EVALUATION REPORT

UNDA Project "Water Quality in Central Asia"

June 2012

CA	Central Asia
CAREC	Regional Environmental Centre for Central Asia
EEA	European Environment Agency
EECCA	Eastern Europe, Caucasus, Central Asia
EnvSec	Environment and Security Initiative. Supported by UNEP, UNDP, UNECE, OSCE, NATO
EU	European Union
IWRM	Integrated Water Resources Management
RWGWQ	Regional Working Group on Water Quality established by the Project
TA	Technical Assistance
UNECE	United Nations Economic Commission for Europe

Executive summary

This report is to provide evaluation of the UN Development Account project on "Water Quality in Central Asia" completed during Feb - June 2012 and implemented in cooperation between UNECE and CAREC.

The purpose was to review relevance, effectiveness and efficiency of the project and to include recommendations for possible further work on water quality cooperation in Central Asia (CA). The evaluation focuses on the key strategic issues to provide assistance to deal with next steps or in future choices.

This evaluation is mainly a desk-study assessment and it studies the project as demonstrated in written reports, presentation materials and workshop programmes, web pages and by checking up on the water quality database established and used during the Project. In addition, a couple of key persons were interviewed. Conclusions and recommendations address findings during the course of the evaluation. Important concluding remarks, which arose during interviews, were;

- In CA, due to shared water resources, there are urgent needs to harmonize methods and to develop similar angles of approaches to provide understandable and common ground for assessments and decision-making within the coherent and comparable framework of water quality monitoring, management and regulation,
- Obvious disproportionate progress faced between CA countries at the moment and especially in the future in terms of diverging capacities to run and outfit water laboratories, to carry out quality field work and to install or maintain automatic stations. This should be mitigated through targeted donor support or fair mutual cooperation, and
- Also the costs and human resources needed to fulfil the tasks required should be studied and figured out. It seems that resource estimations to run trans-boundary or nation-wide water quality monitoring and management received less attention during the Project, but is a crucial issue to define clearly, including costs in the future, if water quality management and monitoring will be neglected. The present day govt. budget allocations restrict strongly or have completely made impossible some activities necessary for water quality monitoring. This is the key reason why more concentrated and mutually integrated efforts are a prerequisite for the progress in the fields of trans-boundary water quality monitoring, data exchange and management.

For analysing the overall contents of the Project and its objective the Logical Framework Analysis was reviewed and how the Project met its objectives. It can be noted that preset tasks have been worked out in reality to the extent possible during the course of the Project and they are mutually in line with a coherent outcome. However, there is still a strong need to seek possibilities to make an extended use of Project's results and to catalyze strengthening water quality regulation, monitoring and assessments within target area.

Although from Central Asia we can find earlier attempts to address water quality management and monitoring capacity building TAs, this Project was the first of its kind in recognizing the need to carry out a thorough study of water quality standards and norms by each CA country. After that, acquired information was used in developing a well-defined comprehensive Cooperation Development Plan on water quality, including the assessment of the present situation, strategic directions for cooperation and guidelines for monitoring surface water quality. In practice, the Project provided some equipment for national laboratories to facilitate monitoring, organized a joint database for regional data sharing and prepared a joint pilot trans-boundary assessment to provide an example on how to progress.

Making an effort towards in harmonizing water quality monitoring and information exchange in practical terms by developing a basic water quality monitoring model including the defined set of parameters was a tangible step in terms of providing tools, which can be used further when the Project itself is over.

The fundamental problem in much of previous water quality monitoring is the lack of practical or clearly defined strategy, or lack of resources to define the strategy. What is to be avoided is to make "monitoring only for the sake of monitoring". To improve the situation the Project produced clear strategic statements addressing three relevant well-thought directions, which reflect a deeper understanding attained during the course of the Project.

Deliverables of this kind provide a firm ground for the further institutional initiatives to address water quality management. This means that the Project results will provide sustained added value for future projects and initiatives. However, the point is, how to keep up the results achieved, so that the work already done could back up or catalyze new initiatives to the extent possible, either national or multilateral.

A recommendation is that a continuously updated regional information base on water-quality-related legislation is beneficial to be kept up. This could be one of the tasks for the Regional Working Group on Water Quality, which has been set up by the Project and it is more than desirable that it could continue its work. All this purposed to support upcoming decision making within trans-boundary context.

In all, the Project was overall well set up and implemented for improving management and monitoring of water quality in Central Asia and it reached its objectives.

Contents

In brief; "Water Quality in Central Asia"

The goal of the project "Water Quality in Central Asia" was to enhance the development of an efficient and coordinated policy on improvement of water quality in the framework of integrated water resources management (IWRM) and the focus was placed on the management of water quality in rivers. Taking into account projected increases of populations and economic activities in Central Asian region, including anticipated adverse effects of climate change, the water quality management and monitoring are issues deserving more attention, and turning out to be crucial, if mismanaged.

Important reference documents of the Project were the UNECE Water Convention and its Protocol on Water and Health as well as the EU Water Framework Directive, which all are important international frameworks guiding the national as well as trans-boundary developments of water quality management.

The expected accomplishments of the Project were:
- A proposed step-by-step plan to develop coordinated national policies on water-quality aspects of integrated water resources management in Central Asia,
- Improved capacity among water experts and officials in the field of water-quality aspects of integrated water resources management, and
- Improved coordination of joint assessments, monitoring and information exchange with regard to water-quality.

Overall, the Project studied how different issues of water quality has been institutionalized, organized, data collected, assessed, reported and information delivered in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. All this purposed to support decision making within trans-boundary context.

The Project has initiated a regular framework for cooperation on water quality. As a conclusion, it proposes three well defined strategic directions of future work:

- Information exchange and harmonization of national policies with regard to water quality,

- Cooperation on water quality monitoring and data exchange, and
- The establishment of a regional expert body.

For getting background information, a thorough comparative study how water quality has been managed within EU, USA and in the former Soviet Union was carried out. This provided a broader context to discuss about water quality related issues and capacity building needs and possible directions of strategies.

Guidelines to carry out water quality monitoring were developed and described. The purpose was to harmonize ways to carry out monitoring with help of establishing a core set of water quality parameters deemed most useful within the context of CA. In practice, the Project provided some equipment for national laboratories to facilitate monitoring, organized a joint via internet shared database for regional data sharing and prepared a joint pilot trans-boundary assessment to provide an example of how to progress.

As well, making an effort towards in harmonizing water quality monitoring and information exchange in practical terms, the Project developed a basic model for monitoring water quality by defining a certain set of parameters to be monitored. This being a tangible step in terms of providing tools, which can be used further when the Project itself is over.

In all, we can state that the Project was set for improving management and monitoring of water quality in Central Asia and it reached its objectives. The Project was overall well set up and implemented. It was funded by the UN Development Account and implemented in cooperation between UNECE and CAREC in 2009-2012.

1. Purpose of evaluation

The purpose of this evaluation is to review the UNECE Project "Water Quality in Central Asia[1]". At the same time this takes into account deliverables from its precursor EU project "Harmonization and Approximation of Water Quality Standards and Norms in Central Asia", which, in practice, can be seen as the first stage of the Project. As well, the purpose of the evaluation is to provide recommendations for possible further work on water quality in Central Asia taking into account the outcomes of this project and putting them into a broader context with some other relevant water quality–related projects implemented earlier in the CA region.

2. Scope

The items evaluated were the objectives and problems addressed during the course of the Project, the outputs provided including project organization, activities, means and assumptions.

The region of Central Asia is far from stable in terms of administrative structures addressing water quality regulation and its monitoring. To provide assistance to deal with next steps or in future choices, this evaluation focuses on the key strategic questions/issues and work done or on items discussed during the course of the Project. Conclusions and recommendations having links to administrative dispersion, resource estimation, water quality objectives, classification of water

[1] The Project "Water Quality in Central Asia ", having the running time from March 2009 until June 2012, delivered a comprehensive Cooperation Plan on water quality. The representatives of the five Central Asian states (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) of the region endorsed it at a meeting in Almaty on 3 May. The Plan, "Development of the regional cooperation to ensure water quality in Central Asia" is the first of its kind for the region.

bodies, preliminary (pilot) surveys, instructions for network design, field work, laboratory work, quality assurance, data mgmt and reporting have been provided.

3. Methodology

This evaluation is mainly a desk-study assessment. It studies relevance, effectiveness and efficiency of the project as demonstrated in written reports, presentation materials and workshops' programmes[2], from the web pages of the Project and by checking up the water quality database prepared as a deliverable of the Project for the water quality data exchange in the region during the project and onwards, this for boosting cooperation tangibly. In addition, the project management team were interviewed as well as a couple of project participant[3] that were made in Kyrgyzstan in April 2012.

For analysing the overall contents of the Project and its objective and relevance and to provide assistance for purposes to carry through this evaluation, the LFA[4] (Annex 1) has been reviewed. The executive summary as well as the LFA review provided clarifications and summary of the Project and how its activities, outputs and assumptions are in relation with its objective and the problem addressed.

During the course of the evaluation, it turned out that the main source of information was CAREC[5] water quality web pages and the latest outcomes of the diagnostic report and cooperation development plan; "Development of Regional Cooperation in Ensuring Water Quality in Central Asia" with its two annexes "International Experience of Water Quality Management and Models Applicable in Central Asia", and "Guidelines for Developing a Transboundary Surface Water Quality Monitoring Programme for Central Asia". These reports were studied thoroughly and direct comments to their wordings are available, if needed, in addition to this report.

4. Criteria and brief comments on the Project's results

Relevance; Although from Central Asia we can find earlier attempts to address water quality (w.q.) management or w.q. monitoring capacity building TAs, this Project was the first of its kind in recognizing the need to carry out a thorough study of water quality standards and norms by each CA country and then using this information in developing a well-defined comprehensive Cooperation Plan on water quality for the CA region. These deliverables give a better ground for the further institutional "water quality" – related initiatives. This means that the Project results will provide sustained added value for future projects and initiatives. The point is, how to keep up the results achieved, so that the work already done could back up new initiatives to the extent possible, either national or multilateral.
As well, making an effort towards in harmonizing water quality monitoring and information exchange in practical terms by developing a basic water quality monitoring model including the defined set of parameters and compiling and running the shared database, were all tangible steps in terms of providing tools, which can be used further when the Project itself is over. Here, one criterion of relevance is a foreseen sustainability of the Project.

[2] The contractee and author of this report participated at the Fourth meeting of Regional Working Group on "Water Quality in Central Asia" in Bishkek, May 25-26, 2011. Discussions with participants and presentations given provided a clear picture about the project activities and good organizational skills of the team.
[3] Ms Taisia Neronova, Mr Turarbek Sadykbekov, Mr Talaibek Makeev, Ms Liudmila Nyshanbaeva
[4] The *Logical Framework Analysis* (*LFA*) is a management tool mainly used in the design, monitoring and evaluation of international development projects
[5] The Regional Environmental Center for Central Asia

With regard to the overall relevance of the Project, the recently agreed Astana Water Actions[6] express more or less directly the urgent needs and justifications to improve water quality management and monitoring within CA region.
It seems that from the very beginning of this Project the need to link both the purpose of monitoring and the management of water quality was emphasized. It is important to define the relationship of monitoring goals to management goals and find ways to carry out "Monitoring for management". The fundamental problem in much of previous water quality monitoring is the lack of practical or clearly defined strategy, or lack of resources to define the strategy. What is to be avoided is to make "monitoring only for the sake of monitoring". To improve the situation the Project produced clear strategic statements addressing three relevant well-thought out directions, which reflect a deeper understanding attained on ground during the course of the Project.

Effectiveness; We can take the LFA –analysis prepared as an indicative means to evaluate the effectiveness of the Project. It can be noted that preset tasks have been worked out in reality to the extent possible during the course of the Project and they are mutually in line with a coherent outcome. The Project is at its finalization stage meaning that some of the outcomes drafted will be improved to certain extent. However, although when the Project is finally over, there is still a need in the Region to improve national policies and regional cooperation, including water quality monitoring networks with the ultimate aim to improve water quality[7]. In any case, based on evaluation with the help of LFA, it can be concluded that the Project has met its objectives, but there is a strong need to seek possibilities to make an extended use of Project's results.

Efficiency; The UNECE Project "Water Quality in Central Asia" is implemented in cooperation with the Regional Environmental Centre for Central Asia. All participating countries had their national working group. An important component of the project was the establishment of a Regional Working Group on Water Quality (RWGWQ) with representation from all CA countries, which is expected to be a backbone for future water quality monitoring and management progress in the CA region. If the RWGQW will continue its work, it will provide one building block for Project's sustainability and will catalyze next steps of progress. Through national and regional working groups many professionals got capacity building when collecting, organizing and assessing country specific institutional information and then comparing results with each other. This kind of capacity building provides a basis, or even a springboard for further steps to improve regional water quality management and monitoring.

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[6] Seventh "Environment for Europe" Ministerial Conference in Astana, Kazakhstan 21-23 September 2011
An out-take from Astana Water Action addressing water monitoring and information management, assessment and research;
(a) Develop, establish and maintain joint systems for monitoring, assessment, forecast and early warning in transboundary basins;
(b) Harmonize existing reporting obligation and data formats;
(c) Ensure free and transparent exchange of information on water quantity and quality (surface and groundwater) in the transboundary context, which is easily accessible on the Internet;
(d) Provide online catalogues of existing regional and intersectoral water-related regulations;
(e) Identify and address hot spots in transboundary basins of lakes, rivers and groundwaters and perform risk assessment (loss of livelihoods, migration, environmental pollution/degradation, physical security and increase in conflict dynamics);
(f) Improve information and stakeholder participation in transboundary water basin management planning and its implementation, while supporting NGO participation in transboundary water bodies restoration and management measures.

[7] In the CA region, water quality is more likely to degrade than improve in near future and even keeping up the present status needs successful efforts and continuation for the projects like this.

Efficiency in terms of the activities of the Project; A major activity was to prepare, circulate and analyze the questionnaires of the national surveys. National experts prepared five National Reports on «Water Quality Standards and Norms» providing a remarkable resource base for understanding the present situation and providing a basis for planning and preparing for further progress. Especially the Uzbekistan report had complementary comments providing more useful information and explaining more profoundly the very nature of the items enquired in the survey questionnaire. The following points were highlighted;

- In preparing the structure of the National Report (NR), it was coordinated with the experts from Water Governance EC project and UNECE; the value-adding and productive cooperation was likely. A series of national and regional multi-actor stakeholder workshops and training activities were held on the results of the NRs and on EU management standards. These workshops set forth water quality standards and norms harmonization process with direct participation of stakeholders and fuelled multi-sector dialogue.
- From the way the national analyses were carried out, they can be considered reliable and they provide a good basis for further progress and will help further water quality initiatives and projects in Central Asia. The national reports are easily available from CAREC's web-site. The availability and quality of project outcomes and deliverables indicate good planning, solid project organization and management.

Later on, it could be beneficial, if these reports could be kept updated regularly in order to back up planning of progress.

5. Key findings

Face-to-face interviews were not many during the course of evaluation, but all of them gave nearly the same outcome and conclusion;
- In CA, due to shared water resources, there are urgent needs to harmonize methods and to develop similar angles of approaches to provide understandable and common ground for assessments and decision-making within the coherent and comparable framework of water quality monitoring, management and regulation. Major rivers are trans-boundary and mutually shared and broadly accepted good water quality management and monitoring practices would be a fundamental advantage.
- The interviewees highlighted that obvious disproportionate progress faced between CA countries at the moment and especially in the future in terms of diverging capacities to run and outfit water laboratories, to carry out quality field work and to install or maintain automatic stations. This should be mitigated through targeted donor support or fair mutual cooperation, because water quality in the Region is a common issue and sharing knowledge and resources could be a means to get maximum progress with regard to water protection.
- Also the costs and human resources needed to fulfil the tasks required should be studied and figured out. It seems that resource estimations to run trans-boundary or nation-wide water quality monitoring and management received less attention during the Project, but is a crucial issue to define clearly, including costs in in the future, if water quality management and monitoring will be neglected. The present day govt. budget allocations restrict strongly or has completely made impossible some activities necessary for water quality monitoring like for example in Kyrgyzstan, where very little monitoring is left compared during the Soviet period. This is the key reason why more concentrated and mutually integrated efforts are a prerequisite for the progress in the fields of trans-boundary water quality monitoring, data exchange and management.

Table: Comments to the Project's publications have been indicated by A to "Development of Regional Cooperation in Ensuring Water Quality in Central Asia", by B to "International Experience of Water Quality Management and Models Applicable in Central Asia" and by C to "Guidelines for Developing a Trans-boundary Surface Water Quality Monitoring Programme for Central Asia".

Publ.	Findings	Conclusions	Recommendations
A	**I. ASSESSMENT OF THE WATER QUALITY MANAGEMENT SYSTEM IN CENTRAL ASIA**		
A	1.**Water resources status and use profile in the countries of Central Asia**	ok	
A	The report provides by country bases a profound description on water resources in CA.	The definition of CA seems to be the five former Soviet CA republics, which are the target countries in this project.	Shared waters with the Islamic Republic of Iran have been mentioned. Perhaps it is worth of mentioning shared waters with Afghanistan as well, and projected consequences like indicated in e.g. EnvSec reports.
A	Country descriptions on water quality.	From Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan a good overall assessment provided on water quality including major concerns. Description on Turkmenistan water quality seems missing.	Water quality issues and underlying water protection practices can through discussions provide justified conclusions for common developments and be a rewarding platform to strengthen regional cooperation.
A	Reviews on long-term water quality monitoring data.	A full review for three major water quality trends provided. - steady increasing of pollutants 1970-90, then 15 years stabilization, and again increasing trend - degradation of water protection infrastructure - gradual increase of pollutants in trans-boundary rivers	Taking into account that the region has recently seen a vast degradation of its water quality monitoring systems, over CA might be several, but not recognized disadvantageous water quality and water ecosystem function trends, as well. This is the very reason to back up projects and initiatives upgrading water quality monitoring in CA.
A	**2. Description of the regulatory and legal framework**	ok	
A	**2.1 Review of national legislation**	ok	
A	The countries of Central Asia have similar systems of legislative regulation.	All these three statements have been well justified in the report.	Based on the results of this project, continuously updated regional database on water-quality-related legislation is beneficial to be kept up. This could be one of the tasks steered by the RWGWP.
A	Central Asian countries have completed development of their legal framework, including water quality management.	This provides ground for developing cooperation projects having common targets.	The RWGWP could provide advice so that possibly upcoming new water quality related projects can create additional value and provide useful steps forward in terms of sharing good practices.
A	National legislation in the region as a whole ensures water quality management.	Water quality management legislation as such is not a minimum factor, but the day-to-day enforcement functions lack power to certain degree due to many	This is to say that it is necessary to take care that not any of the countries find herself at disproportionately weak position in terms of collecting information,

		reasons.	which is the basis for negotiating and decision making.
A	**2.2. Review of national systems of water quality standardization**	Overall comment; In this chapter, the present situation in CA countries has been thoroughly studied, a long list of conclusions provided including helpful tables providing the possibility to compare countries between each other.	
A	The majority of water quality standards currently used in Central Asia is based on the System of Surface Water Quality Specifications, developed in the Soviet Union in the 1960-1970s.	To make progress within this field, water quality monitoring is needed, and the value of water quality database recognized to study relevant surface water specifications.	The CA is highly diverse in terms of availability of different kind of water qualities due to geographic conditions, pressures, status and responses, as well as with regard to the economic and social conditions that strongly influence, as well as the capacity of countries to implement management responses. Therefore countries should define their water quality specifications individually, but coherently with each other so that water quality specifications are close to possible management functions in each country.
A	Like indicated in the report; Substantial part of the requirements of the standards are not being implemented due to deficits in State budgets to finance relevant activities, as well as weak human and technical capacities.	Although the five CA states have the common historical Soviet background, we can recognize a process towards disproportionate situation in terms of powers to upgrade and to make progress within the framework of water quality monitoring and mgmt.	For maximising donor inputs the disproportionate progress should be monitored and, if only possible, to be mitigated. This is necessary for purposes to keep up mutual trust and equal opportunity to carry out productive cooperation
A	**2.3. Review of national water body classifications and water quality categories**	In this chapter, the present situation has been thoroughly studied indicating that the angle of approach is categories of water use, each having special requirements for acceptable water quality indicators.	Categories of water use are still a fundament, but the mission of Water Framework Directive indicating good ecological status should be included as an underlying factor apparently coming up gradually.
A	**2.4. Recommendations on the development of a regulatory and legal framework for water quality regulation**	ok	
A	**A. Consistent improvement of water and environmental legislation.**	The issues discussed cover water resource and water use and to some extent water protection.	Due to purposes for water quality regulation, a couple of issues addressing waste water discharges are worth of mentioning; Like regulations that govern permitting, self-monitoring, self-reporting and non-compliance responses. The purpose should be that waste water discharge permitting needs to be streamlined and used as a tool to achieve water quality targets that are well balanced with economic development objectives and interests of local communities .
A	**B. Development and adoption of**	A full set of different kind of	Although this might be too far

	unified classifications setting requirements for water quality for various categories of water use.	categories of water use has been mentioned. However, "general" usability has not been indicated.	reaching at this stage, but in terms of sustainable development and taking into account the extreme diverse physical geographic features met in Central Asia, different levels of carrying capacities of water bodies to bear pollution should be taken into account when formulating applicable common regional water quality classification scheme. This could be one of the easy steps within stepwise harmonization of water legislation under the framework of the IWRM-driven regional integration processes.
A	**C. Optimization of the list of monitored polluting substances**	Only limited or abridged list of indicators suggested, not any toxic substances indicated. For this purpose, low cost screening tests can be an alternative addressing possible toxic substances in water. These tests give outcomes indicating "yes" or "no" risk for toxics. If the outcome is frequently "yes" then more elaborate, specific and expensive chemical toxic analyses is justified.	At the moment in CA to monitor priority pollutants, or even part of it, like defined in EU, is very limited. It is a matter of regionally cooperating laboratories on the other hand and by country willingness to monitor priorities. In stead of chemically immediately analyse certain toxics, it is worth of considering to use low cost "screening tests" to recognize possible increased amounts of toxins in water. A screening test, in case positive results recognized, may indicate the need to proceed to definitive tests. So, the strategy could be following; if a low cost screening test indicates toxic pollution then the water quality authority can demand that expensive chemical analytical tests will be done on the cost of the polluter. This is to apply "the polluter pays principle" for water quality monitoring, or for emission control. The administrative instrument is self-monitoring, which has been promoted by OECD EAP Task Force for EECCA countries.
A	**D. Updating requirements for procedures, methods and facilities for water quality indicators measurement.**	Suggestions to further progress have been provided.	Focussing on trans-boundary waters, a resource estimate to carry out relevant water quality monitoring should be defined and gaps in terms of resources defined for further elaboration and donor cooperation. A standard annual cost for keeping up one water quality station and reporting its results should be defined and cost information upgraded annually to help to file in budget reservations
A	**3. Description of national systems of water quality management**	ok	

A	**3.1. Review of distribution of functions and powers in the sphere of water resources management**	A list of dispersion of powers, functions and dissimilarities has been reported. In all CA countries the functions of water resources mgmt are separated from environmental mgmt, including those related to water quality. IWRM calls for integration and to fulfill its purpose, there are needs for an integrator called Basin Water Council, or equivalent with powers, functions and coherent capacities to cover the scope.	Based on work done in the project, it might help to encourage and back up further donor cooperation if this CA "dispersion" information will be updated frequently. The "evolution" of environmental management is frequently water centered and the smoothest way to get progress is to put the dispersed water mgmt (quantity & quality) functions into coherent setting.
A	**3.2. Review of mechanisms of water quality management**	PPP principle has been highlighted.	The adoption of polluter pays principle needs seed money from government so that enterprise, or polluter self-monitoring can be adopted covering the major sources of pollution within the country. It should contain provisions of water quality monitoring within the area in where impacts of pollution of a certain polluter can be recognized, so that defining the impacted water area is one of the objectives of the self-monitoring undertaking.
A	**3.3 Description of water resources monitoring systems**	Degradation of water monitoring systems has been described.	Proper resource management requires data & assessments through institutionalized monitoring activities. The Project provided strategic directions and a functional body of RWGWQ. This work should be continued and strengthened on regional and country levels.
A	**3.4.Recommendations on development of mechanisms for water quality regulation**	This subject has been studied thoroughly in the chapters A, B, C, D, E and F and actually a full list of recommendations provided.	Priority analyses recommended in order to deal with among issues proportionately to their significance in the region and on country level. One of the major tools is National Policy Dialogues and they are the forums for water quality mgmt and monitoring issues as well . However, cost-benefit analyses should be done to indicate the importance of water quality issues and to seek them more weight on political agenda.
A	**A. Optimization**		
A	**B. Improvement**		
A	**C. Development**		
A	**D. Rehabilitate**		
A	**E. Development of information systems through**		
A	**F. Provide training and conduct awareness-rising through**		
A	**4. Regional cooperation in the sphere of water quality management**	As discussed, not all CA countries have adopted "Water Convention", but the Protocol on Water and Health can be adopted separately without "Water Convention". The principles said out in the Protocol of Water and Health provides objectives for organizing water quality management and monitoring.	
A	**4. 1 Review of practices**		
A	**Objectives**		
A	**4.2 Recommendations on the development of regional cooperation in the sphere of water quality regulation**	ok	Shared waters call for shared norms to manage water quality within the frame work, which knowledge different ecological

			zones faced in CA
A	**II. ACTION PLAN FOR REGIONAL COOPERATION TO ENSURE THE QUALITY OF (SURFACE) WATER RESOURCES IN CENTRAL ASIA**	ok	
A	**1. Strategic direction I: Information exchange and harmonisation of national policies with regard to water quality**	"Concervative" or "Dynamic" models recognized Defining the targets like; - ensure an overall improvement of water quality - be affordable, i.e. compatible with available resources - be flexible in order to adapt to changes in water use and water quality	Preventing further degradation of water quality could be emphasized as well. Dynamic model proposed for CA countries, which should be taken into account and supported as an ultimate aim through phased working strategy avoiding by-passing the weakest components
A	**2. Strategic direction II: Cooperation on water quality monitoring and data exchange**	ok	Strengthening the already compiled database and taking into account the water data directions provided by EEA.
A	**3. Strategic direction III: The establishment of the regional expert body**	ok	Exchange of experiences and transfer of good practices. Instead of looking for the most appropriate and effective solution alone, countries learn from others and should help one another improve regional water quality development in the most efficient way due the reasons that the target is shared waters.
A	**4. Building potential for regional cooperation**	ok	This provides good and well-thought ground for donor interventions, which might get stronger common focus thus getting additional impact
B	**Annex 1: International Experience of Water Quality Management and Models Applicable in central Asia**	It was a very relevant angle of approach to study former Soviet, EU and USA systems. Given that all these donors have a major external impact on Central Asia in near future the anticipated outcome is in any case connected to certain degree to all of these three.	At least in Kyrgyzstan, Japan Development Agency has been actively supported water monitoring through development work targeted to Issyk-Kul lake. If the project continues and lake water quality is within the scope, it is recommended to study and include Japan into background studies, if international experience will be further studied
C	**Annex II: Guidelines for Developing a Transboundary Surface Water Quality Monitoring Programme for Central Asia**	This will be worked out through discussing with help of critical elements of water quality monitoring like resource estimation, preliminary survey, objectives, monitoring network design, field work, laboratory work, quality assurance, data mgmt and reporting	
C	**1. Introduction and Problem Description**	ok	The main message should be that the purposes of monitoring should be strictly tied up to management activities; It helps if the strategy for monitoring and assessments is put

			simply to identify 1) pollution sources & structural changes in water environment, 2) pollutant dispersion & pathways and 3) recipients & targets, but not forgetting diffuse sources of pollution, which might be major one in certain areas when agriculture and animal husbandry is exercised.
C	**2. Step wise introduction of a Monitoring and Assessment Programme**	ok	
C	**2.1 Objectives of a Monitoring and Assessment Programme**	ok	
C	**2.2 Starting on a Basic Level and Widening Step by Step**	ok	
C	**2.3 Role of a Pilot Monitoring Programme**	ok	
C	**2.4 Further Requirements for Successful Implementation**	ok	
C	**3. What parameters should be measured?**	A basic set of parameter has been suggested all of which are included in the national monitoring programs in CA countries.	As to toxic substances; Screening tests for tracking toxics should be considered, These provide "yes" or "no" answers helping thus to navigate further.
C	**3.1 General considerations**	ok	
C	**3.2 Proposal for an Initial Monitoring Programme**	ok	
C	**3.3 Trace Substances, Biological Monitoring and Monitoring of Bacteria**	ok	see item 3.
C	**4. Sampling and Lab Analyses**	Need for samplers are indicated when the site of sampling is not well mixed or depth integrated samples have to be taken.	A part of sampling quality control is to check the cross-sectional homogeneity at a river sampling site as well, and the proper sampler is needed to do that. Water homogeneity is often a false assumption and deserves more attention to make sure that a sampling site is continuously homogenous
C	**4.4 Sampling Procedure, in situ Measurements and Storage of Samples**		
C	**4.5 Lab Facilities, Equipment for Sampling**		
C	**4.6 Sampling, Lab Analyses and Quality Management**		
C	**5. Sampling Frequency**	More often than once or twice per month sampling frequency has been suggested.	Sampling once per month should be enough, when monitoring is going to be long-lasting and multi-purpose without automatic stations like basic water quality monitoring program often is.
C	**6. Stations, Network Design**	Many good and important sampling station criteria have been provided.	Access to a sampling site is one of the major factors.
C	**7. Data Handling, Data Exchange and Evaluation methods**	ok	There is also a need to create a conceptual model for the whole water quality monitoring system encompassing all the data collection programmes involved and to use it as a strategic planning board to recognize most serious gaps
C	**7.1 Storage of Raw Data**	ok	
C	**7.2. Data Validation and Storage of**	ok	

	Validated Data		
C	**7.3. Data Exchange**	ok	
C	**7.4. Data Evaluation**	ok	
C	**References:**	There are more water quality related documents prepared by different UNECE working groups worth of mentioning.	UNECE/CEP/WGEMA (2007) Environmental Indicators and Indicators-based Assessment Reports UNECE/CEP/WGEMA (2011) "Guidelines for developing national strategies to use water quality monitoring as an environmental policy tool"

6. Major recommendations

1. Although the focus has been placed on rivers, there is a need for the future also to emphasise lakes (standing water bodies), because they are serving as a resource base for future economic development in terms of their water quality e.g. for tourism purposes or for fish-farming.
2. Water quality issues and underlying water protection practices can through discussions provide justified conclusions for common developments and be a rewarding platform to strengthen regional cooperation.
3. Taking into account that the CA region has recently seen a vast degradation of its water quality monitoring systems, there might be several, but not recognized disadvantageous water quality or water ecosystem function trends calling for improved tracking, monitoring and mitigation.
4. Although the five CA states have a common Soviet history, which had water use and mgmt as one of the priorities, we can recognize a divergin opportunities to upgrade and to make progress on water quality monitoring and mgmt.
5. Proper water quality resource management requires data & assessments through institutionalized monitoring activities. The Project provided strategic directions and a functional body in the Regional Working Group on Water Quality. This work should be continued and strengthened on regional and country levels.
6. The Project provides a full list of recommendations, how to improve water quality management, monitoring and assessments. However, a priority analyses to those recommendations might help in focussing on issues proportionately to their significance in the region and on country level. As well, suitable cost estimates, including expected benefits, to run e.g. water quality monitoring at a reasonable cost per sampling site could justify clearly the needs for govt. budget support and provide assistance to discuss with donors willing to back up comprehensive water quality monitoring, including capacity building of lab facilities.
7. Shared waters call for shared norms to manage water quality taking into account the different ecological zones in CA.
8. A basic set of parameter included in the national monitoring programs in CA countries has been suggested for common use on transboundary rivers. As to toxic substances; Screening tests for tracking toxics should be considered.

9. A suggestion is to undertake data harmonizing by initiating a Region wide Quality Assurance Programme (RQAP); Comparable monitoring data ought to be the basis when reviewing compliance of national requirements or international agreements. A suggestion is to undertake laboratory-inter calibration between those laboratories, which are producing water quality measurements for trans-boundary cooperation purposes tests with help of a qualified reference lab. As an alternative reference lab functions can be divided between countries so that a set of analyses belong to a certain lab, and another set to another, and so on.
10. To get sustainability for project achievements a continuously updated regional database on water-quality-related legislation is beneficial to be kept up. This is one of the tasks recommended in Astana Water Actions. This task suits for Regional Working Group on Water Quality.

Annexes

Annex 1: Logical Framework Analysis for the UNECE project "Water Quality in Central Asia"

Logical Framework Analyses (LFA) for the UNECE project "Water Quality in Central Asia"				
		Indicators	**Sources of verification**	**Assumptions and recommendations for the progress in future**
Overall objective	Enhancing the development of an efficient and coordinated policy on improvement of water quality within the framework of IWRM in Central Asia. The ultimate aim is to improve water quality.	Amount of water quality information provided for enforcement, reporting and decision making	National state of environment reports (SoE), statistical publications. UNECE/CEP reports including reports for EfE, Hydromet web - sites	Political commitment, administrative framework and institutional infrastructure will strengthen for the favor of water quality monitoring.
Project purpose	Designing, strengthening and kick-starting the implementation of Trans-boundary Surface Water Quality Monitoring Pilot-Programs between CA countries.	National water quality monitoring programs prepared including the extensions to trans-boundary monitoring as well.	Follow-up reports on running the water quality pilots and regular meetings of the Regional Working Group on Water Quality. Hydromet www-pages for dissemination WQ information	The very idea of UNECE Protocol on Water and Health will be gradually accepted. External support and technical cooperation projects will continue with CA countries for developing water quality mgmt policies and setting objectives for surface water qualities.
Result areas	EA1. A proposed step-by-step plan to develop coordinated national policies on water-quality aspects of integrated water resources management in Central Asia	WQ programs have enough common denominators (parameters, frequency) so that their assessments and findings can be used within the framework of IWRM – related decision making.	National Policy Dialogues; setting broadly accepted objectives addressing water quality	Monitoring for management (avoiding monitoring only for the sake of monitoring)
	EA2. Improved capacity among water experts and officials in the field of water-quality aspects of integrated water resources management	Mutually harmonized methods and procedures backing up water quality monitoring and assessment.	National IWRM reports.	National IWRM Policy Dialogues will continue having a stronger water quality extension included
	EA3. Improved coordination of joint assessments, monitoring and information exchange with regard to water quality	Number of upgraded procedures and broadly accepted standards in use (ISO, GOST) covering water laboratory, sampling and reporting. Number of joint transboundary WQ-monitoring programs.	Joint trans-boundary pilot WQ-monitoring exercises. Mutually accepted water lab proficiency tests and inter-calibrations. Using e.g. ISO 17025 as a base standard	CA water laboratories will adopt the latest ISO or GOST –standards on laboratory and water sampling. Regional working group on water quality continues its work.
	Activities	**Tasks fulfilled**	**Sources of verification**	**Assumptions and recommendations for the progress in future**
Result EA1	1.1 Preparing a diagnostic study including an overview of the existing legal framework in the five countries 1.2 Establishing the regional working group (RWGWQ) 1.3 Presenting a plan to ICSD and ICWC for approval	1) Drafting of a background study including an overview of the existing legal framework. 2) The Regional Working Group was established by requesting nominations from environmental, water and hydro-meteorological agencies 3) The plan will be presented to ICSD during its next meeting	1) Report prepared from every CA country (5pcs) 2) Regional Working Group has met 4 times. Final on May 3rd 2012. 3) Next meeting of ICWC	1) Database for the legal framework addressing surface water quality monitoring will be kept updated 2) Regional working group continues its work and its ToR will be frequently updated. 3) ICWC is going to have its meeting in summer 2012.
Result EA2	2.1 Developing training material on the basis of experiences of activities and adapting them for training purposes	1) The training material has been developed and propagated in the format of CDs and used in training workshops.	1) Report in printing and CDs for broad delivery	1) Training materials will be broadly acknowledged and put into the practice.

	2.2 Training a number of water experts and officials in the regional working group and workshops.	2) Topics of workshops: - (1) Permitting and WQ standards - (2) Monitoring and assessment of trans-boundary waters - (3) Setting of objectives and program of measures according to WFD	2) Workshop documents and presentations	2) Strengthening the capacities of the regional working group to continue its mission, if only possible, when the project is over, or having more capacities to define the next donor project addressing regional water quality mgmt to provide best possible impacts on progress based on results made during the course of this project.
Result EA3	3.1 Preparing Guidelines for water quality monitoring and exchange of information, presenting a joint assessments to ICSD and ICWC for approval	1) "Guidelines for Developing a Trans-boundary Surface Water Quality Monitoring Program for Central Asia" prepared	1) Report	1) Main authorities will back up the dissemination of project results and their gradual adoption .
	3.2 Establishing a joint database for water quality records	2) Database has been established	2) Database link provided a response and its contents description was in line with prepared Guidelines	2) Taking into account the crucial function of the database for rational mgmt and reporting of water quality in CA, there is need to have strong linkages to EEA's data & info mgmt functions as well.
	3.3 Preparing a joint pilot assessment of one transboundary river based on data made available according to the Guidelines	3) The assessment is presently being produced	3) Report	3) To get ongoing progress, adapting a suitable --- not too complicated --- river water quality assessment tool to help in interpreting and reporting the monitoring data and to check the validity of data and to interpret anomalies
	3.4 Implementing a WQ monitoring pilot and exchanging monitoring results between countries participating	4) WQ monitoring according to the Guidelines was made at 7 locations. Monitoring results were shared via a joint database accessible to all involved partners. During evaluation the database was tried and it worked properly, only more data should be filled in.	4) Results found in the DataBase	4) National (nation wide) Water Quality Monitoring Programs will be developed and trans-boundary monitoring is part of it.

Annex 2: Assignment

Ref.:
United Nations Office at Geneva
Contract No.: 35846, signed Feb 15th, 2012
Name of Contractee: Mr. Ari Mäkelä

Task: An external evaluation of the UN Development Account project "Water Quality in Central Asia" (hereafter called **the Project**)

The Assignment provided was the following:

The evaluation should review the following aspects of the Project implementation and results:

- Relevance: the extent to which the project is pertinent or significant for achieving the related objective and the extent to which the objective is significant to the problem addressed
- Effectiveness: the extent to which the project has attained its desired outcomes. This includes the extent to which the project has achieved its ultimate highest level outcome, its impact.
- Efficiency: a measure of how well inputs (funds, staff, time, etc.) are converted into outputs.

The evaluation should also include recommendations for possible further work on water quality cooperation in Central Asia.

An executive summary should briefly summarize the project, the methodology of the evaluation, key findings, conclusions and recommendations.

All material needed for the evaluation, will be provided to the consultant: project document and reports, meeting reports and publications, list of involved experts that can be interviewed by telephone.

This evaluated Project was implemented by UNECE and the Regional Environment Centre for Central Asia (CAREC).

Guidelines to carry out water quality monitoring were developed and described. The purpose was to harmonize ways to carry out monitoring with help of establishing a core set of water quality parameters deemed most useful within the context of CA. As well, in practice, the Project provided some equipment for national laboratories to facilitate monitoring, organized a joint database for regional data sharing and prepared a joint pilot trans-boundary assessment to provide an example of how to progress.

The Project has initiated a regular framework for cooperation on water quality. As a conclusion, it proposed three well defined strategic directions of future work:
- Information exchange and harmonization of national policies with regard to water quality,

- Cooperation on water quality monitoring and data exchange, and
- The establishment of a regional expert body.

Annex 3: In brief; Ari Mäkelä

Mr. Ari Mäkelä has 30 years of experience in the field of water resources management. He holds a MSc degree in limnology, microbiology and chemistry and works currently as a Senior Researcher at the River Basin Management Unit of Finnish Environment Institute's Freshwater Centre. Mr Makela has e.g. designed water body restoration studies to control harmful water weeds, inspected water laboratory functions and their data storages, designed water quality monitoring systems for aquatic environments in Finland and abroad, and taken part in several national and international quality assurance initiatives especially within the context of cooperation in International Standards Organization and between Nordic Countries. In addition Mr. Mäkelä's long-term assignments in three Technical Assistance Projects for Environmental Monitoring and Management Capacity Building in the Kyrgyz Republic (1998-2000, 2001-2002, 2004-2006) and shorter assignments in the KR (2010 and 2011) have included e.g. preparation of environmental monitoring and environmental permitting plans for the Ministry of Environmental Protection and its successors. The plans have included proposals for implementation of the plans. Mr. Mäkelä has prepared e.g. several water monitoring guidance articles and booklets published both in English and Russian.

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