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Working Group on Integrated Water Resources Management

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**Status and finalization of the second Assessment of transboundary
rivers, lakes and groundwaters in the UNECE¹ region:
Executive summary of the second Assessment**

Working Group on Monitoring and Assessment

Twelfth meeting

Geneva, 2–4 May 2011

Item 9 (c) of the provisional agenda

**Status and finalization of the second Assessment of transboundary
rivers, lakes and groundwaters in the UNECE region:
Executive summary of the second Assessment**

Finalization of the second Assessment of transboundary rivers, lakes and groundwaters in the United Nations Economic Commission for Europe region

Executive summary of the second Assessment

Note by the secretariat*

* The present document has been submitted late due to resource constraints in the secretariat.

¹ United Nations Economic Commission for Europe.

Summary

This document was prepared pursuant to decisions taken by the Meeting of the Parties to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes at its fifth session (Geneva, 10–12 November 2009), which entrusted the Working Group on Monitoring and Assessment, in cooperation with the Working Group on Integrated Water Resources Management, with finalizing the second Assessment of Transboundary Rivers, Lakes and Groundwaters in time for its submission to the Seventh “Environment for Europe” Ministerial Conference, to be held in Astana, from 21 to 23 September 2011 (ECE/MP.WAT/29, para. 81 (e)). The document presents a very preliminary draft of the executive summary of the second Assessment.

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I. Background and proposed action by the Working Group on Monitoring and Assessment and the Working Group on Integrated Water Resources Management

1. At their last joint meeting (7 July 2010), the Working Group on Monitoring and Assessment and the Working Group on Integrated Water Resources Management agreed that a separate executive summary with the main political messages of the second Assessment should be prepared for publication in time for the Seventh “Environment for Europe” Ministerial Conference, for enhancing dissemination of the main findings. The two working groups entrusted the secretariat to prepare for their next meeting a draft of the executive summary for discussion and review.
2. A draft of the outline of the executive summary was discussed at the extraordinary meeting of the Working Group on Monitoring and Assessment (Bratislava, 15-16 December 2010). The Bureau of the Meeting of the Parties at its fourteenth meeting also reviewed the outline and set up a drafting group to advise the secretariat on the structure and content of the executive summary.
3. The present draft of the executive summary has been prepared by the secretariat with the support of consultants on the basis of the inputs received. It builds on the agreed outline and includes very preliminary versions of some of the sections, to give an idea to the working groups of the tone and content of final product. The existing text will need to be further elaborated and revised.
4. As the second Assessment will have a subregional focus, also the executive summary should highlight the characteristics of the different sub-regions. The main messages highlighted are derived from the subregional summaries.
5. The maps, graphs and corresponding inventory of transboundary waters – both surface and groundwaters – are among the key contents of the second Assessment and should therefore feature prominently also in the Executive Summary. Furthermore, to reflect the different characteristics of each subregion, specific thematic maps and graphics are being prepared.
6. Due to the intended readership and use of the executive summary, it has to be a stand-alone synthesis of the subregional summaries (substantially rewritten, if necessary), drawing upon the whole content of the second Assessment, with visual appeal.
7. The Working Group on Monitoring and Assessment and the Working Group on Integrated Water Resources Management may wish:
 - (a) To review and comment the draft executive summary and provide guidance on strategic prioritization of issues and messages in it;
 - (b) To invite Parties and non-Parties to provide any additional comments and corrections to the executive summary **by 20 May 2011**;
 - (c) To entrust the secretariat and the Bureau of the Water Convention to finalize the Executive Summary on the basis of the information in the second Assessment and the comments received.

Annex

Extended outline of the executive summary

Foreword and Preface

I. Introduction

1. Background for the second Assessment, description of the process, scope and limitations, methodology (DPSIR framework) (2 pages).
2. This section will contain the overview maps representing all transboundary surface waters and groundwaters contained in the second Assessment as well as the Ramsar sites.

II. Overview of main issues for the whole UNECE region

3. This section will provide a regional overview of the main issues that emerged from the second Assessment, focusing on the following aspects.

A. Legal, policy and institutional frameworks for transboundary water management (3 pages)

4. Beside the descriptive text, this section will include 2 maps (1 for the European part and 1 for the Asian part of the UNECE region) illustrating the status of transboundary water cooperation (agreements, joint bodies, other water management cooperation arrangements).

B. Monitoring of transboundary rivers, lakes and groundwaters (2 pages)

C. Main problems, impact and status (6 pages including aspects linked to biodiversity and conservation deriving from assessment of the Ramsar sites)

D. Climate change and its impacts on water resources (2 pages)

5. Beside the descriptive text, this section will include 2 maps (1 for the European part and 1 for the Asian part of the UNECE region) illustrating the projected impacts of climate change and other climate related information.

E. Responses (3 pages)

F. The way forward (2 pages)

III. Transboundary waters in Central and Western Europe (4 pages)

6. This section will build on the major findings of the assessment for Western and Central Europe (document ECE/MP.WAT/WG.2/2011/8–ECE/MP.WAT/WG.1/2011/8). It will describe key issues, impacts and responses which are specific to the subregion as well as analysis and recommendations on the way forward.

7. A complex map will illustrate in a graphical way the main pressures in the subregion. A graphic will illustrate status and trends of responses. Moreover a map with the location of the rivers and major basins covered in the subregion will be included.

IV. Transboundary waters in Eastern and Northern Europe (4 pages)

8. This section will build on the major findings of the assessment for Eastern and Northern Europe (document ECE/MP.WAT/WG.2/2011/6–ECE/MP.WAT/WG.1/2011/6). It will describe key issues, impacts and responses which are specific to the subregion as well as analysis and recommendations on the way forward.

9. A complex map will illustrate in a graphical way the main pressures in the subregion. A graphic/Table will illustrate status and trends of responses. Moreover a map with the location of the rivers and major basins covered in the subregion will be included.

V. Transboundary waters in South-Eastern Europe (4 pages)²

A. Key issues and impacts

10. The countries of the South-Eastern European subregion share between them 13 major transboundary rivers, four large lakes and some 50 transboundary aquifers. Given that transboundary basins cover about 90 per cent of the region, effective transboundary cooperation is a crucial driver for regional progress on water management issues.

11. However, transboundary cooperation, including information exchange between riparian countries and joint monitoring remains weak, or at best uneven. Low political prioritization of the issue, financial constraints, and insufficient institutional capacity and, in some cases, conflicting interests between countries are some of the major factors behind a lack of progress in this area.

12. The turbulent recent history of the region, which experienced armed conflicts throughout the 1990s, has resulted in the emergence of new countries and new national jurisdictions relating to water. As a result, building and maintaining effective cooperation in the subregion has, and continues to be, a challenge.

13. A number of joint agreements on water resource management do exist between some countries in the subregion, but poor implementation, largely due to a lack of political will and institutional capacity, has hindered substantial results so far.

14. Furthermore, rapid and, at times, uneven, economic and industrial development in many countries, combined with the challenges of poverty and post-conflict recovery has also meant that water management is generally a low priority area for governments in the subregion.

15. Steady growth in the region's manufacturing, mining and hydropower sectors has emerged as a particular environmental challenge, with the unsustainable management of industrial wastewater continuing to undermine environmental protection efforts in the region.

16. The uncontrolled, and often illegal, disposal of industrial wastewater from factories and other manufacturing facilities is just one potentially damaging side-effect of this rapid period of economic development and is an issue of growing concern for the region.

17. Levels of government investment and financial resources allocated to wastewater treatment and collection systems vary from country to country (for instance, the areas to the north of the Danube generally have better resources and are more efficient than those in the

² Also in this section, a complex map will illustrate in a graphical way the main pressures in the subregion. A graphic/table will illustrate status and trends of responses. Moreover a map with the location of the rivers and major basins covered in the subregion will be included.

south, see map) meaning the risk of water pollution and related health hazards remains considerable.

18. An example of this problem is the picturesque Prespa Lakes which are shared by Greece, Albania, and the former Yugoslav Republic of Macedonia. These lakes are at risk of pollution from the uncontrolled disposal of industrial and household waste by local communities. In response, the National Strategy for Waste Management in the former Yugoslav Republic of Macedonia is now providing for a regional landfill that will cover the needs of the Prespa and also the Lake Ohrid areas; it will be constructed outside the boundaries of the respective sub-basins.

19. Untreated industrial and domestic wastewater is also impacting on the status of the Struma/Stymónas River in Bulgaria and Greece. In Bulgaria, organic matter from wastewater discharges and a lack of wastewater treatment plants continue to be a particular cause of concern. The planned construction of wastewater treatment plants for settlements with more than 2000 inhabitants, scheduled for completion in 2014 will address this issue.

20. Past and ongoing mining activities in many countries also contribute to the release of polluting substances into shared water resources. Most importantly, mine-related accidents, typically resulting from heavy rains and landslides, pose significant environmental risks.

21. Aside from the mining and manufacturing sector, agricultural production still remains an important source of income and employment in South-Eastern Europe. Current methods of irrigation and farming across the subregion are placing increasing pressure on water resources

22. For example, in some parts of the Tundzha/Tundja River, shared by Bulgaria and Turkey, and in the basin of Maritsa/Evros/Meriç River, shared by Turkey, Bulgaria and Greece, extensive agricultural activity had led to 80% water consumption from this sector alone. Similarly in the Aegean Sea basin where crop production is significant, low efficiency in agricultural water use and the loss of water through degraded drinking-water supply networks also account for a considerable part of local water wastage.

23. The chemical pollution of water resources, as a result of agricultural and irrigation activities, is also undermining the quality of several water bodies across the subregion.

24. The Nestos/Mesta River, shared by Bulgaria and Greece, - in particular its delta - and the River Neretva, which flows through Bosnia and Herzegovina and Croatia, are just two examples of water bodies with high contamination rates of pesticides and organic pollutants stemming from local farming activities. In Slovenia, nitrogen and pesticides pollution due to agriculture and livestock breeding is also an important issue in terms of surface and particularly groundwater quality.

25. In the case of the Maritsa/Evros/Meriç River, 74 per cent of diffuse pollution comes from agriculture, with nitrate pollution of groundwater reported in the Bulgarian sector of the river. The Nišava/Nishava River, shared by Bulgaria and Serbia, is also affected by diffuse pollution from agricultural activities as is the Aaos/Vjosa Basin, shared by Albania and Greece, where main pressures result from agricultural activities, animal production and aquaculture.

26. On a more positive note, Austria has reported that the impact of agricultural activities on groundwater quality in the Mura River Basin, shared by Austria, Hungary, Slovenia and Croatia, is steadily lessening.

27. Alongside problems stemming from industrial and agricultural pressures, an increase in the burgeoning regional tourism sector has also placed additional — albeit highly seasonal — stress on water resources by increased water use, and generated higher levels of sewage and water pollution.

28. Lake Ohrid, shared by the former Yugoslav Republic of Macedonia and Albania is just one example of this trend: the lake, the deepest in the Balkans and the Macedonian part of which is a designated UNESCO World Heritage Site, is attracting a steady flow of both holidaymakers and urban development (holiday houses and some hotels) around the lake. Illegal construction to accommodate the growing number of tourists has become a recognised problem in the Drin river basin.

29. Hydroelectric power is a key source of energy in South-Eastern Europe, particularly in countries such as Albania, where hydropower contributes to over 90 per cent of the country's energy production, and Bosnia and Herzegovina where hydroelectric power is now a major export commodity, as well as in some basins such as the Maritsa/Evros/Meriç.

30. The extensive use of water resources for hydropower production is now a very common trend in several South-Eastern European countries, but the inefficient management of dams has resulted in flooding in some cases.

31. Dams are also a major cause of the hydromorphological alteration of rivers, interruption flow and habitat continuity.

32. Finally, the issue of climate change is an important aspect of discussions about water resources in the region. South-Eastern Europe is predicted to become increasingly affected in numerous ways by climate change; the region is currently one of the most at risk from water-scarcity in Europe. In addition, the Intergovernmental Panel on Climate Change (IPCC) has predicted decreased amounts of summer rainfall for the region and an increase in the frequency and severity of droughts and other extreme weather events. This Assessment has revealed that whilst data and information on climate change for the region does exist, it has not been incorporated in national policies on transboundary water cooperation.

B. Responses

33. Transboundary cooperation between countries sharing river and lake basins and aquifers remain weak, or at best uneven. In most transboundary basins, information exchange is still underdeveloped. Joint monitoring and assessment programmes are virtually non-existent

34. A number of positive examples of transboundary cooperation should be highlighted. Cooperation agreements for the Ohrid, Sava, Skadar and Prespa Lakes have been established, with the Sava cooperation proving the most advanced so far. Joint bodies also exist but have different level of effectiveness, and bilateral cooperation arrangements vary.

35. With regard to cooperation on transboundary groundwaters, a low level of knowledge and understanding about this type of water resource is only adding to the difficulties of transboundary cooperation. Regionally, there seems to be less information available about aquifers (compared to surface waters), in terms of quantity and especially in terms of quality. This is particularly true for karst systems widespread in the Balkans (their extent and limits, drainage patterns, flow paths and vulnerability are still not sufficiently understood due to the complexity of these systems).

36. Progress in law-making has been considerable in the subregion generally over recent years, but there is still an uneven level of advancement in the implementation and enforcement of relevant legislation across the region. Institutional and legal frameworks in the SEE countries have been revised or are in an on-going revision process.

37. The transposition of EU legislation into national law has been a powerful driver for the improvement of national legal frameworks and should be encouraged. Both the Stabilization and Association Process and the EU Accession Process have played an important role in calling for the integration of policies and supporting priority water

management-related investments across the subregion. But, as the process of approximation to the standards of the EU in recent years has attracted most of the limited financial and human resources available in the countries, it has, in some instances, had adverse effects on transboundary cooperation.

38. River Basin Management Plans, pursuant to the EU Water Framework Directive, have now been completed in EU Member countries. A basin-level approach has also been partially adopted by most non-EU Member States, but the implementation and enforcement of this approach still remains a challenge.

Table of responses

| Response | Progress | Status |
|-----------------|-----------------|---------------|
| Legislation | Fast up | Medium |
| Cooperation | Slow up | Medium |
| Basin approach | Slow up | Medium |
| Monitoring | Slow up | Low |

C. The way forward

39. There is a great potential for sharing the benefits of transboundary waters in South-Eastern Europe. However, the current level of cooperation is not suited to support such development, to ensure long-term sustainability or to prevent possible negative transboundary impacts in most of the basins.

40. Compromise and consensus-building are critical components of joint-decision making and countries with shared water interests should therefore expand on opportunities for communication and cooperation. Enhanced cooperation in the areas of water resource monitoring and assessment with a harmonized approach will be an important step forward. Fostering a common understanding of water issues, and their root causes, will create a good basis upon which to build trust and to develop commonly-agreed objectives and solutions.

41. Regional cooperation is currently facilitated by various initiatives, supported by donor countries, and the European Union and the United Nations agencies can also play an important role in facilitating coordination in South-Eastern Europe (e.g. the Petersburg Phase II/Athens Declaration Process which is jointly coordinated by Germany, Greece and the World Bank and technically facilitated by The Global Water Partnership) Whilst coordination by international actors is a welcome initiative, care should also be taken to ensure there is no duplication in work or objectives.

42. Actions to secure country ownership are of paramount importance. While international actors help initiate cooperation, empower institutions and establish coordination mechanisms, the responsibility falls to the riparian countries to secure the continuation of efforts and the sustainability of outcomes.

43. Bearing in mind the special conditions in South-Eastern Europe, the UNECE Water Convention has a special role to play, as it offers a common platform for EU and non-EU countries. It is a useful tool for assisting the implementation of EU water legislation by non-EU countries. Countries that have not done so yet should consider accession to the Water Convention.

44. Development plans at the national level should balance the need for development with the need for the sustainable use of natural resources and environmental protection. Governments should take into account both upstream and downstream considerations factoring in, for example, the possible negative impacts on the surrounding ecosystem and

evolving climatic conditions when planning new dam infrastructure and making other development plans.

VI. Transboundary waters in the Caucasus (4 pages)³

A. Key issues and impacts

45. A number of unresolved political conflicts and the enduring legacy of the post-Soviet era continue to influence the institutional and legal setting of the Caucasus and impact on the management of and cooperation over transboundary waters resources. The level of transboundary cooperation between States is still low, and a prevailing sense of uncertainty and mistrust – if not the total absence of diplomatic relations - is often proving a hindrance to the establishment of effective formal agreements on transboundary waters management.

46. A number of bilateral agreements on water resource monitoring have however been established (please see the Responses section below for details). But in general, the implementation of bilateral agreements in the region is weak, particularly in relation to water management-related clauses, and a lack of political will is proving detrimental to sustainable progress on effective water management and cooperation.

47. For example, since the signing of the agreement on environmental cooperation between Georgia and Azerbaijan in May 1997, no official working group or intergovernmental body has been established to oversee or support implementation of the agreement in either country. The absence of stable, long-term cooperation in the Kura River basin, the main transboundary river in the Caucasus, shared by Armenia, Georgia, Azerbaijan, Iran and Turkey, is the main challenge for transboundary cooperation in the subregion.

48. The natural availability of water in the Caucasus is quite variable, with abundant resources in the mountainous areas of Georgia and Armenia and scarcity in Azerbaijan. Growing economic development and an increase in populations could lead to an increase in both consumptive and non-consumptive water use and thus to growing scarcity.

49. The agricultural sector constitutes the largest consumer of water in the Caucasus also due to substantial water losses, (as much as 30 per cent), through inefficient and poorly maintained irrigation systems. More than 60 per cent of the water withdrawn from the Kura in Azerbaijan is used for agriculture.

50. In Georgia, a large proportion of current irrigation infrastructure consists of open, unlined channels, meaning the level of water efficiency is low and potential for water scarcity is increased. Georgia predicts that its withdrawal of water from the Kura will increase by approximately 20 per cent by 2015 compared to 2008, with withdrawal from the Alazani sub-basin increasing by 10 per cent and from the Iori by 3 per cent.

51. The unregulated over-abstraction of groundwater resources for irrigation is also a problem as well as the salinization of soils, especially in more arid areas of the Caucasus and where drainage is not well organized.

52. With the increased prioritization of economic development, there has been a marked increase in agricultural production and irrigation in some parts of the subregion. For

³ Also in this section, a complex map will illustrate in a graphical way the main pressures in the subregion. A graphic/table will illustrate status and trends of responses. Moreover a map with the location of the rivers and major basins covered in the subregion will be included.

example, in some parts of Azerbaijan in the Kura basin, agriculture and animal husbandry are now the main drivers of the economy, and irrigation systems are consequently being further developed, putting substantial pressures on the local water resources. In contrast however, the number of irrigation systems in operation in Georgia and Armenia is on the decrease.

53. Water pollution generated by the agricultural use of pesticides, nitrogen, phosphorous, and other substances is a significant challenge. Pollution from the return flow from cultivated lands and livestock farms is, for example, impacting on the water quality of the Alazani River Basin, a sub basin of the Kura, on the Akhuryan/Arpacay basin shared by Armenia and Turkey and on the Araks/Aras River which flows through Iran, Armenia, Turkey and Azerbaijan. Efforts to minimize the impact of agricultural activities on water resources are increasingly taking hold in a number of countries in the region. For instance in the Turkish part of the Aras/Araks Basin pollution from agriculture is tackled through introduction of efficient drainage systems for irrigated land, as well as limiting and controlling use of pesticides and fertilizers in agriculture.

54. Investment in wastewater treatment infrastructure is commonly lacking. Even though many urban areas are connected to sewage treatment networks, few wastewater treatment plants have been set up. In rural settlements, the amount of wastewater collection facilities is often insufficient. Pollution from both controlled and uncontrolled dumpsites is also a problem.

55. The efficient management of industrial wastewater continues to be a challenge for many countries in the Caucasus. Although the significance of mining as a pressure factor has substantially decreased in the last 20 years, the mining of commodities such as copper does still generate heavy metal pollution due to acid mine drainage from tailing dams. The Debed and Voghji River basins in Armenia, where industrial pollution levels have reached a worrying level, are just two examples of this problem. Wastewater from the ore enrichment and processing industry is also an important pressure factor in some sub-basins like the Debed.

56. As highlighted earlier, the prioritization given to economic development, business and industry in the Caucasus has often been at the expense of the environment. The increase of the hydropower sector has given particular rise to concerns about changes to the natural river flows and other detrimental impacts on river dynamics and morphology and sediment transport.

57. Water-related infrastructure and development projects are seen as the key for socio-economic development and the construction of weirs, dams, hydropower plants and related structures for electricity generation is continuing apace, notably in Georgia, Iran and Turkey where the hydropower industry has been significantly developed in the Chorokhi/Coruh basin. The Muratli and Borcka dams have been in operation since 2005 and 2007 respectively and further 10 hydropower projects along the main river are also planned.

58. Finally climate change is predicted to have a high impact on the region, particularly in terms of water scarcity and the drying up of rivers. Increased summer temperatures have also been predicted and the variability of flows and the risk of extreme weather events are predicted to increase. Natural disasters like landslides and mudflows are perceived as common problems in certain areas of the Caucasus. Some studies on the impact of climate change have been carried out for the Caucasus, but actual adaptation measures are mostly only starting to be considered. Turkey, for example, developed a “National Climate Change Strategy” in 2009 but the actual implementation of these measures still lies ahead. Iran has also been developing a national plan for tackling climate change. But in general, little has so far been done to downscale potential climate change impacts on the region.

B. Responses

59. Progress in reviewing and reforming existing environmental legislation continues to be gradual across the region. Recent examples of advancement include the adoption of a series of environmental laws in Turkey, more effective enforcement of environmental regulation in Georgia (with a reduction in violations), and new environmental legislation in Iran which is expected to reduce impacts on water resources. A move towards more progressive water legislation is also clearly illustrated by Armenia’s water code of 2002, which refers to, amongst others, the development of water basin management plans and intersectoral water advisory body.

60. Georgia is currently in the process of preparing to accede to two major transboundary conventions, namely the Convention on the Transboundary Effects of Industrial Accidents (TEIA) and the Water Convention.

61. Despite these encouraging signs of progress in legislation, proper enforcement and institutional reforms, necessary to make a difference, are still lacking. There has however been progressive approximation towards the European Union’s (EU’s) Water Framework Directive (WFD)⁴ and other international frameworks including the Water Convention and the Framework Convention for the Protection of the Marine Environment of the Caspian Sea.

62. IWRM plans are not yet developed or applied in the region, and are yet often understood differently in its different parts, but some positive steps are being taken in that direction. For example, Turkey plans to initiate the preparation of a River Basin Management Plan on the Chorokhi/Coruh River and Iran also reports that a comprehensive IWRM plan for the Araks/Aras Basin is under preparation. Georgia has also announced the development of a river basin management plan for the Georgian part of the Chorokhi basin, scheduled for the period from 2011–2013. EU funds several river management projects in the Kura basin too, working on both the interstate and the sub-basin levels.

63. A number of bilateral agreements on water resource monitoring have been established, notably between Georgia and Turkey, Azerbaijan and Iran, Armenia and Iran, Armenia and Turkey (on the Araks/Aras and Arpacay/Akhuryan Rivers) and Turkey and Iran (on the Sarisu River.) A bilateral agreement on cooperation for the joint monitoring and assessment of the Kura River was also signed between Georgia and Azerbaijan in 1997. International assistance is also moving regional cooperation in the field of joint monitoring and assessment in the right direction. Such efforts will hopefully address problems of data comparability between countries which arise from — for example — a lack of consistency in methods, and link to more general challenges from sampling to analytics.

64. Investments in wastewater treatment still remain limited, but some progress has been made. The programme to rehabilitate the Tbilisi and Rustavi wastewater collection and treatment infrastructure in Georgia is one positive example.

Table of responses

| Response | Progress | Status |
|--------------------|-----------------|---------------|
| Legislation | Slow up | Medium |
| Cooperation | Unchanged | Low |

⁴ An important driver is the EU Neighbourhood Policy, under which Armenia, Azerbaijan and Georgia signed agreements committing themselves to bringing new environmental laws closer to EU legislation

| | | |
|-----------------------|---------|--------|
| Basin approach | Slow up | Medium |
| Monitoring | Slow up | Medium |

C. The way forward

65. Greater political commitment to transboundary cooperation is needed to improve the institutional framework and the management of transboundary water resources in the Caucasus. Existing technical cooperation initiatives, established through various projects, gradually strengthen relationships and the experience of cooperation, but a long-term, sustainable framework for transboundary collaboration is yet to evolve⁵. Also the capacities of national institutions in the field of water management remain insufficient, and will need further improvement and support to meet the challenges faced by the region.

66. Economic development is clearly a priority for countries in the region, but efforts should be made to ensure that water and environmental protection are not neglected if the region wants to guarantee to itself a long-term and sustainable growth. As highlighted earlier, economic development and population increases are likely to increase water use, both consumptive and non-consumptive, contribute to the problem of water scarcity in the region and threaten the quality of water and water-related ecosystems.

67. This risk of water scarcity, experienced downstream and seasonally/periodically elsewhere, can be countered by an overall improvement in regional water management and irrigation efficiency. Water saving measures, as well as the conjunctive use of water, including the treatment and re-use of drainage and return waters should also become matters of priority for governments in the region.

68. In terms of agricultural pollution, tighter regulation and control of the use of pesticides, fertilizers and other farming pollutants will not only reduce the harmful effects on water quality in rivers, but also improve the reuse potential of the return waters.

69. More comprehensive and collaborative research into the effects of climate change is still needed at the regional level. Initiatives to develop a common understanding of the major challenges and to collate existing knowledge should be developed and moves to establish joint or coordinated adaptation strategies should be accelerated.

70. Donors currently providing financial support to water management, monitoring and protection programmes in the region should ensure that their interventions respond to the priority needs of Caucasian countries. The impact and progress of all funded activities should be monitored at the national level and recipient countries should take responsibility for following up on projects in the long-term.

VII. Transboundary waters in Central Asia (4 pages)⁶

A. Key issues and impacts

71. Since the break-up of the Soviet Union, Central Asia has experienced great political, economic and social change. Over the course of the past 20 years of post-Soviet transition, the infrastructure, political and legal systems of the independent Central Asian countries have evolved in various ways and progressed at different speeds.

⁵ Today, the most important Kura river still lacks a basin cooperation agreement.

⁶ Also in this section, a complex map will illustrate in a graphical way the main pressures in the subregion. A graphic/table will illustrate status and trends of responses. Moreover a map with the location of the rivers and major basins covered in the subregion will be included.

72. Levels of socio-economic development and the availability of infrastructure and resources vary from country to country. The uneven political and economic development and distribution of resources (especially of fossil fuel reserves and hydropower capacity) in Central Asia has created a complex and challenging context for regional cooperation on water resource.

73. The majority of the region's surface waters resources are of transboundary nature. Many originate in the mountains of the upstream countries of Kyrgyzstan, Tajikistan, and Afghanistan, and eventually feed into Central Asia's two major rivers, the Syr Darya and the Amu Darya, which are part of the Aral Sea Basin and flow through the downstream countries of Kazakhstan, Turkmenistan and Uzbekistan. Yet the region does not yet have an overarching legal framework to serve as the "rules of the game" on arrangements for the management and protection of shared water bodies (please see the Response section for further details).

74. The legacy of industrial pollution and environmental neglect of Soviet-era initiated projects is well recognized and continues to have an impact in Central Asian countries. The mismanagement of waste or industrial by-products, such as uranium tailings, and the unregulated use and dumping of pesticides and other hazardous chemicals are just some examples of Soviet-era practices which continue to contribute to water pollution across the region.

75. The historical legacy of environmental degradation is now being compounded by the modern-day prioritization of national economic development. The interests of big business and the needs of large-scale agricultural and water users still tend to override environmental concerns and the prioritization of environmental issues is generally low across Central Asia.

76. Population growth in the Central Asia region has been rapid in the past 20 years and has consequently added additional pressure on water resources. The population in the Aral Sea basin has, for example, more than doubled from 1960 to 2008 to almost 60 million. Southwest Uzbekistan, the Fergana valley, southern Tajikistan, and northern Afghanistan are particularly densely populated zones in the region.

77. Central Asian economies are still highly dependent on agriculture and the farming sector remains an important source of income and employment. The agricultural sector constitutes the largest (consumptive) water user in the transboundary basins in Central Asia. The reduction of water flows due to excessive irrigation has contributed to land degradation and desertification, while the absence of efficient drainage systems has increased soil and water salinity. Once the fourth biggest inland lake of the world, the Aral Sea has drastically shrunk after decades of intense water diversion for irrigation. The scarcity of water in the Aral Sea Basin, resulting mainly from the extensive irrigation and non-effective management and use of water adds to conflict potential, putting water at the heart of regional security and stability.

78. The water resources of Lake Balkhash, Central Asia's second-largest lake located in Kazakhstan, and its tributary rivers are used for irrigation, municipal and industrial water supply. Increased water use for crop cultivation from the lake and the Ili River, which flows from China into Lake Balkhash, has contributed to an increase in the salinity of water in the lake and reduced inflow.

79. Alongside agriculture, hydropower is also an important and growing sector in the mountainous Central Asian countries. In Kyrgyzstan and Tajikistan, hydropower generates more than 90 per cent of the domestic use of electricity. Hydropower is an important electricity source but it has also given rise to various environmental and security risks. Peak demand for hydropower in the mountainous countries comes in the winter season, when water is released from reservoirs. However, given that the demand for water in downstream countries with large-scale irrigation peaks in the summer, diverging interests will continue

to create tensions if a balance between the use of water for irrigation and the use of water for energy is not satisfactorily agreed upon.

80. The maintenance and repair of ageing hydraulic infrastructure, (such as dams and irrigation systems) is being carried out in various countries, but more efforts are needed to improve water efficiency and safety across the region. Construction of a number of new dams, mainly for hydropower but also to collect irrigation water, was initiated in the late 2000s. Concern about the safety of more than 100 large dams and other water control facilities, located mostly on transboundary rivers, have grown in recent years. Ageing dams and their inadequate maintenance, coupled with population growth and development in flood plains downstream from the dams, have resulted in increased risks. The inadequate and uncoordinated management of dams and reservoirs can pose a serious risk of flooding, as illustrated by the failure of the Kyzyl-Agash Dam, in Kazakhstan in March 2010.

81. Finally, the negative impact of climate change is of mounting concern for the region. Despite the limited amount of data made available thus far, a significant number of predictions have been made concerning the potential impact of climate-change on water resources in the region. An increase in air temperature and a short-term increase in river flows, due to the melting of glaciers, is one such prediction. In the long-term, river flows are predicted to decrease and levels of aridity and evapotranspiration are predicted to rise which could increase irrigation requirements for water and heighten the risk of regional droughts.

B. Responses

82. A legal framework for regional cooperation over Central Asia's shared waters was put into place in early 1990s, immediately after the breakup of the Soviet Union, but it has become increasingly recognized that this legal framework is now largely outdated and requires a radical improvement.

83. The recognition by the Heads of Central Asian governments in April 2009 of the need to improve institutional and legal frameworks for regional water cooperation under the umbrella of the International Foundation for Saving the Aral Sea (IFAS) was a promising step forward in strengthening the legal frameworks and building the institutional capacity of regional organizations. Yet its actual and effective implementation remains a challenge for the future.

84. Over the past decade, a number of countries in the region have worked to reform their national water legislation, and some have established bilateral cooperation agreements on shared water resources and applied the principles of integrated water resources management. The Chu-Talas Commission between Kazakhstan and the Kyrgyz Republic demonstrate how basin cooperation may work in practice.

85. On the multilateral level, Turkmenistan is in the process of acceding to the UNECE Water Convention, and Kazakhstan and Uzbekistan are two countries advocating for countries with which they share waters to accede to the Convention. However, there remains a marked lack of consistency on the part of governments when it comes to understanding and applying international laws on the sharing of transboundary water resources.

86. The current prioritization of economic development has meant that water and other environmental concerns are often overlooked or insufficiently addressed at the government level. There are however a number of notable exceptions to this general trend, for example in Kazakhstan where the Concept of Development of Water Sector and the Programme on Drinking Water have encouraged an ecosystem friendly approach to water management in the country.

87. Yet despite some developments in water legislation and policy reform, implementation remains generally limited or even lacking. The application of IWRM is weak with the exception of Kazakhstan, even though all countries are trying to move in that direction. This general lack of practical action is explained by the absence of strong or universally accepted national and regional institutions dealing with water resources.

88. International organizations can play a role in facilitating transboundary cooperation in Central Asia - the current collaboration between the Asian Development Bank and the Chu-Talas Commission being one such example. Whilst international assistance is to be welcomed, interventions must be well coordinated to avoid duplication and a State dependency on external funding must be discouraged. The continuation of operations after the end of projects is also a factor which requires careful consideration.

89. With the break-up of the Soviet Union, the monitoring of regional water resources has significantly deteriorated. Over the past 20 years, the quality and reliability of hydrometeorological data has declined and locating up-to-date information on the region's water resources is a challenge. With the exception of Kazakhstan, where investment in monitoring and assessment has increased in recent years, the capacity of national authorities to effectively monitor the quality and quantity of their water bodies (as well as making regional seasonal water forecasts and long-term predictions of water availability under climate change scenarios) is currently low. The monitoring of water quality today is almost non-existent. Challenges also exist in hydrological data collection, flood forecasts, monitoring droughts and sharing information⁷. A lack of effective, sustainable groundwater monitoring programmes in most countries in the region still remains an obstacle to evaluation of groundwater quality and quantity in the transboundary aquifers. Limited resources for such work either make it difficult, or create unwanted competition among sparse institutions. Donor funds from projects are used to support monitoring, but the challenge is how to sustain progress for the long-term.

Table of responses

| Response | Progress | Status |
|-----------------------|-----------------|---------------|
| Legislation | Fast up | Low |
| Cooperation | Unchanged | Low |
| Basin approach | Fast up | Low |
| Monitoring | Slow up | Low |

C. The way forward

90. Limited transboundary cooperation on water management and protection, and the lack of an overarching legal framework for the region continue to undermine progress. Basin management institutions therefore need to be enhanced and transboundary cooperation based on international legal instruments be strengthened. The entry into force of Articles 25 and 26 of the Water Convention is particularly important for Central Asia as it will allow accession to countries outside the UNECE region (Afghanistan, Iran, China

⁷ The Scientific Information Centre of the Inter-State Commission for Water Coordination was set up to facilitate and improve levels of regional monitoring, but it has been difficult to come up with a system/platform that the countries have confidence in and are willing to contribute to. Among recent efforts to improve the availability and exchange of information in the water and environmental sectors has been the CAREWIB project

and Mongolia) and contribute to the creation of a common legal basis for bilateral and multilateral agreements.

91. The development of transboundary cooperation will need reformed institutions, the crucial one being IFAS. Central Asian states and the donor community need to undertake serious joint efforts to increase its capacities, sustainability and effectiveness. By enhancing transboundary water cooperation and establishing open water dialogues, Central Asian countries can also pave the way for future cooperation in other fields like transport, trade, transit and energy, moving towards building consensus and away from the politisation and polarisation of the already difficult issues.

92. It should be noted that Afghanistan is presently not represented in regional water management institutions. Given that Afghanistan shares a number of water bodies with the Central Asian republics and that its domestic demand for water is increasing, the involvement of Afghanistan in regional cooperation needs to be addressed.

93. The cases of the Aral Sea and Lake Balkhash are two important examples which highlight the need to improve water efficiency, develop more effective irrigation systems in the region, switch to less water demanding crops, and limit irrigated land area. Increasing reservoir storage to compensate for the loss of glaciers, encouraging desalinization and the use of brackish groundwaters are just some of ways in which improvements could be made. Above all, policies which encourage the cultivation of less water-demanding and more drought-resistant crops in agriculture⁸ and greater investment in the repair and maintenance of irrigation systems are also constructive measures which merit important consideration.

94. The countries of the Central Asian region need to develop effective water and ecosystem management systems within the limits of their national resources and the historical legacy of environmental degradation. Improving water use efficiency, monitoring and introducing water saving technology is necessary to ease the pressure and relieve water scarcity for the future.

95. More effective land management policies, such as limiting deforestation and encouraging a shift away from unsustainable agricultural and grazing practices, would also assist in limiting erosion problems and sustaining mountain watersheds.

96. Joint environmental impact assessments of planned transboundary projects should be carried out in a more systematic manner. This is particularly relevant for planned hydropower projects in Kyrgyzstan and/or Tajikistan, e.g. the Shurob, Sangtuda 2 and Rogun dams on the Vakhsh, Kambarata 1 on the Naryn. Developing small-scale hydropower projects, which do not disrupt water flows and are less damaging to the environment, could be considered as an option of energy provision.

97. Monitoring needs to be significantly strengthened, especially that of water quality. Studies of groundwater, which plays a potentially important role in sustaining ecosystems and limiting land degradation, should also be intensified to improve levels of knowledge about water management challenges.

98. Improved regional cooperation on climate change and variability studies would be beneficial for all countries. Not all the countries in the region give priority to climate change related concerns and more needs to be done to ensure the impact of climate change is taken into account when national plans for water use and management are being formulated. Better monitoring of the status of glaciers and snow reserves in the mountains

⁸ Admittedly there has been some change in crop cultivation in past decades, notably increasing cereals at the expense of cotton.

— degradation of which has been reported by several countries — will provide indications about how water availability will develop.

Annex I Inventory of transboundary rivers, lakes, groundwaters and assessed Ramsar sites by recipient sea, including basic information (e.g. basin area, riparian countries, etc.) (5 pages)

Annex II Status of ratification of selected international agreements relevant to transboundary water management (2 pages)
