dialogue. It is particularly important for infrastructural projects. Instead of political battles, we conduct a dialogue".

(Ivan Zavadsky, ICPDR Executive Secretary)

To implement the legal arrangements made the ICPDR, seated in Vienna (Austria), and the ISRBC, seated in Zagreb (Croatia), were created, both having a clearly defined structure with more technical than administrative staff. The Technical Experts at the ICPDR Permanent Secretariat are selected by the Contracting Parties but paid from the regular budget of the Commission, made out of regular contributions of all Contracting Parties. It is worth noting that all analytical work is performed inside the Commission by experts themselves.

Both commissions also have an administrative budget funded by each of their respective member countries on an annual basis. Contribution amounts are adjusted according to the level of economic development of the member states, which vary significantly. Accordingly, countries with an economy in transition have a lower financial commitment. The annual budget of the ICPDR is slightly above 1 million Euros allocated to the management of the Danube River Basin; whereas and ISRBC has a budget of approximately 500 000 Euros. The operations of ICPDR are fully funded by the contracting parties. Information exchange within the Danube and Sava river basins is done through the channels of the Commissions, where countries provide information upon request and is, in some cases, verified.

Picture 5: Beginning of the study tour with the ICPDR in Vienna
Source: CAREC

[3]*Austria, Bulgaria, Czech Republic, Germany, Hungary, Slovak Republic, Slovenia, Romania and five countries that are not part of the EU: Bosnia and Herzegovina, Moldova, , Serbia, Ukraine; Croatia and Montenegro accessed the Convention later.*

[4]*Republic of Slovenia, Republic of Croatia, Bosnia and Herzegovina, Republic of Serbia.*

The blueprint for the text of the Danube River Protection Convention was the UNECE Water (Helsinki) Convention. According to the EU Water Directive all EU members and potential candidates should achieve 'good ecological status' of all surface waters issues by 2027. The EU supports the Commissions, also with minor grants to provide technical support to their work.

Gradually, the commissions also started acting as platforms advising governments, the community and the private sector. For example, the ICPDR prepares recommendations for improvements of agricultural policy at the regional level to improve the quality of water resources while avoiding infringing upon the economic interests of farmers. In addition, during recent consultations on the development of the Action Plan for the Danube River Basin, the public provided over one hundred suggestions that had to be considered. It is worth noting that the commissions seek to bring different sectors together, particularly those with potential conflicts of interests, e.g hydropower and navigation.

Picture 6: Presentation by the participants in Zagreb at the ISRBC
Source: CAREC

The key take-away from the study tour was that the riparian countries successfully take responsibility for their region and implementation of respective tasks by means of regional cooperation. The legal and institutional frameworks play an important part and their efficiency is ensured by political will and directives, primarily those of the EU. Availability of an annual budget, nominated national experts and a permanent institutional structure ensures continuous and consistent operations. This is not to say that there are no problematic issues in the visited basins. Indeed, they struggle particularly in respect to ensuring fulfillment of hydrologic and agricultural capacities of countries with lower GDP. Nevertheless, the study of the case showed that the countries always try to resolve such matters by means of consensus and dialogue. More detailed technical report on the experience of two Commission can be found at CAREC website, Nexus Project web page.

Piloting the WEF Nexus approach in Central Asia

by Aksulu Kushanova, Project Specialist, CAREC

To test the WEF Nexus approach, small-scale pilot projects were implemented in three countries of Central Asia with the support of state authorities and regional organizations of Central Asia. Each project met certain national priorities for socio-economic development. Thus, in Tajikistan, a methodological manual for the operation of reservoirs was developed, in Turkmenistan, the modernization of sardobes was carried out, and in Uzbekistan, the energy efficiency of state pumping stations was assessed.
Despite the differences in the problems raised by the pilot projects and their uniqueness for each country, the projects were selected and implemented with a multisectoral approach in mind.

Pilot project on water reservoirs in Tajikistan

Currently, there are eleven operational, large water reservoirs in Tajikistan with a mirror area of 664 km2 and a total volume of 15,3 km3, constituting 13% of the annual runoff of the Aral Basin rivers. The largest water reservoirs are the Nurek, with a total volume of 10.5 km3, located in the central part of Tajikistan and Bahri Tajik, with a total volume of 4.16 km3, located in the northern part of Tajikistan.

Nurek water reservoir

Dam of Nurek HPP

Kairakum HPP

Picture 7: Water reservoir and hydroelectric power stations in Tajikistan
Source: Ministry of Energy and Water Resources of the Republic of Tajikistan

Tajikistan's endowment with such large water reservoir areas is explained by its geographical characteristics, located in the upstream reaches which host some of the largest glaciers in Central Asia. There are more than 14 000 glaciers in Tajikistan, which occupy about 6-8% of the country's total area. Glaciers of Tajikistan contribute to more than half of the runoff of the largest rivers in the region: the Syr Darya (46%) and Amu Darya (65%).

Large water reservoirs accumulate water both for irrigation and for hydropower production in Tajikistan, supplying over 90% of the country's energy needs. Water reservoirs also play an important role in regulating river flow for its rational use in the interests of the economies of riparian

countries. This significance of reservoirs is becoming more apparent against the ongoing climate change. The water reservoirs play also an important role in flood prevention and protecting national strategic facilities against the destructive effects of floods, which is common in Central Asia.

National legislation requires the development of operating rules for each water reservoir individually. Yet, as of today, standardized rules developed during Soviet times are still in use. In response, the pilot project supported the development of a methodology for water reservoir use in Tajikistan. During the development of these customized methodologies, a multisectoral approach has been used, actively involving specialists from water, energy and agriculture sectors. The methodology offers a single calculation justification, including for water management, water energy and environmental estimations, which is particularly useful given the multifunctionality of water reservoirs.

Reconstruction of dew mounds in Turkmenistan

Desert occupies up to 80% of Turkmenistan's territory. Water resources mainly include surface runoffs of rivers that are formed outside the country. Compared to other countries of Central Asia, the level of precipitation is the lowest with about 190 mm per year (in comparison, Tajikistan gets up to 700 mm per year). Therefore, different ways of collecting and keeping the water in desserts play an important role and are considered as an important source of water.

One of such kind of water preservation is dew mounds are locally known as sardobes, hydraulic constructions that consist of a pool buried in the ground and covered with a stone arch for collecting and storing rain and groundwater. From the Persian translation, sard means “cold” and вb means “water.” Sardobes have been known since the 10th century AD and were common in Turkey, Iran and the Central Asian states. Since that time, they had strategic importance. Sardobs provided water along the caravan route of the Silk Route and were therefore subject to vigilant protection.

At present, sardobes can play an important role in livestock farming, in particular in grazing. Sardobes are state-owned and their use is free for farmers. Most part of the livestock is owned by the private households, who do not have specific assigned pasture territory that they can use and who, accordingly, is not responsible for the maintenance of natural pastures that are owned by the state.

Over the past decades, many sardobes have been dilapidated causing many livestock farms to abandon pastures due to a lack of water. This has led to a significant degradation in grazing areas that have available drinking water for livestock and an overall decrease in the livestock.

Picture 8: View of a traditional sardob

The Nexus pilot project supported the rehabilitation and reconstruction of sardobes in the Dashoguz velayat for the "Garagum" livestock farm. These sardobes have been fallen into disrepair over the past 30 years, and pastures within a radius of 30-35 km are unused despite the availability of feed. In addition to the construction work on the sardobes, solar panels were installed nearby the shepherd's house. The benefitting livestock farm "Garagum" contributed both financially as well as by providing necessary labour during the implementation of the project.

As a result of the project, the number of livestock in the livestock farm will increase to 6,000 heads, while previously overused pastures are given the chance to restore over 3-4 years. In the context of Turkmenistan, where half of the country's population live in rural areas and is mainly engaged in agriculture, but pastures occupy up to 90% of agricultural land, and 3.5% of irrigated land. Therefore, the project allowed to free up valuable and rare agricultural lands by making distant land areas suitable for cattle-breeding, mainly breeding of sheep and camels.

Picture 9: Photos of sardobes before reconstruction

On average, only 12% of available pasture territories in Turkmenistan are used due to insufficient or uneven watering. For example, in the Dashaguz Velayat, where a pilot project was implemented, pasture productivity is 0.8-0.9 centner per hectare and only 36% of the area of Dashaguz Velayat has access to water. This is one of the lowest rates in the country.

The contribution of agriculture, forestry and fisheries to the country's GDP has decreased from 33% from 1990 to 9% in 2015, which is partly explained by a growing water shortage and degradation (salinization) of irrigated lands. Due to livestock overgrazing, the rate of pasture degradation is ever-growing, affecting over 50% (according to experts' calculation) of the total area of all pastures of Turkmenistan. The WEF Nexus pilot project has contributed to ensuring food security while also contributing to an improved environment and socio-economic development of the rural population.

Picture10: Pastures of Turkmenistan
Source: Photo is borrowed from Natural pastures and development of transhumance livestock in Turkmenistan, 2014

Increasing the energy efficiency of Uzbekistan's pumping stations

The socio-economic importance of agriculture is significant in Uzbekistan. In 2017, the share of agriculture to the national GDP was around 17,%[6] providing employment to more than half of the country's population, mainly in rural areas.

Despite efforts by the Government of Uzbekistan to develop and diversify the agricultural production and exports to less water-intensive crops (from cotton to fruits and vegetables) in the frame of the Decree of the President on measures to improve the public administration system in the field of agriculture and the resolution on improving the activities of the Ministry of Agriculture of the Republic of Uzbekistan, large territories are still used for growing water-intensive crops like rice and cotton. Important advances were made in Uzbekistan's agricultural sector and the country has attained not only food self-sufficiency but also shows the potential for export of many agricultural products, mainly vegetables, fruit and cotton.

Picture 11: Data collection on energy consumption

Picture 12: Filling and transfer of data on energy consumption by pumping stations

The total irrigated area of the Republic of Uzbekistan is 4.3 million hectares, mainly located in four districts. Due to the county's landscape, irrigated areas are unevenly distributed and located mainly in the lower or foothill areas far from the main riverbeds, requiring more than half of the irrigated lands to be supplied with water by pumping stations. Most of the pumping stations are on the balance sheet of the Ministry of Water Resources of the Republic of Uzbekistan (about 1,700 units) with a total capacity of 3.8 million kW, the productivity of these pumping stations is about 7000 m3/second.

[6] https://stat.uz/en/press-center/news-committee/2855-gross-domestic-product Only in Tajikistan is agriculture more relevant for the national GDP with 28%, while all other Central Asian states show much lower values (CIA World Factbook 2019).

At the same time, pumping stations are energy-intensive, with an annual energy consumption of 8 billion kWh, or about 15% of Uzbekistan's annual electricity generation. Hence, the bulk of the energy used for agricultural needs is consumed by pumping stations. The cost of the energy supply of pumping stations makes 70% of the budget of the Ministry of Water Resources. Even though a monthly limit is set for the energy consumption at the pumping stations, in some areas there is a shortage of electricity or excessive consumption.

The WEF Nexus pilot project supported the Ministry of Water Resources of Uzbekistan in conducting a technical assessment of pumping stations in the country and developing an investment proposal for the installation of automated control and monitoring system for electricity consumption. The developed documents helped substantiate the inefficient operating costs of pumping stations from an economic and technical point of view and provide recommendations for improving the power consumption of pumping stations. During the development of documents, the relevant ministries for energy, water and agriculture worked closely together and considered ways to improve the operation of pumping stations through a multisectoral lense, taking into account the interest of all three relevant ministries. This was particularly important because the Ministry of Energy sets monthly limits on electricity consumption, while the pumping stations themselves are owned and maintained by the Ministry of Water Resources, and the main consumer is the agricultural sector.

The introduction of the Automated System for Monitoring Electricity Consumption (ASMPE-NS) was proposed as one of the least costly and most efficient solutions. In addition, an investment business plan was developed and presented to the central government and potential investors. Expected expenses for the creation and implementation of the ASMPE-NS amounts to 9.545 billion Uzbek Som (approximately 1 million US dollar). The estimated annual energy savings due to the introduction of ASMPE-NS is 0.5% (40 million kW). With that, the payback period is only 2-2.5 years.

The introduction of ASMPE-NS will also generate multiple indirect benefits. Employees of pumping stations will be able to use their working time more efficiently, since now more than 70% of employees' time is spent on transportation between pumping stations, collecting, analyzing and sending consumption data via a telephone message. At the same time, the environment will improve due to reduced electricity consumption.

Picture13. The large pumping station in Uzbekistan
Source: Ministry of Water Resources of the Republic of Uzbekistan

Learning to apply the WEF Nexus approach

by Rustam Issakhojayev, Project Specialist, CAREC

Integrating well-structured and easy to understand capacity building activities into a project design is paramount in ensuring that ideas and concepts are understood and further used by the trainees during planning and decision-making. The results of the Capacity Needs Assessment report prepared by the International Union for Conservation of Nature (IUCN) identified that capacity-building activities in the form of theoretical and practical trainings are needed to bridge the existing knowledge gap and further promote the WEF Nexus concept in Central Asia. With the above in mind, a draft WEF Nexus Regional Training Concept was designed by the Phase I Nexus Dialogue in Central Asia Project team. The concept aims to better demonstrate the interdependencies of all three WEF sectors, as well as other interlinked socio-economic sectors and therefore benefits intended socio-economic development outcomes, the achievement of Sustainable Development Goals while at the same time responding to global environmental trends. Additionally, for the training to have a long-lasting effect, the training modules were designed in a way that provides participants with the opportunity to apply Nexus thinking via case studies and the Nexus Game, both offering ways to illustrate regional applicability.

Specific objectives of the training are to:

- Strengthen the understanding and increase awareness of the WEF Nexus approach;
- Provide theoretical and practical information on the benefits of the Nexus approach, as well as practical guidance on the incorporation of the concept during the development of projects through a variety of tools and case studies;
- Build capacity of the involved institution and stakeholders to address the WEF related regional challenges and lay the groundwork for investment opportunities;
- Promote coordination among relevant institutions and actors at the national and regional levels.

The training consists of two interdependent two-day modules and provides a comprehensive insight into the WEF Nexus approach, from a theoretical and practical perspective. Each module is divided into specific thematic sessions.

Module 1: Introduction to the WEF Security Nexus [7]- introduces the concept of the WEF Security Nexus and provides an overview of the different interdependencies of the water, energy, food and environmental sectors across different scales. This allows trainees to gain a deeper understanding of the Nexus concept as an integrated and holistic management approach for decision-making processes. It provides information on tools and strategies to implement the Nexus approach in planning and communication processes across sectors and different levels, keeping investment opportunities for Central Asia in mind. The module further offers practical examples and group work exercises. The final part focuses on policy and governance instruments for implementation, including policy frameworks and approaches to policy coordination.

Module 2: WEF Nexus - Roadmap for Central Asia - builds on the information presented in the Model 1 and provides participants with an overview of the WEF Nexus approach, explains the investment environment and requirements, equips participants with the investment project selection criteria and introduces practical work based on best practices applicable to Central Asia. The module also allows participants to experience the planning aspect of the WEF Nexus approach in the controlled environment through the Nexus Game by simulating the different roles of key decision-makers of the country. Players are divided into two groups, to represent upstream and downstream countries, both of which have access to the same river but different quantities of resources. Both sides strive to address food, water, energy demands of their respective populations, while at the same time responding to climate change and pollution aftermath. The game helps to draw interconnections between food, water and energy in the context of security and sustainability at the transboundary level and allows players to get a feel of the decision-making process and diplomacy.The ultimate goal of the Regional WEF Nexus Training Concept is to ensure that participants understand and are able to use nexus-oriented infrastructure investment planning, that benefits water, energy, and food sectors while keeping the environment in mind.

[7]This training module was adapted by the EU Central Asia Nexus Dialogue project: Fostering Water, Energy and Food Security Nexus Dialogue and Multi-Sector Investment funded by EU and implemented by CAREC and IUCN from the training materials developed by the GIZ Nexus Regional Dialogues Programme in cooperation with the Institute for Technology and Resources Management in the Tropics and Subtropics (ITT) of the Cologne University of Applied Sciences (https://www.water-energy-food.org/).

Experience playing the Nexus Game

by Aksulu Kushanova, Project Specialist, CAREC

At the Central Asian Leaders Program on September 18, 2019, in Almaty, thirty representatives of line ministries and educational communities from Central Asia and Afghanistan took part in the Nexus board game for the first time. This game made it possible to practically introduce the water, energy and food security Nexus (WEF Nexus). About 60% of the players were not familiar with this approach prior to the game.

The full Nexus Game takes up to 5 hours with stimulation of five different scenarios. Due to time constraints, the project team adapted the game so that it would not take more than one hour by stimulating 2 scenarios only: rainy and dry situations followed by investment decisions made respectively by upstream and downstream countries. In spite of the complexity of the game at first glance, the participants quickly picked up the rules and were actively engaged in stimulating and heated discussion on how to allocate the available resources. The game illustrated well-known issues and conflicts between upstream and downstream countries, the downstream countries, for example, did not want to accept the pollution from the upstream countries. This resulted in tensions, even between the players during the simulation Game.

By taking the roles of the Minister of Agriculture, Energy and Water, the participants were faced with important decisions in the tradeoffs between water, energy and food sectors. In most cases, they fell into the common pattern of thinking only about one sector, but that is not how to win this game. This way the nexus approach had to be used to find multisectoral solutions.

All three groups actively negotiated, bartered and proposed joint construction and management solutions of transboundary water facilities and found ways to benefit from the comparative advantages of upstream and downstream countries.

Overall, the participants experienced, in reality, the interdependence between the sectors and trade-offs and synergies between competing uses of water, land and energy-related resources.

Picture 14: 10th CALP 2019, Nexus session, 16.09.2019, Almaty, Kazakhstan
Source: CAREC

Participants praised the potential of such an approach in promoting the Nexus thinking and regional cooperation, as different game scenarios forced each player to make decisions with a multisectoral impact. The evaluation showed that the game increased the knowledge about Nexus of 99% of the participants and 100% concluded that the Nexus approach should be considered also in real life. To enhance the knowledge about Nexus, the participants proposed to use more stimulation games, social networks, nexus case studies and practical examples, capacity building and introduce it at the academic level.

(Source: https://www.water-energy-food.org)

Picture 15: 10th CALP 2019, Nexus session, 16.09.2019, Almaty, Kazakhstan
Source: CAREC

Preparation of Nexus investment project portfolio

by Ludmila Kiktenko, Project Manager, CAREC

The preparation of a portfolio of regional investment projects aiding water, energy and food security in Central Asia, was a priority of the first phase of the "Nexus Dialogue in Central Asia" project, funded by the European Union.

To this end, the Nexus project arranged and supported intersectoral consultation meetings at the national and regional levels. National line ministries are responsible for the management of water and energy resources, economic development and agriculture, the representatives of the Executive Secretariat of the International Fund for Saving Aral Sea (ES IFAS), Water Basin Organizations "Amudarya" and "Syrdarya", Secretariat and Scientific and Informative Center of the Interstate Commission on Sustainable Development, as well as experts from the Central Asian countries participated at the said consultations. The coordination process was carried out through the Regional Steering Committee (RSC) of the Nexus project, consisting of national authorities and members of IFAS.

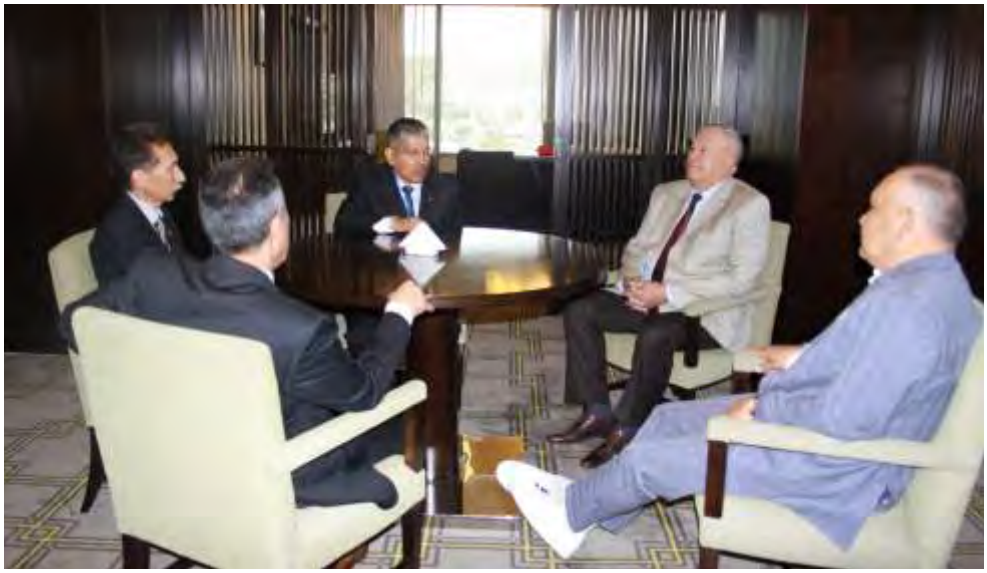
Picture 16: The first meeting of the RSC, 13.03.2018 in Tashkent, Uzbekistan
Source: CAREC

Initially, the investment project ideas were identified based on national strategic plans and programs. As a result, a list containing 21 projects of national importance was compiled. In an effort to identify regional projects, including projects that entail transboundary cooperation between two or more countries, projects with potential transboundary impact and projects representing mutual interest, the Nexus projects reviewed the progress in the implementation of the third Aral Sea Basin Program (ASBP-3), a programme brought to life by the Heads of Central Asian States in 1994 to improve the living conditions of the people in the region by protecting the environment taking into account the interests of all the states in the region.

A team of independent and recognized experts from Central Asian countries, led by Dr. Ibatullin S.R.[8], in close cooperation with the line ministries and regional organization, compiled the Nexus Investment Ideas Portfolio of project ideas out of those ASBP-3 projects that had not yet been realized and which complied with criteria of the Nexus approach.

Picture 17: The third meeting of the RSC, 09.10.2018 in Astana, Kazakhstan Source: CAREC

The portfolio comprises projects addressing key challenges of the Aral Sea basin, particularly focusing on water resources management, restoration of reclamation lands, combating desertification and the consequences of natural disasters, but also on water and energy supply in rural areas, thus contributing to water, energy and food security in Central Asia.



Picture 18: Nexus project partners Source: CAREC

[8]Ibatullin Sagit Rakhmatulaevich – Doctor of Technical Sciences, Professor, Corresponding Member of the Kazakh Academy of Agricultural Sciences of the Republic of Kazakhstan, Vice-rector for scientific work and international relations of Taraz State University named after M.H. Dulati, Director of the Research Institute of Water Management, 2008-2013 - Chairman of the Executive Committee of the International Fund for Saving the Aral Sea.

Portfolio of investment project ideas

DIRECTION 1: Integrated water resource use

- Project №1.1 «Upgrading and introduction of an automated water resource management system and sustainable operation of hydro-technical installations of interstate significance in the Syr Darya River Basin» (project owner: WBO «Syrdarya»);
- Project №1.2 «Enhancing the reclamation condition of irrigated land in the Amu Darya and Syr Darya River Basins» (project to be determined);
- Project №1.3 «Safety of dams and other hydro-technical installations in Central Asia: capacity building and regional cooperation» (project owner: WBO «Syrdarya»);
- Project 1.4 «Improvement of water resource management in the Amu Darya River Basin by rehabilitating and upgrading water management facilities and enhancing interstate legal framework» (project owner: WBO «Amudarya»).

DIRECTION 2: Environment protection

- Project №2.1 «Rehabilitation of ecosystems in the Aral Sea Basin to combat desertification and land degradation» (project owner: Executive Board of IFAS in Kazakhstan);
- Project № 2.2 «Integrated disaster risk management in the Aral Sea Basin» (project owner to be determined).

DIRECTION 3: Social and economic development

- Project №3.1 «Ensuring sustainable water and power supply to rural communities of Central Asian countries» (project owner: ICSD SIC in Turkmenistan);
- Project № 3.2 «Integrated development of eco- and agro-tourism with ethno-tourism elements in especially protected nature areas (EPNAs) in the Aral Sea Basin» (project owner: Executive Board of IFAS in Kazakhstan).

The implementation of the compiled investment projects has the potential to generate economic benefits to the population and countries of Central Asia, with a number of project ideas having commercial potential that will allow testing new financial mechanisms, including the development of joint funds and Public-Private Partnership schemes.

For almost every project idea different agencies have taken the responsibility for further design and implementation. A few of the project ideas were also included in the ASBP-4.

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