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Transition to a Green Economy Model and Innovations in Water Management in Kazakhstan

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Concept on Transition to Green Economy and the State Water Programme to 2040

- Adoption of the Concept on Transition to Green Economy (President of RK);
- The Concept is based on 7 pillars; water is Pillar # 1 – State Water Programme (till 2040) was adopted to address the water dimension, problems and challenges in the water sector (incl. impact of climate change);
- Key issues: expected deficit of water resources, by 2040 (if present trends continues, no new policy); the need to drastically increase water use efficiency, foremost in agriculture; the need to develop resource base and increase capacity of reservoirs for strategic storage of water;
- To address the issues, CWR and *KazVodKhoz* undertakes the following measures:
 - Protection of water resources (from depletion and pollution)
 - Regulation of river run-off and Transfer of water to water-stressed areas and basins using main canals and pipelines
 - Water allocation to key water-users: water abstraction and non-consumptive uses: hydro-electric station (HES), fishery, recreation etc.



Key measures and investment projects

- Preventive measures against water-related disasters (floods, ground water flooding, land erosion and salinity etc.)
- **Key investment projects, funded from IFI loans attracted by the GoRK:**
 - IBRD loan under the 1st programme to improve irrigation & drainage systems (PIID), 32 000 ha, 1996-2004
 - ADB loan to improve irrigation & drainage (ID) systems, 39 000 ha, 2000-2007
 - IBRD loan to build North Aral Sea dam, strengthen Shardara dam etc.
- **Key investment projects, to be funded from IFI loans attracted by KazVodKhoz:**
 - IDB and EBRD-1 loans: ID systems rehabilitation: > 242 000 ha (2017-2019)
 - Several more investment projects to be funded from IFI loans (ADB, IDB, EBRD, IBRD/WB) are under preparation: (pre-)feasibility studies
- **Key challenges: (i) to ensure cost-effectiveness of massive state support; and (ii) to make the sector attractive for investments**





Cost-effectiveness of State support is key



- Implementation of the whole State Water programme and achieving its targets requires significant support from the state budget (subsidies and guaranties). However, it would be a challenge in the present economic and fiscal situation...
Therefore:
- Before engaging in costly investment projects on building new water reservoirs, it make sense to find ways to increase economic returns from existing ones; and
- Taking into account budget constraints, it make sense to firstly significantly improve cost-effectiveness of state support to the water sector, and assess state support to other sectors impacting water resources and water infrastructure;
- Respective studies are included in the **OECD Country Programme for Kazakhstan:**
 - **Activity 1** aims at increasing contribution of multi-purpose water infrastructure (**MPWI**) to economy, water, food and energy security of Kazakhstan; while
 - **Activity 2** aims at improving the instruments and mechanisms of state support to water-intensive sectors so that to increase cost-effectiveness of state support measures and phase out, or reform, counter-productive ones

Innovative management tools

- Through these activities **two innovative management tools** have been developed or introduced. Specifically:
- A methodology for economic assessment of MPWI and various development scenarios, supported by a computer-base model called “WHAT-IF” (**W**ater-**H**ydro-energy-**A**griculture **T**ool for Investment and **F**inancing) was developed and pilot tested applying it to *Shardara* MPWI;
- A methodology for assessing instruments and mechanisms of state support to agriculture and other water-intensive sectors based on the PSE (producer support estimates) and methodology for assessing subsidies impacting the water sector, both developed by the OECD);
- Below, both innovative management tools are presented in more detail:



Tool for economic assessment of MPWI

- **Pilot project** (the work will be finalised by December 2016):
Shardara multi-purpose water infrastructure (MPWI) consisting of: reservoir, dam, HES; and related systems: *Kyzyl-Kum* canal and several others in South Kazakhstan and *Kyzyl-Orda* oblasts, *Koksaray* reservoir; water supply of *Shardara* city; flood protection, plus fishery and recreation
- **Objectives:** to increase contribution of the MPWI to economic development, water, food and energy security of respective country
- **Key outputs:** report on economic assessment of the MPWI, and an open source computer-based model in the public domain **to be used for economic assessment and investment planning (WHAT-IF Model)**
- **Sponsors:** Government of Kazakhstan, EU, Norway, Switzerland, OECD GAP TF
- **The innovative management tool could be applied to another MPWI in RK (e.g. *Kapchagai*) or in EECCA (e.g. might be of interest for *Toktogul + Upper Naryn cascade*) – subject to the availability of funds**





WHAT-IF Model to facilitate economic assessment of MPWI

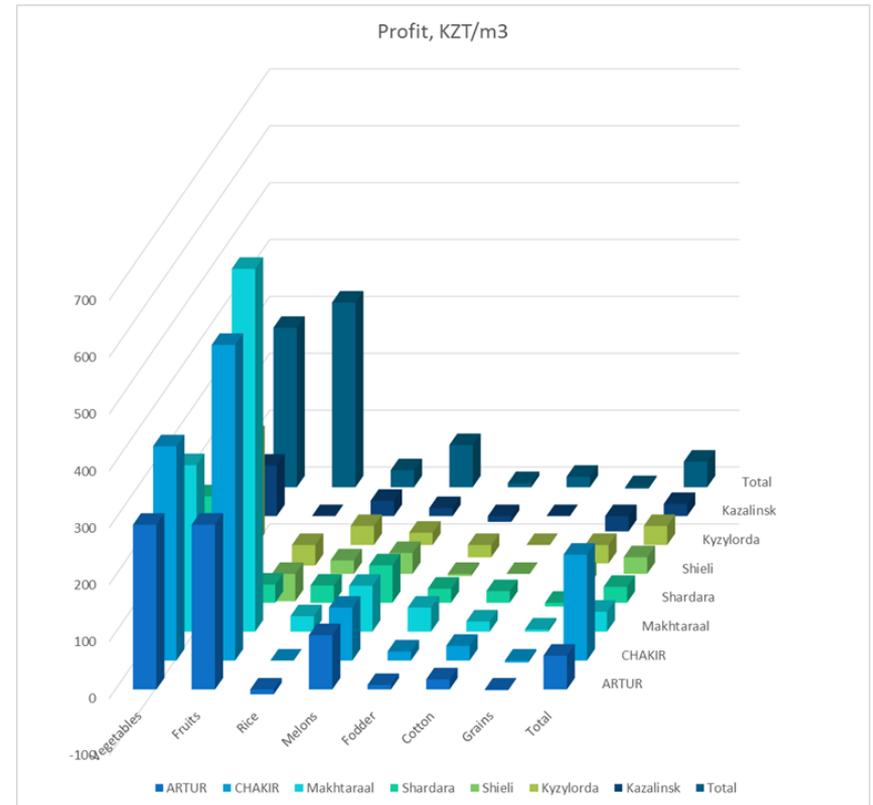
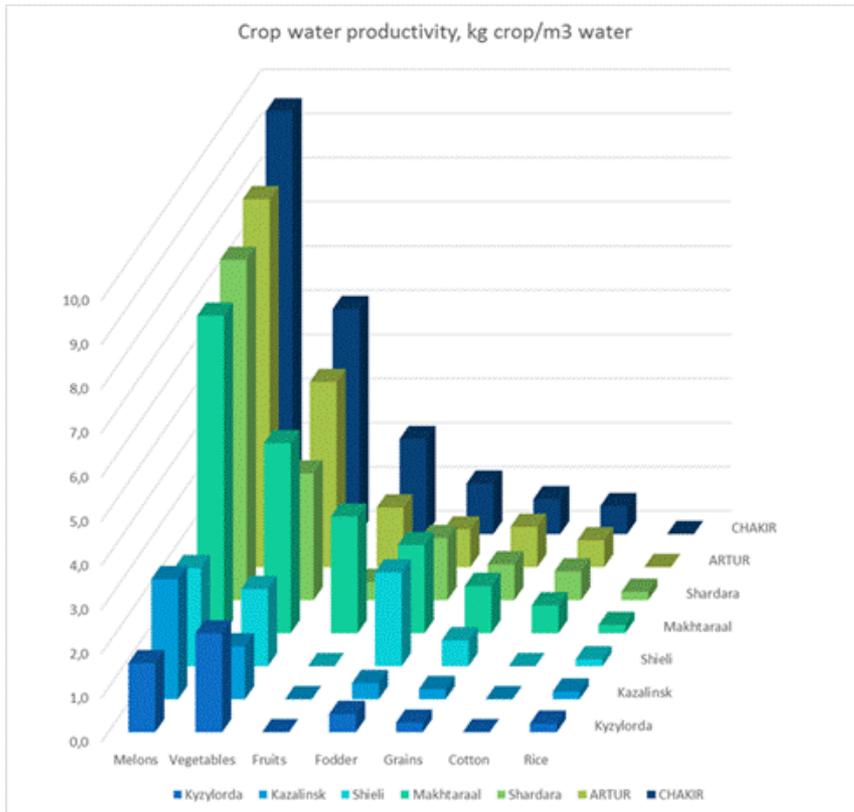


- **Distinct features:** ability to model selected single MPWI and investments in additional hydro-power and thermal plants; significant improvements compared to previous models (e.g. BEAM) regarding local crop demand function, soil salinity and return flows; ability to calculate distribution of benefits by sectors and areas (planning zones); WHAT-IF **may easily be replicated** in other basins (unlike CA centric BEAM)
- **Common features:** e.g. objective function; delineation into planning zones
- **Structure and functionalities:**
 - **Modules:** entry data; water mass balance; agriculture; energy; simulation of selected individual actions (e.g. investment in agriculture and irrigation (e.g. lining canal), energy, WSS or flood protection) and scenarios (set of actions) simulations; outputs charts.
 - **Model decision variables:** (i) **Land use and crop choices:** which crops to plant on which irrigated areas; (ii) **Reservoir management:** to balance the need for irrigation water with water for hydro-power; (iii) **Irrigation choices**
 - **Tables and output charts:** e.g. changes in water use and crop mixes; land and water productivity; impact on energy sector; overall consumer and producer surplus and fiscal impact



WHAT-IF Model – selected output charts

Water productivity, by crop and planning zone Profits, by water use (crop) and planning zone





WHAT-IF Model - Actions and Policy Questions in focus



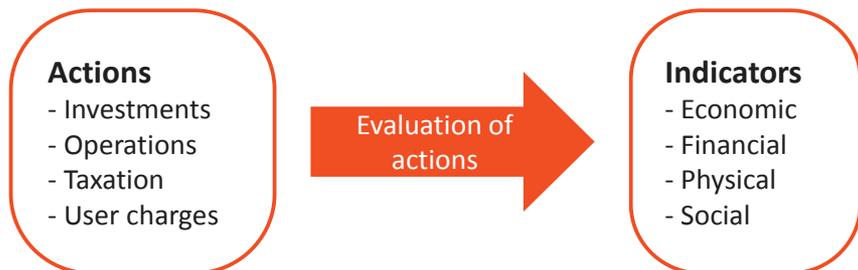
- **Actions are, as a rule, linked with governance and, especially, investments:** e.g. investments in improved conveyance systems to reduce water losses (e.g. lining a segment of Kyzyl-Kum canal); investments in improved on-farm irrigation systems; investments in thermal power generation *versus* investments in the reservoir and hydro power; management of reservoirs for alleviating flood and drought risks etc.;
- **Policy questions** are basically what-if questions
 - What if we introduce a land reform? Or change crop mix?
 - What if we renovate / improve the existing irrigation system?
 - What if we increase irrigation tariffs?
 - What if we construct a new irrigation system?
 - What if we develop collector-drainage system and re-use return waters?
 - What if we increase environmental flows (together with neighbouring countries)?
 - What if we increase hydro power production?
- The tool helps evaluate **actions** that address – and answer – **policy questions**
- **It will be used to support decisions on managing MPWI and plan investments**



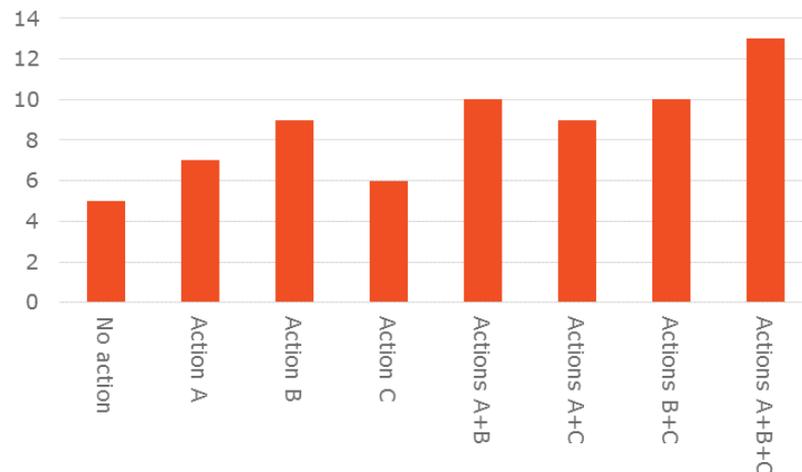
Scenario evaluation



- **Evaluation** of actions are based on certain indicators to be agreed upon by key stakeholders



- Evaluation makes use of **scenarios** (one or more actions) and **storylines** (one or more scenarios)
- These are **user-friendly** and facilitate the policy dialogue



- **Any action may be compared with business-as-usual or another action** with the purpose of highlighting impacts of an action or a series of actions





Improving instrument and mechanisms of State Support



- **Strategic objectives of the Republic of Kazakhstan** (improved water resources management, higher level of water and food security, improved well-being of population) **cannot be achieved without state support to respective sectors**
- **However, the present economic and fiscal situation calls for a drastic increase in cost-effectiveness of state support to specific sectors**
- The OECD study (based on recent review of agricultural policy in Kazakhstan, also by the OECD) estimated and assessed 10+ instruments of state support to agriculture, rural development and water (WSS)

Key preliminary findings and recommendations are as follows:

- Water resource can be managed in an efficient and sustainable way if and only if land resources are also managed in an efficient and sustainable way
- **This means that Agriculture and the Water sector should develop and grow together**, as established by the Government of Kazakhstan.
- **It requires good integration (or better coherence) of land (i.e. agriculture and food) and water policies**, as they are deeply interrelated.



Improving instrument and mechanisms of State Support



To improve state support instruments, the following is proposed:

- **Restructuring of production subsidies:** so that they would not only provide financial support to farmers, but also promote sustainable and efficient agricultural and water management practices (e.g. by linking subsidies to land and water productivity, to Good Agricultural Practices, etc.).
- **Concessional credit – provision of effective guarantees by the government,** to remove an important barrier to farmers' access to credit. Challenge: to identify a proper, effective mechanisms (current guarantees do not work) and create a facility for small and medium-size loans with low transaction costs
- **Increase tariffs for irrigation water** (tariffs differentiated by water uses, delivered gravity versus pumping) and expand metering of water consumption (which is currently lacking in several areas). This will make the irrigation sector more financially sustainable and provide an incentive for more efficient water use. If complemented by other, more cost-effective forms of state support to farmers (e.g. support to introduction of efficient irrigation techniques, to construction of storage & local food processing facilities and rural roads), the tariff increase would not have a negative impact on farmers' income and livelihoods.



The tools developed through the OECD Country programme for Kazakhstan will be used to improve water management and cost-effectiveness of state support to the water and agri-food sectors

THANK YOU! Коп рахмет! Благодарю!

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