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Legal Framework

International and EU legislation on monitoring of surface waters and transboundary use of aquatic resources and cooperation on adaptation to climate change and comparative legislation analysis of the Romania, Republic of Moldova and Ukraine

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Recently we can see a renewed and growing interest in hydropower in transboundary rivers, but there are many environmental, social and economic risks attached to hydropower development and more over, existing interstate cooperative arrangements are often weak. The international and regional practice proved, that efficient river basins agreements are heavily reliant on ‘out of basin’ principles for water sharing. The potential (disastrous) economic, social, cultural, environmental and bio-diversity impact of all these hydropower projects are considerable. The building of dams for hydropower provision when not done properly, or when downstream flow requirements are not considered, can have an enormous adverse effect on water resources and livelihoods, especially in the poorest nations. The main dimension of water is the quality that is a major objective in transboundary water management, in this case the monitoring activity has a determinant role , representing the basic tool in water policy development, ensuring the related management. In the absence of effective governance of dams, hydropower has been and will continue to fuel the potential for water to become a source of serious conflict between countries.

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Introduction

Access to safe water and sanitation was a priority issue in the UN's Millennium Development Goals and the 2002 World Summit on Sustainable Development. Reports for the Second International Conference on Water and Climate (France, October 2017) and water scarcity already affects almost every continent and more than 40 percent of the people on our planet. By 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity, and two-thirds of the world's population could be living under water stressed conditions of all biomes, freshwater ecosystems are the most threatened, and 1/5 of freshwater fish species are in rapid decline.

The world's 276 international watercourses contain key freshwater supplies and sustain rich ecosystems in 148 countries. They cover almost half the earth's surface, are home to around 40% of the world's population, and generate about 60% of global freshwater flow. Cooperative management frameworks exist for only about 40% of the world's international watercourses.¹

Many agreements have significant gaps or failings. Among such problems: treaties fail to consider long-term changes in water availability and the need to revisit water allocations accordingly; lack of seek to promote the integrated management of the watercourse, the decisions are weak without due regard for the interests and needs of other co-watercourse states, from information sharing, to joint basin management and development.

Cooperation on transboundary rivers brings benefits that neither country could achieve alone - it allows river basins to be treated as integral systems, which is the main goal of integrated water resources management.

Such treaties are less likely to aid parties in responding to the effects of climate change on water resources in a cooperative and sustainable manner.

Periodical revisions may prove necessary for sustaining the resource, protecting ecosystems, and meeting human needs, while maintaining a fair balance between all the states concerned.

Chapter 1 starts with an overview of the international provisions, providing explanations of the legal and procedural aspects on innovative transboundary monitoring of the transformations of the river ecosystems under the impact of hydropower development and climate change. The chapter 1 includes an introduction outlining the key challenges in managing transboundary waters and current status of international law in this field.

Chapter 2 provides an overview of the EU policy and legislative framework in which hydropower is expected to operate in Europe, accordingly to key provisions with preventing of the a further deterioration of rivers but also to actively restoring their ecological status and removing, or at least significantly reducing, the pressures and threats they face due to the hydropower activities. The Water Framework Directive, Flood Directive and the EIA, SEA Directives are briefly summarized as is their relationship with the Habitats and Birds Directives.

In **Chapter 3**, recommendations from the international regarding the monitoring of the effects of hydropower on freshwater ecosystems. A focus is given on Water Framework Directive and Habitats Directive, also relevant aspects on assessing the impact were compiled from the Regulations on the status of surface water and

¹ See, Flavia Loures Dr. Alistair Rieu-Clarke Marie-Laure Vercambre Lesha Witmer, 05

that of monitoring and systematic evidence of the state of surface and underground water. An example on impact scaling of hydropower impact is presented from Czech Republic, also an overview is made on those changes and indicators of impact, which are important for monitoring the hydropower impact in the context of climate change.

Particular attention is given in **Chapter 4** on the analysis of the Romanian, Ukrainian and Moldovan legislation, which aim to find a synergy between policies and practices on energy, nature and water in order to take account of the river's ecological requirements early on in the planning process and wherever possible also include measures to improve the ecological status of the river, illustrating this with good practice examples of ecological restoration from across the EU.

List of acronyms and abbreviations

ILC - International Law Commission

RBMPs - River Basin Management Plans

RM-Republic of Moldova

IWRM - Integrated water resources management

WFD - Water Framework Directive

EIA - Environmental impact assessment

EU - European Union

EQR - Ecological Quality Ratio

SEA - Strategic environmental assessment

UN - United Nations

UNECE - United Nations Economic Commission for Europe

UN Watercourses Convention - Convention on the Law of the Non-navigational Uses of International Watercourses

UNECE Water Convention - Convention on the Protection and Use of Transboundary Watercourses and International Lakes

CBD - Convention on Biological Diversity

GHG emissions - Greenhouse Gas Emissions

GD - Government Decision

ICPDR - International Commission for the Protection of the Danube River

Chapter 1 International water law

1.1 International Conventions on water management and transboundary water cooperation

The role of global guidelines, rules and general principles, legal norms that govern inter-State relations in various areas, as: use and protection of international water-courses and environmental protection; equitable utilization of international watercourses by reasonable management, in particular, taking into account, their cross-border nature in the case of activities which cause or are likely to cause transboundary impact; catalyzing regional integration and sustainable development around the world is critical in this regard.

After World War 1, international law started to regulate activities other than navigation. The *UN Convention on the Law of the Non-navigational Uses of International Watercourses*, covers all uses other than navigation was adopted on May 1997. This Convention is not ratified by the Moldova, Ukraine and Romania, but it based on state practice and on agreements concerning individual river basins or regional watercourses, becoming a customary law which according to the art.38(1) of the Statute of international Court of Justice shall apply in international disputes. As a guiding instrument for treaties at the regional and basin levels, providing comprehensive codifications of general, universal norms, such as that states are to use an international watercourse in a way that is “equitable and reasonable” in relation to other states sharing the watercourse (Article 5) and take all “appropriate measures” to prevent causing “significant harm” to co-riparian states (Article 7).²

One of the most significant innovations in the international watercourses law development has been the *Draft Articles on the Law of Transboundary Aquifers* in 2008 elaborated by the ILC. The Draft Articles on the Law of Transboundary Aquifers is not intended to become a treaty, the UN General Assembly recommend to states concerned to make appropriate bilateral or regional arrangements for the proper management of their transboundary aquifers on the basis of the principles enunciated in the articles³.

Both instruments codify universal norms and principles such as the principles of equitable utilization and the no-harm rule, and contain obligations on riparian states to co-operate through different means: setting up joint mechanisms and inter-State commissions, regularly exchanging information and data, and notifying other riparian states about planned measures.

According to the art.8-9 and 11-19 of the UN Watercourses Convention, art.8 of the Draft Articles on the Law of Transboundary Aquifers the obligation to exchange information cover information concerning the conditions of the watercourse, particularly information of a hydrological, meteorological, hydrogeological or ecological nature, and establishes the exchange information mechanisms for dealing with planned measures and deals with the obligations of notifications and consultation.

² UN Watercourses Convention, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-12&chapter=27&clang=en

³ The Law of Transboundary Aquifers, UN General Assembly Resolution 63/124, available at http://www.un.org/en/ga/sixth/71/transboundary_aquifers.shtml

Article 21 of the UN Watercourses Convention set forth the obligations to prevent, reduce and control the pollution of an international watercourse that may cause significant harm to other watercourse States or to their environment, including harm to human health or safety.

Being a framework Convention should be used in state practice and agreements concerning individual river basins as a basis for the utilization, development, conservation management and protection of international watercourses and the promotion of the optimal and sustainable utilization thereof for present and future generations’.

This sustainable approach in relation to the equitable use principle to economic and environmental concerns was emphasized by the Court in 2010, in the *Pulp Mills* case, that:

*.....the Court considers that the attainment of optimum and rational utilization requires a balance between the Parties’ rights and needs to use the river for economic and commercial activities on the one hand, and the obligation to protect it from any damage to the environment that may be caused by such activities, on the other.*⁴

Thus, the first step during the process of cooperation between states in using of transboundary watercourse in an equitable and reasonable manner is it, do not to cause significant harm.

This obligation derives from the right to sovereign exploit the own resources, which stipulated in the Principle 21, 1972 Stockholm Convention. According to this fundamental international principle is not allowed to use the watercourses by one state in such a way, as caused damage to the environment from own territory to other states.

1.2 International conventions on cooperation in the obligation of prevention, control and reduction of transboundary impact

The principle of “equitable and reasonable” requires a case-by-case assessment, mutual exchange of data and information on a basin, as well as consultations and cooperation with the obligation of prevention, control and reduction of transboundary impact. In this context the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) 1997 (status in force: Romania 2001, Moldova 1997 and Ukraine 1999) and the Protocol on Strategic Environmental Assessment (2010) (status in force: Romania 2010, Moldova 2018 and Ukraine 2015) Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (1998) (status in force: Romania 2000, Moldova 1999 and Ukraine 1999) Convention on the Transboundary Effects of Industrial Accidents 1992 (status in force: Romania 2003, Moldova 1994 and Ukraine hasn’t ratified) have strengthening transboundary water cooperation.

Primarily the *Convention on Environmental Impact Assessment in a Transboundary Context) (Espoo Convention) 1997* (status in force: Romania 2001, Moldova 1994 and Ukraine 1999) was adopted in Espoo, Finland, on 25 February 1991 and entered into force on 10 September 1997. In 2001, the Parties adopted an amendment to the Convention allowing non-UNECE member States to become Parties (into force on 26 August 2014).⁵

⁴ Attila Tanzi. New York 2015.,p.15

⁵ Espoo Convention, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4&chapter=27&clang=_en

The Espoo Convention is intended to help make development sustainable by promoting international cooperation in assessing the likely impact of a proposed activity on the environment. It applies to activities that could damage the environment in other countries. Ultimately, the Espoo Convention is aimed at preventing, mitigating and monitoring such environmental damage.

The Espoo Convention ensures that explicit consideration is given to environmental factors well before the final decision is taken on activities with potential environmental impacts. It also ensures that the people living in areas likely to be affected by an adverse impact are informed of the proposed activity. It provides an opportunity for these people to make comments or raise objections to the proposed activity and to participate in relevant environmental impact assessment procedures. It also ensures that the comments and objections made are transmitted to the competent authority and are taken into account in the final decision. A **Protocol on Strategic Environmental Assessment** to the Espoo Convention was adopted on 21 May 2003 and entered into force on 11 July 2010 (status in force: Romania 2004, Moldova 2018 and Ukraine 2015). It applies the principles of the Espoo Convention to plans, programmes, policies and legislation, but with a focus on the national impact assessment procedures.

EIA and SEA are both forms of environmental assessment. They are procedural instruments of preventive environmental policy and as such both have similar goals and a lot of similar features, in particular as far as the procedural elements are concerned. EIA and SEA differ however significantly with regard to the type of the activities covered by the assessment and the scope of the assessment.

EIA under the Espoo Convention is applied to specific activities i.e. concrete individual projects that are planned to be undertaken by developers (regardless of whether they are private or public) and require authorization by a competent public authority. Thus, EIA is undertaken for activities planned by developers regardless of whether they are individual persons, private companies or public bodies responsible for developing infrastructure projects.

SEA under Protocol on SEA is applied to strategic documents, such as plans or programs, prepared by public authorities, which, unlike developers under the EIA scheme, do not need to seek a decision from any other authorities to authorize their strategic documents. The SEA scheme under the Protocol on SEA does not cover strategic documents prepared by private persons or companies.

At the monitoring stage, under the art.10 of the Protocol, each Party monitors the significant impact: on health, environmental effects in implementation of plans and programs, in order to identify, in special, at the beginning stage, potential negative effects, with aim to take necessary remedial actions. The results of the monitoring carried out shall be made available to the public authorities as well as to the public in accordance with national legislation.⁶ The **UNECE Convention on the Transboundary Effects of Industrial Accidents 1992** helps protect human beings and the environment against such accidents by preventing them as far as possible, by reducing their frequency and severity and by mitigating their effects. Issues related to the prevention of accidental water pollution are addressed in close cooperation with the 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (status in force: Romania 2003, Moldova 1995 and Ukraine, hasn't ratified).

Parties are required to establish programmes for monitoring the conditions of transboundary waters (Water Convention, art. 4). Parties are obliged to take

⁶ Protocol on SEA, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4-b&chapter=27&clang=_en

appropriate measures for the prevention of industrial accidents and other sources with transboundary effects, including measures to induce action by operators to reduce the risk of accidental pollution (Industrial Accidents Convention, art. 6, para.1).

According to the art. 6, para.2 of the Industrial Accidents Convention, in any hazardous activity, the Party of origin must require the operator to demonstrate the safe performance of the hazardous activity by the provision of information such as basic details of the process, including analysis and evaluation.⁷

Contingency planning is complex and involves the coordination of many actors at the national level and in a transboundary context. One tool commonly used in this process, to verify that standards (e.g., of industrial safety) are being adhered to, is the application of a checklist that allows competent authorities to check the applied safety standards and procedures against national legislation and international good practices. The operator has the responsibility for emergency preparedness and response inside the jurisdiction of the hazardous facility. The competent authority has to ensure that external and internal emergency plans are compatible, also in a transboundary context, and that mutual assistance is requested or provided respectively.

The ***Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (1998)*** (Aarhus Convention) embraces governmental accountability, transparency and responsiveness. It sets minimum standards - a floor, not a ceiling - for citizens' rights in the field of environmental decision-making. The Aarhus Convention was adopted at the Fourth "Environment for Europe" Ministerial Conference in Aarhus, Denmark, on 25 June 1998. It entered into force on 30 October 2001 (status in force: Romania 2000, Moldova 1999 and Ukraine 2001) As at April 2014, it had 47 Parties from the United Nations Economic Commission for Europe (ECE) region, which includes 46 countries plus the European Union (EU).

The Aarhus Convention links environmental rights and human rights, acknowledges that we owe an obligation to future generations and establishes that sustainable development can be achieved only through the involvement of all stakeholders. It links government accountability and environmental protection in imposing clear obligations on Parties and public authorities towards the public as far as access to information, public participation and access to justice are concerned. It focuses on interactions between the public and public authorities in a democratic context and is forging a new process for public participation in the negotiation and implementation of international agreements.

According p.13. of Annex I of the Convention, the public must be involved in the decision-making process related to the construction and operation of dams and other installations designed for the holding back or permanent storage of water, where a new or additional amount of water held back or stored exceeds 10 million cubic metres.⁸

The Aarhus Convention grants the public rights and imposes on Parties and public authorities obligations regarding access to information and public participation in watercourse management.

⁷ UNECE Convention on the Transboundary Effects of Industrial Accidents, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-6&chapter=27&clang=_en

⁸ Aarhus Convention, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-13&chapter=27&clang=_en

1.3 International conventions relate to transboundary watercourses

The important role played numerous global conventions that, at least in part, relate to transboundary watercourses.

Climate change is a major challenge for water management. In the years to come, climate change will increase the likeness of flooding, droughts and other consequences throughout the water cycle. Climate impacts will in turn affect aquatic ecosystems.

This climate impact should be used in state practice and agreements concerning long-term of cooperation at the transboundary level on environmentally sustainable adaptation of water resources to climate change. The basic legal framework offer the UNECE instruments. The UNECE Water Convention includes the precautionary principle, which implies taking action even before adverse impacts are fully proven scientifically. The Convention facilitates transboundary cooperation on adaptation to climate change through its provisions and mechanisms for institutional cooperation. Also, the Espoo Convention may provide a framework for ensuring that activities proposed within the framework of a country's adaptation strategies do not cause significant adverse transboundary impacts in neighbouring countries. Its Protocol on Strategic Environmental Assessment introduces climate change considerations into the development of plans and programmes.

UN United Nations Framework Convention on Climate Change was adopted on June 1992 and entered into force on December 1992 (status in force: Romania 1994, Moldova 1995 and Ukraine 1997), does not specifically aim to enable transboundary climate change adaptation through the sustainable and cooperative management of international watercourses;

In relation to watercourses, parties are obliged “to develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods”(art.4(1) (e)).⁹

Including climate change adaptation in river basin management can help to regulate adaptation approaches in decision-making, financing, awareness-raising and stakeholder participation, resulting in the more sustainable use of human and environmental resources.

The concept of integrated water resource management should be based on monitoring and observation systems of functioning of water resources, ready to adapt to the climate changes, based on collection information from different water-related sectors (e.g. navigation, hydropower, tourism, public health, agriculture, drinking water facilities). Drought and desertification (Art.2 (2)) is also covered in the ***UN Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa*** (status in force: Romania 1998, Moldova 1999 and Ukraine 2002).

⁹ [Convention on Climate Change](https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXVII-7&chapter=27&Temp=mtdsg3&clang=en).

https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXVII-7&chapter=27&Temp=mtdsg3&clang=en

Desertification Convention requires states to promote the restoration, conservation, and sustainable management of land and water, and to cooperate with each other for the protection of those resources. It also requires neighboring countries to cooperate towards tackling any harmful conditions relating to those resources, such as drought and desertification in developing action programs, which may include the joint sustainable management of transboundary water resources.

The process of monitoring and assessment of functioning of water resources should be principal for identifying early the knowledge about the risks, as the magnitude of the hazard, the degree of exposure to the hazard and overall socioeconomic and environmental vulnerability, in aim to identify early prevention activities. In the transboundary context, the process of monitoring and assessment of vulnerability assessments should be regulated with the participation of all riparian countries with aim to create a common management plans of the vulnerabilities in the whole basin.¹⁰

The **Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat** (status in force: Romania 1991, Moldova 2000 and Ukraine 1991) was adopted on February 1971, entered into force on December 1975.

According to the art.5 of the Ramsar Convention “contracting parties shall consult with each other about implementing obligations arising from the Convention especially in the case of a wetland extending over the territories of more than one contracting party or where a water system is shared by contracting parties”.¹¹

Existing Ramsar resolutions further recognize the need for transboundary water cooperation, but available guidance only goes as far as to recommend, for example, that states jointly identify and manage transboundary wetlands, establish management regimes for shared river basins, and exchange expertise and information.

In this regard, the **Biological Diversity Convention** (status in force: Romania 1994, Moldova 1995 and Ukraine 1995) by art.14 obliged the states to notify, exchange information and enter into consultations an activities in one state’s jurisdiction or control that are likely to significantly adversely affect the biodiversity of other states. (was adopted on June 1992 and entered into force on December 1992)

The Convention on Biological Diversity (CBD) promotes the conservation and sustainable use of biodiversity, especially through the protection of ecosystems. At the same time, the CBD respects countries’ sovereign rights over biological resources within their own territories.¹²

Recognizes freshwater flows needed to protect ecosystems and includes natural conditions, transboundary environmental effects, and the conservation of water resources among the factors that must be considered in the promotion of reasonable and equitable water use and benefit-sharing across borders.

¹⁰ Desertification Convention, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-10&chapter=27&clang=en

¹¹ Ramsar Convention, http://archive.ramsar.org/cda/en/ramsar-documents-texts-convention-on/main/ramsar/1-31-38%5E20671_4000_0

¹² Convention on Biological Diversity, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-8&chapter=27&clang=en

The integrated water resource management in the transboundary context should be based on monitoring the chemical composition of water, a number of key biological elements, and the hydrological and morphological characteristics of water bodies in order to provide a comprehensive overview of the health of waters. All riparian countries track some, if not all, of the essential biological parameters in their monitoring programmes. These parameters include: phytoplankton, larger water plants, bottom-living invertebrate animals and fish.

1.3 Regional conventions and basin agreements

Reading the reports of the ILC's special rapporteurs on the Law of International Watercourses for Uses other than Navigation, the large quantity of regional and local practice cited for supporting universal principles is impressive.¹³

These legal norms contribute to the progressive implementation of universal principles, for instance, in dealing with environmental protection and issues of public participation or with the creation of river commissions. Regional and basin agreements have put into place numerous joint bodies on transboundary freshwater resources, which facilitate and ensure the regular exchange of information, are important tools for co-operation and for the prevention of water disputes between riparian states.

The protection of transboundary rivers and lakes is addressed in a much more extensive manner by the *UNECE Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes* was adopted in March 1992 and entered into force on the 6 October 1996. (status in force: Romania 1995, Moldova 1994 and Ukraine 1999) An interesting element is that the Convention being a regional instrument, by the amendment from 2003¹⁴, which aims at extending the Convention's geographic scope, the aspiration towards more universality was achieved.

The convention as legal instrument promote the equitable utilization and environmental protection of international watercourses, catalyzing regional approach of equitable utilization and sustainable development around the world.

In general, both instruments, UN Convention and UNICE Convention do not contradict each other. According to the art.1.1 the scope of the Helsinki Convention is wider than that of the UN Convention the notion of transboundary waters covers any surface- or ground-waters which mark, cross or are located on boundaries between two or more States and is addressed in a much more extensive manner of their physical relationship, a unitary whole and normally flowing into a common terminus. The Convention contribute to the progressive codification in the formulation norms and principles on the regional level, which is more attentive to the protection of the environment based on the precautionary and polluter-pays principles and issues of public participation or with the creation of river commissions.

A distinctively "European" feature of the Helsinki Convention is the emphasis that's put on public participation. The 1997 UN Convention only vaguely touches on the principle, while the Helsinki Convention contains a set of obligations with respect to the provision of the information to the public. Another distinctive element of the 1992 Helsinki Convention deals with institutional mechanisms. At the regional level,

¹³ Third Report on the Law of Non-Navigational Uses of International Watercourses', in Yearbook of the International Law Commission, 1987, Vol.II, (1).

¹⁴ UNECE Water Convention, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-5&chapter=27&clang=_en

the Helsinki Convention binds states - the territories of which border or are crossed by the same transboundary waters - to create common institutional organs, in addition, according to the art.3 of the Convention, joint institutional mechanisms are entrusted with various tasks: they have to draw up joint action programs, monitor and evaluate the quality of water jointly, facilitate joint research and development activities, set up channels for the ongoing exchange of information, and set up warning mechanisms and systems for mutual assistance in emergency situations. (for instance, the 1994 Danube River Protection Convention established a joint mechanism entrusted with environmental tasks, the International Commission for the Protection of the Danube River)¹⁵

The Helsinki Convention contains a set of obligations:

- ensure the regular exchange of information as a tool for co-operation and for the prevention of the disputes between riparian states;
- requires an ecologically common rational management of waters;
- addresses the conservation and restoration of damaged ecosystems.

This approach is also found in the two additional protocols of the Helsinki Convention which were adopted; *the Protocol on Water and Health* to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes, from 17 June 1999, and the *Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters*, from 21 May 2003.

The *Protocol on Water and Health*, which entered into force in 2005, aims at promoting a progressive approach to issues relating to the protection of health and the human well-being through the improvement of water management and the fight against waterborne diseases.¹⁶

The scope of the *Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters* is to establish a comprehensive civil liability mechanism and adequate compensation regime in the case of damages caused by transboundary impact of industrial accidents on international waters.¹⁷

In the UNECE Convention, the general obligation to prevent, control and reduce transboundary impact (so-called no-harm rule) is expressed in terms of “due diligence”, as opposed to absolute obligations. Its due diligence nature is determined by the duty to take “all appropriate measures” aimed at prevention, control and reduction of transboundary impact. The concept of “appropriateness” of the measures required involves a significant amount of relativity and presumes that measures should be proportionate to the capacity of the Party concerned, as well as

¹⁵ Laurence Boisson de Chazournes. Freshwater and International Law: The Interplay between Universal, Regional and Basin Perspectives, available at:

<https://unesdoc.unesco.org/ark:/48223/pf0000185080/PDF/185080eng.pdf.multi>

¹⁶ Protocol on Water and Health, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-5-a&chapter=27&clang=en

¹⁷ Protocol on Civil Liability, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-16&chapter=27&clang=en

to the nature and degree of the risk of occurrence of transboundary impact in the light of the specific circumstances.¹⁸

The number of international and regional norms which incorporate such obligation as not to cause harm has grown.

The three Conventions have the same definitions of “transboundary impact” and apply the same approach to defining to cause harm represents the limit of equitable utilization of a watercourse. The Water Convention uses the expression “significant adverse effect”, which provides an abstract standard of guidance for the assessment of the acceptable threshold of harm. The concrete assessment of the “significance” threshold depends on the specific situation in the catchment area, including the specific circumstances pertaining to the Riparian Parties involved. The Espoo Convention (by defining the list of activities that are likely to cause significant adverse transboundary impact) and the Industrial Accidents Convention (by defining the quantities of hazardous substances) provide useful parameters for the determination of the respective thresholds.

The principle of equitable and reasonable utilization, provided for in the Water Convention and generally recognized as part of international customary law, is particularly relevant in cases where there is a “conflict of uses” between riparian’s on a transboundary watercourse. Practical implementation of this principle requires a case-by-case assessment, mutual exchange of data and information on a basin, as well as consultations and cooperation. Another key obligation – the obligation of cooperation – is instrumental to full compliance with the obligation of prevention, control and reduction of transboundary impact and the principle of equitable and reasonable use.

The multilateral meaning of equitable utilization between riparian’s is supported by common institutions and coordinated management policy of transboundary watercourses and based on monitoring and assessment of water resources.

The monitoring and assessment of water resources is of fundamental importance, as it forms the basis for rational decision-making and for water management.

The Water Convention is one of the most essential legal instruments for the monitoring and assessment of transboundary waters in the UNECE region and requires Parties to undertake joint monitoring and assessment programmes of their shared transboundary waters. Guidelines on monitoring and assessment of transboundary rivers, lakes and groundwaters were developed to assist riparian countries in these tasks. Furthermore, Parties and non-Parties carry out regular assessments of transboundary surface and groundwaters in the framework of the Convention by establishing programmes for monitoring the conditions of transboundary waters, therefore requiring countries to provide for effective monitoring systems for the national parts of transboundary basins.

Obligations relating to the monitoring and assessment of specific river basins that stem from bilateral or multilateral agreements should be in line with the

¹⁸ ¹⁸ Laurence Boisson de Chazournes.p.3

requirements of the Water Convention. In particular, joint bodies - any bilateral or multilateral commission or other appropriate institutional arrangements for cooperation between Riparian Parties - have a specific role in monitoring and assessment.¹⁹

Under *The Protocol on Water and Health* to the 1992 Convention, effective systems for monitoring and assessing situations likely to result in outbreaks or incidents of water-related disease and for responding to them or preventing them should be established. This will include inventories of pollution sources, surveys on high-risk areas for microbiological contamination and toxic substances, and reporting on infectious and other water-related diseases. The Parties must also develop integrated information systems to handle information about long-term trends in water and health; current concerns, past problems and successful solutions; and the provision of such information to the authorities. Moreover, comprehensive national and/or local early warning systems are to be established, improved or maintained.²⁰

Several bilateral and multilateral agreements on transboundary waters among UNECE countries support action required by the Water Convention.

The *Convention on the Protection of the Black Sea against Pollution* (status in force: Romania 1993 and Ukraine 1994) was signed by the countries bordering the Black Sea in Bucharest in April 1992 and is therefore also referred to as "Bucharest Convention". The document and its (three) integral protocols (*Protocol on the Protection of the Black Sea Marine Environment against Pollution from Land Based Sources*, *Protocol on Cooperation in combating pollution of the Black Sea Marine Environment by Oil and Other Harmful Substances (Emergency Protocol)*, *Protocol on the Protection of the Marine Environment Against Pollution by Dumping*) includes Ecosystem Quality Objectives; short, medium and long term targets; and legal and institutional reforms and investments necessary to solve main environmental problems. The main obligation of the Contracting Parties to prevent, reduce and control the pollution in the Black Sea in order to protect and preserve the marine environment and to provide legal framework for co-operation and concerted actions to fulfil this obligation.²¹

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (status in force: Romania 1993, Moldova 1994 and Ukraine 1999) is a binding international legal instrument aiming to conserve wild flora and fauna and their natural habitats, as well as to promote interstate co-operation in this field. In 1989, contracting parties to the Bern Convention launched the creation of a special tool for the protection of European natural habitats: the Emerald Network.²²

Being developed within the framework of the Bern Convention, as an ecological network, the Emerald Network is a system of coherent interconnected areas that are subject to management, monitoring and reporting measures.²³

¹⁹ Guidelines on monitoring and assessment of transboundary rivers, lakes and groundwaters, p.5

²⁰ Strategies for monitoring and assessment of transboundary rivers, lakes and groundwaters, p.5

²¹ Bucharest Convention, <http://www.blacksea-commission.org/convention-fulltext.asp>

²² Emerald Network description, <https://www.coe.int/en/web/bern-convention/emerald-network>

²³ <https://www.coe.int/en/web/bern-convention/emerald-network>

Convention on Co-operation for the Protection and Sustainable Use of the Danube River (Sofia, June 1994) (status in force: Romania 1998, Moldova 1999 and Ukraine 1998) serve as a basis for bilateral agreements, initiatives, and development to ensure that surface waters and groundwater within the Danube River Basin are managed and used sustainably and equitably. International cooperation for the Danube Rivers has a long history from 1856, when was signed a treaty ensured free navigation on the river.

In the Danube River basin, coordinated water monitoring work links member states with nine neighbouring countries outside the EU. The Danube TransNational Monitoring Network, officially launched in 1996 by the International Commission for the Protection of the Danube River, has 79 monitoring stations throughout the Danube basin. (Water Note 6)²⁴

The Republic of Moldova contributes to the Danube river basin management plan elaboration process, through elaboration of hydrographic basin district management plans of the Danube -Prut Rivers, in accordance with the provisions of the Water Law nr.272 of 23 December 2011.

1.4 Bilateral cooperation

With regard to international relations, Ukraine and Moldova have bilateral intergovernmental cooperation agreements on water use.

Treaty between the Government of the Republic of Moldova and the Cabinet of Ministers of Ukraine on Border Waters Common Use and Protection signed on November 23, 1994. The treaty established the institution of Plenipotentiaries in scope to contribute in ensuring the conservation and improvement of ecological and sanitary state of water bodies and water management systems.

Moreover, an essential platform for developing trans-border cooperation with Moldova is the Bilateral Treaty on the Sustainable Management between the Government of the Republic of Moldova and the Cabinet of Ministers of Ukraine on cooperation in the field of protection and sustainable development of the Dniester river, signed in 2012. This Treaty contains the provisions concerning the measures meant to prevent and mitigate the harmful effect of waters, including floods and sudden overflows.

The Dniester Commission is a body for intergovernmental cooperation between the Republic of Moldova and Ukraine in the area of protection, sustainable use and development of the Dniester River Basin. Its main objective is to implement measures aimed at achieving the rational and environmentally sound use and protection of water and other natural resources and ecosystems of the Dniester River Basin in the interests of the population and sustainable development of the states.²⁵

²⁴ Water Note 6 Monitoring programmes: taking the pulse of Europe's waters, available at: http://ec.europa.eu/environment/water/participation/pdf/waternotes/water_note6_monitoring_programmes.pdf

²⁵Website of the Dniester Commission, <https://dniester-commission.com/en/joint-management/dniester-commission/>

The general objective the Agreement of 1994 and the Treaty of 2012 does not coincide, because the Agreement applies to all border waters, but the Treaty applies to the Dniester River Basin. **1.4 Non-binding declarations, codes, guidelines**

Recognized, that the actions to protect the environment need to be developed more quickly, in this context in the last twenty - five years, in a more flexible manner, the environmental legal framework developed as a so-called soft-law approach, through the use of non-binding declarations, codes, guidelines.

These and other soft-law instruments influence the development of the legal regime established by the Convention, also facilitating its implementation by providing clear and concrete parameters concerning the conduct required for full compliance.

The building of dams for hydropower provision can have an enormous adverse effect on water resources and livelihoods, especially in the poorest nations.

The International Hydropower Association was approved the *Hydropower Sustainability Assessment Protocol* in 2011 and is governed by a multi-stakeholder council. The intent of the Protocol is to measure and to guide sustainability in hydropower planning implementation.

Provides specific requirements for prior notification on planned measures and consultation and negotiation. Conform Art. 7 states "take all appropriate measures' not to prevent significant harm". Part III encourages the implementation of joint EIAs procedures and supports cooperation between watercourse states through the mitigation of transboundary impact and the attainment of optimal solutions.

The issue of climate change best illustrates the flexibility and responsiveness of UNECE environmental instruments. Several soft-law instruments (in particular, the *Guidance on Water and Adaptation to Climate Change*) have been developed.

The Guidance is based on experience and good practices in the UNECE region. This Guidance aims at providing step-by-step advice for the development of sound adaptation strategies and thereby supporting countries in their implementation of the Water Convention and its Protocol on Water and Health in the context of climate change. The Guidance aims to put special emphasis on the specific problems and requirements of transboundary basins, with the objective of preventing, controlling and reducing transboundary impacts of national adaptation measures and thereby preventing and resolving possible conflicts related to the impact of climate change on water resources.²⁶

Guidelines for Developing National Strategies to Use Air and Water Quality Monitoring as Environmental Policy Tools. The aim of these Guidelines is to provide guidance to countries of Eastern Europe, the Caucasus, Central Asia and South-Eastern Europe (hereinafter "the target countries") with respect to revising their air and water quality monitoring programmes to make monitoring a practical tool for environmental policy, especially for target setting, for the development of pollution

²⁶ Guidance on Water and Adaptation to Climate Change, p.12

abatement strategies and for assessing progress in achieving policy targets and the effectiveness of abatement measures.

The main message of the present guidelines is that water quality monitoring systems should become an integral part of national water management systems and should therefore be designed, developed and interpreted in a broader policy, economic, technical and scientific context. When developing or upgrading national water management systems, the river-basin approach is strongly recommended, especially with regard to the institutional setting. Finally, water quality monitoring systems should provide data on transboundary rivers and other international water bodies and should therefore be coordinated with relevant international programmes.²⁷

1.5 International Judicial Practice

International and European Judicial practice contributes to uniformity in the courts' application of the environmental laws. Judicial practice plays an important role in the improvement of environmental legislation: as the courts apply the laws, they thereby ascertain the efficacy of existing norms and reveal the gaps, contradictions, and other shortcomings in the legislation in force. The most known water disputes as the River Meuse case (1937) Trail Smelter Arbitration (1941); Gabčíkovo-Nagymaros Project (Hungary v. Slovakia)(1997), Pulp Mills on the River Uruguay Argentina v. Uruguay (2010) have been became a special mechanism, the primary purpose of which is to assist states in settling their international controversies.

Sustainable development

The Rio Declaration's principle 3 states "the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations". Taken together with other Rio principles (principles 2 and 4 in particular) 39 sustainable development requires the integration of environmental and developmental (i.e., social and economic) policies.

The International Court of Justice (ICJ) has also taken under consideration notions related to sustainable development, particularly in its judgment in the Case concerning the *Gabčíkovo-Nagymaros Project (Hungary/Slovakia)*, in which Hungary had sought to abandon a project to build a system of barrages on the Danube partly on sustainable development grounds. The Court stated in paragraph 140 of the judgment: Throughout the ages, mankind has, for economic and other reasons, constantly interfered with nature. In the past, this was often done without consideration of the effects upon the environment. Owing to new scientific insights and to a growing awareness of the risks for mankind – for present and future generations – of pursuit of such interventions at an unconsidered and unabated pace, new norms and standards have been developed, set forth in a great number of instruments during the last two decades. Such new norms have to be taken into consideration, and such new standards given proper weight, not only when States contemplate new activities but also when continuing with activities begun in the past. This need to reconcile economic development with protection of the environment is aptly expressed in the concept of sustainable development.

²⁷ Guidelines for Developing National Strategies to Use Air and Water Quality Monitoring as Environmental Policy Tools, p.29

In the Case Concerning Pulp Mills on the River Uruguay (Argentina v. Uruguay), the ICJ found that the existing river management agreement between the States reflected the “need to strike a balance between the use of the waters and the protection of the river consistent with the objective of sustainable development.”²⁸

Environmental impact assessment

Article 12 of the United Nations Watercourses Convention requires that the notification be supplemented by “available technical data and information, including the results of any environmental impact assessment that may enable the notified State to evaluate the possible effects of the planned measures”.

the Court in the *Pulp Mills* case:

.....It may now be considered a requirement under general international law to undertake an environmental impact assessment where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context, in particular, on a shared resource. Moreover, due diligence, and the duty of vigilance and prevention which it implies, would not be considered to have been exercised, if a party planning works liable to affect the régime of the river or the quality of its waters did not undertake an environmental impact assessment on the potential effects of such works²⁹

The evolution of the ‘no significant harm rule’

Article 7(1) of the United Nations Watercourses Convention, provide that states shall, in utilizing an international watercourse in their territories, and take all appropriate measures to prevent the causing of significant harm to other watercourse States.

Trail Smelter Case

.....no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another when the case is of serious consequence and the injury is establishing by clear and convincing evidence.

²⁸ The Aarhus Convention An Implementation Guide, Second edition, 2014 p.27

²⁹ Attila Tanzi. New York 2015

Chapter 2 European Union legal framework

2.1 Overview of Water Framework Directive

In the 7th EU Environment Action Programme, “Living well, within the limits of our planet”, the EU formulates an engaging vision of the future to 2050: a low carbon society, a green, circular economy and resilient ecosystems, as the basis for citizens well-being.

The EU is leading the way through policies such as the 2030 Climate and Energy package, the Europe 2020 Strategy and the Horizon 2020 research and innovation programme and EU’s focus is seek to balance social, economic and environmental considerations.

Hydropower plays a key role in the contributing to the EU energy targets for 2020-2030. As with all other water-based activities, hydropower must conform to the requirements of EU environmental law, which has been introduced to protect and restore Europe’s rivers and lakes. These legal requirements are laid down in the Water Framework Directive, the Floods Directive, the Birds and Habitats Directives, and the Environmental Assessments Directives (Environmental Impact Assessment - EIA and Strategic Environmental Assessment - SEA Directives).

This chapter outlines some of the key provisions of these EU laws that are relevant for hydropower in the context of management of transboundary water resources and adaptive measures to climate change impacts.

The Water Framework Directive (WFD), adopted in 2000, is arguably the most ambitious piece of European Union (EU) legislation in the field of water. The directive defines a general framework for integrated river basin management in Europe with a view to achieving “good water status” by 2015. Institutional novelties include, among others, water planning at hydrological rather than administrative scales, the involvement of nonstate actors, various economic principles as reflected in tools such as cost-effectiveness analysis, and a common strategy to support EU member states implementing the directive.³⁰

Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy establishes an innovative approach for water management based on river basins, the natural geographical and hydrological units and sets specific deadlines for Member States to protect aquatic ecosystems. The directive addresses inland surface waters, transitional waters, coastal waters and groundwater. It establishes several innovative principles for water management, including public participation in planning and the integration of economic approaches, including the recovery of the cost of water services.

What Are the Key Actions to implement this EU instruments:

³⁰Kallis and Butler 2001, p.125

- To identify the individual river basins lying within their national territory and assign them to individual River Basin Districts (RBDs), and identify competent authorities (Article 3, Article 24);

Many rivers start as rushing mountain streams and then become slow, broad waterways when they flow through gentle plains. Moreover, a river's health changes as it is used by humans for discharging water from industry, households and agriculture. In designating individual water bodies, Member States consider all these factors, from the physical differences - including altitude, geology and size - to the levels of pollution, extraction and other pressures. By designating separate water bodies along the course of a river, Member States can focus monitoring activities on problems affecting specific water bodies. They can then tailor measures to improve conditions in the water bodies at risk. Governments, stakeholders and the public will be able to track the progress of these measures in improving the status of the bodies at risk. (Water Note 2)

- To characterise river basin districts in terms of pressures, impacts and economics of water uses, including a register of protected areas lying within the river basin district (Article 5, Article 6, Annex II, Annex III);

The directive allows to designate some of their surface waters as heavily modified water bodies or artificial water bodies whereby they will not need to meet the same quality criteria required of other surface waters. They will need to meet the “good ecological potential” criterion for these ecosystems rather than “good ecological status”. However, artificial and heavily modified bodies will still need to achieve the same low level of chemical contamination as other water bodies. (Water Note 4)

- -To carry out the inter-calibration of the ecological status classification systems (Article 2(22); Annex V);

- *The directive sets the basic requirements for measuring the health of surface water ecosystems. It identifies four common “quality elements” to be used in determining ecological status: phytoplankton; other aquatic flora; benthic (bottomdwelling) invertebrate fauna; and fish fauna. (Water Note 7) To make operational the monitoring of water status (Article 8);*

Monitoring is the main tool used by Member States to classify the status of each water body (a water body is a section of a river or other surface water or a distinct volume of groundwater). The directive sets a five-class scale - high, good, moderate, poor and bad status - for surface waters and 2 classes - good and poor - for groundwater, and it requires Member States to achieve good status in all waters by 2015.

The directive specifies three types of monitoring. Long-term surveillance monitoring provides a broad understanding of the health of water bodies and tracks slow changes in trends such as those resulting from climate change. Operational monitoring focuses on water bodies which do not meet good status and on the main pressures they face - pollution where this is the main problem, water flow where extraction creates risks. Operational monitoring thus tracks the effectiveness of investments and other measures taken to improve the status of water bodies. Member States also undertake investigative monitoring when they need further

information about surface water bodies that cannot be obtained via operational monitoring, including information on accidents. In addition to these three main types of monitoring, Member States need to carry out more detailed analysis in areas that are protected for drinking water or for natural habitats and species. (Water Note 6)

- **Based on sound monitoring and on the analysis of the characteristics of the river basin, to identify a programme of measures for achieving the environmental objectives of the Water Framework Directive cost-effectively (Article 11, Annex III);**

One of the key innovations of the directive is its call for water services - such as supplying clean drinking water, irrigation for agriculture, reservoirs for hydropower and wastewater treatment facilities - to be charged at a price which fully reflects the services provided. Under the directive the recovery of costs refers to several elements. The prices users pay for water should cover the operational and maintenance costs of its supply and treatment and the costs invested in infrastructure. The directive goes further and requires that prices paid by users also cover environmental and resource costs. This is a key step towards implementing the economic principle that polluters and users should pay for the natural resources they use and the damage they create. (Water Note 5)

- **To produce and publish River Basin Management Plans (RBMPs) for each RBD including the designation of heavily modified water bodies, by 2009 (Article 13, Article 4.3);**

- **To implement water pricing policies that enhance the sustainability of water resources (Article 9);**

- *River basin management plans integrate environmental goals, social concerns and economic factors for all types of bodies of waters - rivers and lakes, estuaries and other transitional waters, coastal waters and groundwater. For each river basin district, the plans define the bodies of water not meeting the directive's environmental targets and describe the reasons for this, such as what is causing problems and risks. They contain a programme of measures - the actions and activities to be carried out to address these pressures and maintain or improve the quality of the water.*

According to the Water Framework Directive, each plan should contain the following information:

- *A general description of the characteristics of the river basin district, including maps;*
- *A summary of the main pressures and human impacts;*
- *A map of specially protected areas (e.g. bathing waters, areas for habitats or species protection);*
- *A map of the monitoring networks;*
- *A list of the environmental objectives or targets;*
- *A summary of the programme of measures to maintain or improve water status;*
- *A summary of the public consultations and their influence on the plan;*
- *A list of competent authorities and a contact point for receiving more information. (Water Note 12)*

- **To make the measures of the programme operational (Article 11);**

The directive addresses inland surface waters, transitional waters, coastal waters and groundwater. Article 10 details the directive's "combined approach for point and diffuse sources" and refers to several related directives. The list in Annex VI, Part A includes inter alia the directives on: Bathing Water (76/160) (now replaced by 2006/7) Drinking Water (80/778, as amended by 98/83) Urban Wastewater Treatment (91/271) Nitrates (91/676)). Sewage Sludge (86/278) The directive regards implementation of these other directives as a minimum requirement. The measures to implement them must be integrated into river basin management planning.

- **To implement the programmes of measures and achieve the environmental objectives (Article 4).**

The Water Framework Directive is supported by other EU environmental legislation. The REACH Regulation controls chemicals in products to reduce the contamination of water bodies. The Directive on Plant Protection Products (i.e. pesticides) controls pollution from agricultural chemicals and the Biocidal Products Directive regulates pest-control and anti-microbial substances used in other sectors. The Nitrates Directive limits nitrogen pollution from fertilizers and manure. The Directive on Industrial Pollution Prevention and Control (IPPC) regulates pollution from factories and other facilities.

Climate change:

The directive's river basin approach to water management - centered on the review of river basin management plans every six years - establishes a mechanism to prepare for and adapt to climate change. Planning for droughts and floods will also be an integral part of this system.

In this regard is the relationship between water resources management and climate change, should to be taken into account, and a policy and legislation support developed to address these adverse effects.

Regulation (EU) No1293/2013 of the European Parliament and of the Council of 11 December 2013 on the establishment of a programme for the environment and climate action (LIFE) and repealing Regulation (EC) No 614/2007. OJ : JOL_2013_347_R_0185

The programme has two subprogrammes (environment and climate action). It also introduces integrated projects, which operate on a large scale, starting at regional or multi-city level. These aim to implement environmental and climate change policy by applying plans and strategies based on EU legislation and integrating these policies further into other policy areas.

Main objective include seven **thematic priorities**: nature and biodiversity; water, including the marine environment; waste; resource efficiency, including soil and forests and **green and circular economy**; environment and health, including chemicals and noise; air quality and emissions, including the urban environment; and information and governance.

Regulation No.525of the European Parliament and of the Council of 21 May 2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change and repealing Decision No 280/2004/EC (OJ L 165, 18.6.2013, pp. 13-40)

- enhances the **monitoring, reporting and review** procedures and rules, which allows for the implementation of domestic and international commitments;
- establishes an EU-wide **greenhouse gas inventory** system that seeks to strengthen transparency and completeness between the GHG inventories of EU countries;
- incorporates EU countries' information on their **planning and strategies for adaptation to climate change**, covering aspects such as flooding, draughts and extreme temperatures;
- strengthens the reporting by the EU and EU countries on **financial and technological support** provided to developing countries; and
- ensures the **timeliness, transparency, accuracy, comparability and completeness of data** reported by the EU and EU countries.³¹

2.2 The Floods Directive

Directive 2007/60/EC on the assessment and management of flood risks entered into force on 26 November 2007. This directive requires to assess if water courses and coast lines are at risk from flooding, then to map flood risks and finally to take adequate and coordinated measures to reduce the risk.

- prescribes a series of common steps across the EU to reduce the adverse consequences of flooding. for many member states,
- introduces a new approach that shifts the focus of policy from defensive works against floods to integrated risk management;
 - a)required to prepare preliminary flood risk assessments for all river basin districts identifying the areas where further action is needed.
 - b)states will need to prepare flood hazard and flood risk maps for these areas. *The flood hazard maps will show the geographic areas that could become flooded in the case of low, medium and high probability events. Risk maps will then show the potential impact of flooding outlining the number of citizens and the types of economic activities that could be affected.*
 - c) states will draw up flood risk management plans, which coincides with the second cycle of river basin management plans;

The flood management plans will identify goals and actions to reduce flood risks and protect human lives, economic activities and ecosystems and cultural heritage. These plans should also ensure that Member States are prepared when floods strike. (Water Note 10)

2.3 The SEA and EIA Directives

Public participation

The Water Framework Directive acknowledges that its success relies on close cooperation with the public and stakeholders at local level and their involvement in key decisions (Article 14). To ensure the participation of the public and stakeholders

³¹ Regulation (EU)No.525/2013 of the European Parliament and of the Council

in establishing and updating river basin management plans, the directive recognises that it is necessary to provide proper information to the public of planned measures before final decisions on the measures are adopted. Once a plan is in place, authorities need to report on the progress of its implementation to the public and stakeholders by application of the *Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC - Statement by the Commission.*

Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment aims to provide for a high level of protection of the environment. It aims to do this by ensuring that the environmental consequences of certain **plans and programmes** are identified, assessed and taken into account during their preparation and before their adoption.

A strategic environmental assessment is mandatory for a variety of plans and programmes which set the framework for future consent of the development of projects listed in the EIA Directive.

Under the SEA process, Member States are required to prepare an environmental report that assesses the likely significant environmental effects of the plans and programmes, and the effects of any reasonable alternatives.

Ultimately, the SEA aims to encourage a more integrated and efficient approach to territorial planning where environment, including biodiversity considerations, are taken into account much earlier on in the planning process and at a much more strategic level.

While the SEA process is for plans and programmes, EIA Directive 2011/92/EU, as amended by Directive 2014/52/EU (commonly referred to as the 'EIA Directive'), is for individual public and private projects. Thus, the consent to develop a project which is likely to have significant effects on the environment should be granted only after the project's likely environmental effects have been assessed.

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment focuses on the physical impact of the project on the environment, while the assessment in SEA, bearing in mind the larger scale and less precise data, focuses rather on the achievement of relevant environmental objectives. However, when plans and programmes provide enough details with regard to the planned activities also physical impacts can be assessed.

2.4 Coordination between the WFD and the Nature Directives

The Water Framework Directive and the two Nature Directives are closely interlinked as they both aim to protect and restore Europe's freshwater ecosystems. They should therefore be implemented in a coordinated way to ensure that they operate in an integrated manner.

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora seeks to contribute to ensuring biodiversity in the European Union by the conservation of:

- natural habitats, and
- wild fauna and flora species.

Directive sets up the 'Natura 2000' network, the largest ecological network in the world. Natura 2000 comprises **special areas of conservation** designated by EU countries under this directive. Natura 2000 also includes the **special protection areas** classified under the Birds Directive (Directive 2009/147/EC).

Directive 2009/147/ EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds

Directive policies seek to conserve all wild birds in the EU by setting out rules for their protection, management and control. It covers birds, their eggs, nests and habitats.

Recognizing the alarming loss of biodiversity in Europe, the target of this documents are rapidly improve the practical implementation of the Habitats and Birds Directives and accelerate progress towards the EU 2020 goal of halting and reversing the loss of biodiversity and ecosystem services.

They enable all EU Member States to work together, within a common legislative framework, to conserve Europe's most endangered, vulnerable and valuable species and habitats across their entire natural range within the EU, irrespective of political or administrative boundaries.

2.5 Directives concerning integrated pollution prevention and control

The Marine Strategy Framework Directive (2008/56/EC) establishes a common basis for the protection and management of Europe's seas and cites four existing conventions for the protection of Europe's regional seas: the Baltic Sea Area, the North-East Atlantic, the Mediterranean and the Black Sea. These four conventions will provide the framework for co-operation on the new marine strategies with neighboring non-EU countries.

Member States will also need to coordinate the implementation of the Marine Strategy Framework Directive with their actions on the Water Framework Directive since the two pieces of legislation are closely linked. The Water Framework Directive will reduce pollution from land-based sources from reaching Europe's seas to improve marine conditions. The directive also protects coastal waters as well as transitional waters such as estuaries and coastal lagoons. These provide spawning grounds for many marine fish species and are a crucial link between freshwater and marine ecosystems. Together the two directives provide a complete structure for the protection and management of Europe's freshwater and marine waters.

Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control).

To control industrial emissions, the EU has developed a general framework based on integrated permitting. This means the permits must take account of a

plant's complete environmental performance to avoid pollution being shifted from one medium - such as air, water and land - to another. Priority should be given to preventing pollution by intervening at source and ensuring prudent use and management of natural resources.

The Water Framework Directive developed and implemented a comprehensive system of water quality assessment and management. Annex VIII of the WFD established a first indicative list of main pollutants (dangerous substances). The hazardous substances are the substances already indicated in the list I and II of the ***Directive 2006/11/EC of the European Parliament and of the Council of 15 February 2006 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community***. The priority substances are all those which present a significant risk both directly or via an aquatic environment, including risks to waters used for the abstraction of drinking water. Among them, hazardous substances are identified in order to set up interventions to eliminate their emission and loss in the aquatic environment. The first step of this EU strategy is a list of priority substances and hazardous priority substances, adopted by Decision 2455/2001/EC, which identifies 33 substances of priority concern ***Decision No. 2455/2001/EC of the European Parliament and of the Council of 20 November 2001 establishing the list of priority substances in the field of water policy and amending Directive 2000/60/EC***.

Besides the requirements for the quality of surface water, EU legislation includes special provisions for the quality of drinking water by the ***Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption***, bathing water by the ***Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality***, water for fish by the ***Directive 2006/44/EC of the European Parliament and of the Council on the quality of fresh waters needing protection or improvement in order to support fish life and water for shellfish by the Directive 2006/113/EC of the European Parliament and of the Council of 12 December 2006 on the quality required of shellfish waters***. In addition, the requirements related to the reduction of emissions/discharges should be taken into account (e.g., directives concerning urban waste water treatment (***Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment***), water pollution from agricultural sources (***European Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources***) and integrated pollution prevention and control (***Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control***).

Council Directive (96/82/EC) on the control of major-accident hazards - also known as the Seveso II Directive. It has been in force since 3 February 1999 tightens the procedures:

- public consultation on projects, plans and programmes involving plants covered by the legislation.
- ensures, through changes to land-use planning laws, that new plants are sited a safe distance away from existing ones,

- allows people to **go to court** if they consider they have not been properly informed or involved,
- introduces **stricter inspection standards** for the various installations, to ensure the safety rules are being effectively implemented.

Chapter 3. Assessment of the impact of hydropower on freshwater ecosystems

3.1 Types of ecosystem changes important to monitor under hydropower impact

As reflected by Table 1, In accordance to literature study, the hydropower impacts could be classified into two major categories: Hydro-morphological and ecological changes.

Table 1. Overview of the major types of impacts and indicators of change for hydropower

N/cat	Types of impact	Main indicators of change
1.	Hydromorphological changes	<ul style="list-style-type: none"> - Flow regime - Sediment dynamics - Groundwater level - Water course, status of beds and banks
2.	Ecological changes	<p>Changes at the habitat level</p> <ul style="list-style-type: none"> - Changes and loss of habitat diversity and quality (related to impaired hydraulic conditions and sediment transport and building of structures) <p>Chemical and physio-chemical elements supporting the biological elements</p> <ul style="list-style-type: none"> • Transparency • Thermal conditions • Salinity • Oxygen regime • Sediment and nutrient loads (accumulation of nutrients due to decreased level of self-purification processes) • Specific Pollutants: priority substances discharged into the body of water <p>Change in biological communities:</p> <ul style="list-style-type: none"> • richness and diversity of fish species; • abundance, • composition of invertebrate species or guild structure (e.g. from lentic to lotic specialist species or guilds); • changes in flow-dependent invertebrate life-stage metrics (e.g. mussel recruitment to 2nd year class); changes in recruitment of invertebrate (e.g. <i>Corbicula</i>) and vertebrate species (e.g. fish); • changes in macrophyte diversity; • rate of phytoplankton development.

(Sources: 1.WFD and Hydromorphological pressures technical report, 2- European Commission, 2018 Guidance on the requirement for hydropower in relation to EU nature legislation, 3- Higgins, J. Konrad, Ch., Warner, A., Hickey, J. (2011). A framework for monitoring, reporting and managing dam operations for environmental flows at sustainable river project sites).

Regarding the changes of the freshwater ecosystems under synergistic effect of hydropower and climate change, the following aspects shall be taken into consideration (2):

- a) Ecological flows - maintaining of optimal flows which are essential for maintaining a healthy river ecosystem and a good ecological status of the water bodies. Considering such aspects is important during the reproduction periods of fish, particularly during low precipitation level in the spring, when the water level is naturally low in order to reduce drying of sensitive fish eggs and juveniles. Fish migration upstream can also be hampered if the flow will be too low because of insufficient stimuli encouraging fish to migrate. Inadequate flow can cause overheating of water and insufficient oxygenation, which will create unsuitable living conditions for fish, crayfish, bivalve molluscs dependent on flowing water habitats.
- b) Hydro-peaking - sudden oscillations in the water level can cause damage to species sensitive to such changes (juvenile fish and aquatic plant species). The effect of hydro-peaking is particularly acute during sensitive periods (e.g. during drought or frost). Another aspect to consider is also a significantly lower temperature of the discharged water. This can lead to decrease in sensitive species to temperature changes.
- c) Changes in seasonal flood cycles - interventions in flow control can result in the disruption of the seasonal flood cycles, causing the complete disappearance of the target habitat types or species connected to these cycles. To make conclusions of the potential risk at ecosystem level, the changes in the seasonal flood cycles shall be correlated with actual and projected precipitation level.

3.2 The views of EU norms on assessing hydropower impact

In accordance to **Water Framework Directive (WFD)**, the impact changes could be assessed by comparing the obtained monitoring results (as stated above hydro-morphological and ecological changes) with those of reference conditions. In accordance to are at high status. A high status means the ecosystems encounter no, or very minor disturbance from human activity. Based on the comparison of biological reference conditions with those monitored it is possible to obtain an Ecological Quality Ratio (EQR). Among the most important indicators of water with high status are such as: phytoplankton, macroalgae and benthic invertebrate fauna. The values of the EQR set for each status class indicate that the water body meets the normative definition for that status class given in Table 3 and each biological quality element meets the relevant definition stated by WFD. The EQRs will allow a comparison of high status sites between different locations. The reference conditions are not permanent. Climate, land cover and marine ecosystems vary naturally over many periods relevant to the WFD. It is recommended that reference conditions must therefore be formulated so as to include natural variability over a period of **at least six years**, and other factors directly out of the control of the countries.

Table 2 Characterization of the status of rivers, lakes, transitional waters and coastal waters in accordance to Annex V of Water Framework Directive

The status	Main characteristics
High status	<p>“There are no, or only very minor, anthropogenic alterations to the values of the physicochemical and hydromorphological quality elements for the surface water body type from those normally associated with that type under undisturbed conditions. The values of the biological quality elements for the surface water body reflect those normally associated with that type under undisturbed conditions, and show no, or only very minor, evidence of distortion. These are the type specific conditions and communities.”</p>
Good status	<p>“The values of the biological quality elements for the surface water body type show low levels of distortion resulting from human activity, but deviate only slightly from those normally associated with the surface water body type under undisturbed conditions.”</p>
Moderate status	<p>“The values of the biological quality elements for the surface water body type deviate moderately from those normally associated with the surface water body type under undisturbed conditions. The values show moderate signs of distortion resulting from human activity and are significantly more disturbed than under conditions of good status.”</p>
Poor status	<p>“Water showing evidence of major alterations to the values of the biological quality elements for the surface water body type and in which the relevant biological communities deviate substantially from those normally associated with the surface water body type under undisturbed conditions, shall be classified as poor.”</p>
Bad status	<p>“Water showing evidence of severe alterations to the values of the biological quality elements for the surface water body type and in which large portions of the relevant biological communities normally associated with the surface water body type under undisturbed conditions are absent, shall be classified as bad.”</p>

Since it is recognized that currently there are very few or no water bodies of high status (reference conditions), the WFD identifies other alternative options for describing the reference conditions:

1. **Historical data and information.** The historical information is used to derive reference conditions if they are of assured quality. If reference conditions are derived from historical conditions, these should be based upon the condition of water bodies at times of no or very minor anthropogenic influence.
2. **Modeling** A number of different modelling techniques may be used to derive reference conditions. Annex V 1.3 (v) “Type-specific biological reference conditions based on modelling may be derived using either predictive models or hindcasting methods. The methods shall use historical, palaeological and other available data and shall provide a sufficient level of confidence about the values for the reference conditions to ensure that the conditions so derived are consistent and valid for each surface water body type.

3. Expert Judgment Expert judgment is used for deciding which data are appropriate. In addition, robust predictive models can only be developed using monitoring data plus expert judgment.

3.3 The statement of Habitats Directive (5) regarding the assessment of the impacts of Hydropower

EU nature legislation requires that any plan or project likely to have a significant effect on one or more Natura 2000 sites³² undergo appropriate assessment (AA) under Article 6(3) of the Habitats Directive (4). Commonly used methods for predicting the impacts are:

- **Direct measurements** may be taken, for example of areas of habitat lost or affected, proportionate losses from species populations, habitats and communities.
- **Flow charts**, networks and systems diagrams can identify chains of effects resulting from direct effects; indirect effects are termed secondary, tertiary, etc. effects in line with how they are caused. Systems diagrams are more flexible than networks in illustrating interrelationships.
- **Quantitative predictive models** can provide mathematically derived predictions based on data and assumptions about the force and direction of effects. Models may extrapolate predictions that are consistent with past and present data (trend analysis, scenarios, analogies which transfer information from other relevant locations) and intuitive forecasting. Normative approaches to modeling work backwards from a desired outcome to assess whether the proposed project will achieve these aims. Predictive modeling often plays an important role as the main effects often follow from changes in hydro-morphological structures, resulting in changes in sedimentation regime with serious consequences for underwater biota.
- **Population-level studies** are potentially beneficial for determining population-level effects of effects on bird or bat or marine mammal species, for instance.
- **Geographical information systems (GISs)** are used to produce models of spatial relationships, such as constraint overlays, or to map sensitive areas and locations of habitat loss. GISs are a combination of computerized cartography, stored map data, and a database-management system storing attributes such as land use or slope. GISs enable the variables stored to be displayed, combined, and analyzed speedily.
- Information from previous similar hydropower projects may be useful, especially if quantitative predictions were made and have been monitored in operation.
- Expert opinion and judgment can be obtained from previous experience and consultations on similar projects, and from local experts with experience and knowledge of the site.
- **Description and correlation:** physical factors (e.g. the water regime, current, substrate) may be directly related to the distribution and abundance of species. If future physical conditions can be predicted then it may be possible to predict the future development of habitats and populations or the responses of species and habitats on this basis.

³² Europe's most valuable and endangered habitats and species

- **Capacity analyses** involve identifying the threshold of stress below which populations and ecosystem functions can be sustained. It involves identifying potentially limiting factors, and devising mathematical equations to describe the capacity of the resource or system in terms of the threshold imposed by each limiting factor.

3.4 Example of hydropower Impact scaling (Czech Republic)

The hydropower impact could be scaled using numerical values in accordance to the level of severity. Such an example is the one used by experts in Czech Republic, in which the impact significance is assessed against each target feature of a given site. If the impact on even a single target feature is marked with ‘-2’ it automatically means the site integrity is adversely affected and such a project must not be granted a permit within Article 6.3 procedure of Habitat Directive.

Value	Term	Description	Example
-2	Significant adverse impact	Significant adverse impact. Excludes plan/project implementation - The area is characterized by significant disturbance or destructive impact on habitat or species population or its substantial part; significant disturbance of ecological demands of the habitat or species; significant impact on the habitat or natural development of a species. Under certain conditions, the impact can be lowered by mitigation measures.	Disruption of migration routes to spawning places of anadromous species Destruction of habitat by inundation because of new dam. Hydrological changes because of derivation significantly influencing population.
-1	Moderately adverse impact	Limited/moderate/non-significant adverse impact. Plan/project implementation is not excluded. Moderate troublesome impact to habitat or species population; moderate disruption of ecological demands of habitat or species; marginal impact on	Modernisation – using technology less damaging to fish, building fish passes on existing barriers. Impact on margin parts of population. Influence on habitat common in surrounding area

		habitat or natural development of a species. Its elimination through mitigation measures is possible but application of mitigation measures cannot be enforced, unless national legislation requires differently.	
0	Zero impact	The plan/project has no demonstrable impact.	Outside area of occurrence
+1	Moderately positive impact	Moderate favorable impact on habitat or species population; moderate improvement of ecological demands of the habitat or a species; moderate favorable impact on the habitat or on the natural development of a species.	Reconstruction of peaking hydropower to run-of-river hydropower without weir or dam.
+2	Significantly positive impact	Significant favorable impact on habitat or species population; significant improvement of ecological demands of habitat or a species, significant favorable impact on the habitat or natural development of a species.	Demolition of hydropower plant.

Chapter 4 National legal framework (Republic of Moldova, Romania and Ukraine)

4.1 Review of national legislation of the Republic of Moldova, Romania and Ukraine relating to monitoring of surface waters and transboundary use of aquatic resources and cooperation on adaptation to climate change

The EU obligations from the water directives are, in principle, aimed to be achieved by each individual State, but due to the transboundary nature of water management, these objectives can only be achieved, however, if the parties are situated in a transnational river basin (EU Member States and non-Member States) cooperate. European integration aspirations of Moldova and Ukraine give a very good base for integration of the water quality monitoring systems in the development of the planning documents and their further implementation in the Moldova and Ukraine of the Dniester basin.

The main political document for actions in line with EU standards harmonizations in water management policy in Moldova and Ukraine is the Action Plan, based on the Association Agreement with the European Union

The National Environmental Strategy 2014-2023³³ doesn't contain actions related to the cross-border collaboration and promotion the integrated system of water management, but several important actions are foreseen in the Action Plan for its implementation:

- identification of river basins and districts and the establishment of administrative arrangements on transboundary rivers, lakes and other bodies of water;
- ensuring the economic analysis of water using, the impact of human activity on water quality and river basin characteristics, river basin management plans of the Nistru, Danube-Prut and the Black Sea.

The Strategy of National Ecological Policy of Ukraine until 2020 aim to reform, during the first stage, the state governance system in the area of protection and efficient utilization of waters through introduction of integrated management of water resources under the basin principle.³⁴

The main objective of of integrated management of water resources under the basin principle policy are stipulated in water legislation in Ukraine (Water Code 1995), Romania (Water Law 1996) and Moldova (Law on Water 2011).

Ukraine and Moldova have interest in co-operation in water management and protection of transboundary rivers. Development of the effective water quality control measures on transboundary rivers is an essential component in the interstate water quality management policy for waters pollution abatement. The international water-related agreements provide good basis for development of national and international activities in this area. The following activities concerning water quality control development have been undertaken by Ukraine, Moldova and Romania: a) harmonization of national regulations and standards; b) creation of transnational

³³ The National Environmental Strategy 2014-2023, approved by Government Decision No. 301 of April 24, 2014, available at: <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740>

³⁴ The Strategy of National Ecological Policy of Ukraine until 2020, available at: <https://menr.gov.ua/en/content/misiya-ta-strategiya.html>

water monitoring networks to provide structured and well-balanced overall views of pollution status, as well as of the long-term development of water quality and pollution loads; c) prevention and control of accident pollution. Providing these measures is not an easy task, especially in countries, which face economical and environmental problems.

One of the principal terms in water management and protection on transboundary rivers is a creation and maintenance of water quality monitoring system which can carry out observations, processing of data and provision users with systematic information about water quality status of water bodies. This information is the key prerequisite for accurate assessments of the water quality and the magnitude of water problems. Moreover, water quality management and protection within transboundary river basins calls for harmonized and comparable the water national monitoring programs.³⁵

Generally, the present surface water quantity and water quality monitoring systems in Ukraine and in the Republic of Moldova were inherited from the former Soviet Union. The water quality monitoring systems of the Republic of Moldova and Ukraine (these countries were the republics of the former Soviet Union) function on similar principles. These countries use the basin approach of river basin management. These factors help to co-ordinate activities in area of water quality monitoring between these neighboring states.

In Ukraine, the national activity in the field of surface water quantity and water quality monitoring is regulated by the Water Code of Ukraine (1995), the Law on Environmental Protection (1991), the Law on Hydrometeorological Activity, the order of the Cabinet of Ministers of Ukraine No. 758 of September 19, 2018 "On Approval of the Procedure for State Water Monitoring" will come into force from January 1, 2019 and the other Regulations of the Cabinet of Ministers of Ukraine.

In Ukraine the Law of Ukraine "On Potable Water and Potable Water Supply" 2002 ensure compliance with the EU standards.

In line with the WFD and the Water Laws of the states and other secondary legislation (for ex. Resolution of the Cabinet of Ministers No.336 18.05.2017 "On Approval of the Procedure for the Development of the River Basin Management Plan")³⁶ according to the principle of integrated management of water, Management Plans for each river basin district established should be developed.

For.ex. two hydrological districts Dniester and Prut-Danube and the Black was established and approved the Management Plans by a Committee with a consultative role (G D nr. 867 from 1 November 2013 (G D 775 from 04.10.2013)).

Identifying significant anthropogenic loads in Ukraine is regulated by the Methodical recommendations on identification of the main anthropogenic loads and their effects on the state surface waters, approved by the State Water Agency (protocol № 2 from November 27, 2018).³⁷

In Moldova the field of surface water quantity and water quality monitoring is regulated by the Law on Water 2013, Law on Environmental Protection 1993, Law on hydrometeorological activity (2003), Law on drinking water (1999), Law on Protection Zones and Strips of water, rivers and reservoirs (1995) and by the GD of the Monitoring Regulation and systematic evidence of surface water status and a groundwater from 29.11.2013.

Water standards are important parts of environmental and water laws, in

³⁵ Experience of Ukraine in the Development of the Water Quality Control on Transboundary Rivers, Abstract, Viacheslav Manukalo

³⁶ <https://zakon.rada.gov.ua/laws/show/336-2017-%D0%BF>

³⁷

Moldova is regulated by the Law on public service of water supply and sewer (2013) and GD of the Monitoring and systematic evidence of surface water status. Physical-chemical parameters, procedures and technical monitor measures (2013) and the GD for the approval of the Regulation on Environmental Quality requirements for surface waters (2013). Moldova has developed a Management Plan for the Dniester Basin District, which was approved by the Government Decree nr. 814, (2017).³⁸

Identifying significant anthropogenic loads in Moldova is regulated by the GD on the approval of the Regulation on requirements for the collection, treatment and discharge of wastewater into the sewer system and / or receivers for urban and rural settlements of the Republic of Moldova from November 25, 2013 nr. 950³⁹ and the the Law of the Republic of Moldova On Public Service water supply and sewerage from December 13, 2013 nr. 303.⁴⁰

The Water Framework Directive has been transposed into Romanian legislation by the Water Law 107/1996 with subsequent amendments. The Romanian Law on Quality Potable Water nr.311 from 2002 and GD nr.100 from 2002 Quality requirements for surface waters and methodology of accounting samples from surface water is establish the water standards.

According to the Water Law, the Plan of Management is the main tool of planning, development and monitoring of water resources at the river basin level and consists of the River Basin Management Plan - management component and Quantitative River Basin Management Plan - the qualitative management component. The Methodology and Technical Instructions for elaboration of Hydraulic River Basin Management Plans approved by the Minister of Environment and Waters Management, Ordin nr. 1.258 / 2006.

In Romania the National Management Plan is updated to an implementation cycle of 6 years and is approved by Government Decision nr. 859/2016, the Update of the National Management Plan is related to the period 2016-2021.

The above mentioned water quality monitoring system has common limitations and problems, the most important of which are as following:

- lack of clearly formulated goals and objectives of monitoring system reflecting its relationship with water quality management activity. *Ex. in the WFD it is stipulated that state authority should make all efforts to achieve “good” status for all water resources. However, Water Code of Ukraine and Law on Water of the Republic of Moldova there is no emphasize that all water plans must include now this common Goal - achieving “good” status. The opportunity to introduce in Ukraine and Moldova of European mechanism to define a “good” status, by using not only the maximum allowable concentrations (MAC), but, first of all, basing on deviation from the reference state, taking into account the impacts on aquatic biota, was also missed. Thus the opportunity to implement the concept of resilience, which is important for understanding of necessity of adaptation to climate change, into Ukrainian and Moldovan water policy was lost.*⁴¹
- unclear distribution of responsibilities between national authorities involved in the monitoring, poor co-ordination among them, resulting in duplication of some functions and loose of the others, for.ex. *in Moldova and Ukraine numerous institutions are involved in environmental management but the*

³⁸ <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=371992>

³⁹ <http://lex.justice.md/md/350537/>

⁴⁰ <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352073>

⁴¹ Yuliya Vystavna, Maryna Cherkashyna. p.5

quality of their performance is low and so is the co-ordination between these. The environmental authorities are weak and they lack political influence;

- *legislative gaps in transparency and lack of sanctions, Ex. in 2015, the European Commission launched an infringement procedure against Romania thanks to the pressures of local communities and NGOs. The procedure concerned small hydropower plants investments in three Natura 2000 sites. The Commission confirmed that Romanian authorities did not comply with the Water Framework Directive and the Habitats Directive. OECD (2011)⁴²;*
- *significant discrepancies between different laws on property rights and the responsibilities of natural resource users;*
- *quite limited possibility for estimation of special parameters of pollution and detection of emerging issues;*
- *a lack of modern information technologies and limited possibilities for dissemination, processing and presentation of information;*
- *water quality assessment based on outdated and inflexible the maximum allowable concentrations system, For ex., water quality and quantity standards were set for more than 1000 parameters in the 1980s and based on maximum allowable concentrations (MAC) of contaminants established for drinking water supplies, house- hold use, fisheries and other needs of the population. This number of parameters is significantly higher than defined in the Water Directive. Practically water quality monitoring is limited to about 80 parameters, with only about a third of them being similar to those in the Water Directive.⁴³*
- *inadequate financial and logistics support of the monitoring activity, because the environment is not a top priority for Government of the Republic of Moldova and Ukraine.*

In accordance to the Regulation approved by the Government Decision nr.890of the Republic of Moldova, from 12 November, 2013 (5) the classification of the status of the surface waters is done based on parameters of water quality indicated in the Annex 1, using the results of the monitoring of water quality, of 3 consecutive years. In accordance to this classification, the surface waters are classified into 5 quality classes:

- **I class - Very good** (could be probable compared to the reference conditions stated in the WFD) - no alterations or minor alterations of physico- values of physico-chemical and biological quality parameters;
- **II class - (Good)** - slightly affected by human activity, that could ensure the suitability of water for any uses;
- **III class (moderately polluted)** - the surface water of which physico-chemical and biological values deviate moderately from the natural reference values of water quality under the impact of human activity;
- **IV class (polluted)** - surface water shows proofs of major deviation of the physico-chemical and biological values from the reference conditions due to human activities;

⁴² The EU Environmental Implementation Review Country Report – ROMANIA. SWD Brussels (2017)

⁴³

- **V Class (highly polluted)** - the surface waters indicate signs of major deviations of the physico-chemical and biological quality values of water from the reference values under the impact of human activities.

The national regulation of the Republic of Moldova which discusses the requirements for monitoring of surface waters is the Regulation on monitoring and systematic evidence of the state of surface and underground water approved by the Government Decision nr. 932 from 20.11.2013) (6). This regulation states the types of monitoring (surveillance monitoring, operational monitoring and investigative monitoring), the parameters and frequency of monitoring, monitoring network of surface waters in according to their hydrobiological, hydrochemical and ecological state of waters, the pollution sources, the stations of hydrological investigations, location of monitoring stations, the time of sample collection and the ways of disseminating the information to the public, as well as the requirements for joint investigation of transboundary ecosystems. In section III of this regulation it is stated "For transboundary water courses, the monitoring network and frequency of monitoring have to be sufficient for allowing the state in accordance to the transboundary agreements". The current quality criteria are mainly used for assessing the impact of pollutants, but not of the impact of hydropower. An important consideration of the Regulation on monitoring and systematic evidence of the state of surface and underground water, which is useful for monitoring of impact of hydropower in the context of climate change, is the volume of water flow or the quota of water level needed to be measured that along with the hydrobiological and hydrochemical parameters.

The Floods Directive has been transposed into Romanian legislation by the Water Law 107/1996 with subsequent amendments, National Strategy for Flood Risk Management on medium and long term (G.D. 846/2010) and the Government Decision 972/2016 for approval of Flood Risk Management Plans. The Action Plan on disaster-related emergency situations 2015-2020 was approved by the Decree of the Cabinet of Ministers of Ukraine № 419-p, 25 March 2015 and methodology of accounting for emergency situations № 738 from 9 October 2013 implement Risk Management Concept in Ukraine. In Moldova has been transposed into Governmental Regulation on Flood Risk Management no.887 of 11 November 2013. The Regulation is substantially in line with the requirements of Floods Directive for the preparation of Preliminary Flood Risk Assessment (PFRA), Flood Hazard Mapping (FHM) and Flood Risk Mapping (FRM) and Flood Risk Management Plans (FRMPs).

The legal framework of Moldova and Ukraine is substantially in line with the requirements of Floods Directive, however it does not set a clear time framework for the implementation of each step of the directive and provided a very general roadmap including multiple stakeholders into the various steps towards the inclusion of Risk Management into the Ukrainian and Moldovan CP system. A clear legal reference and a formal system for the evaluation of lesson learned have not been introduced yet.

There is a need to develop secondary legislation in terms of specific, consistent implementing regulations, procedures and guidelines, which could provide user-friendly information. Necessary to draft sub-legislation to clarify which institution will be in charge of coordinating working groups for each hazard.

Also for effective implementation it is recommended to include flood risk management principles in line with Floods Directive into the river basin management

plans and to improve the efficiency of the observational network by modernizing, reequipping technically and technologically, increasing the number of and further developing automated stations engaged in measuring water levels, rainfall etc.

Another recommendation is to develop and adopt in current legislation a methodology for multi-sectoral economic assessment of disaster losses. Furthermore it is recommended to develop and implement capacity building actions for national and local institutions on the use of the methodology.

Moldova and Ukraine actively taking measures to transform the Soviet standards to the EU. The evidence can be found in the Law of the Republic of Moldova on Water (2011) and Water Code 1995 of Ukraine, which is partially harmonized with EU legislation on urban wastewater treatment, bathing waters, assessment and management of flood risks, and environmental quality standards in the field of water policy. Adaptation of the Moldovan and Ukrainian water legislation to EU requirements resulted in better sewage control, protection of water resources from pollution, greater responsibilities of wastewater treatment plants, development of a basin approach and introduction of environmental risk assessment and management.⁴⁴

Above mentioned deficiencies make difficult to develop the international cooperation of Ukraine and Moldova with its western neighbor Romania.

The results of the comparative analysis of the Ukrainian (Law on SEA into force -12.10 2018), Moldovan (Law on SEA into force -07.03 2018) and Romanian (GD into force -05.08 2004) legislation on environmental impact assessment in compliance with the requirements of EU Directives, shown that the after certain clarifying amendments to the legislation are made, the Ukrainian and Moldovan side will be able to initiate the joint assessment, to be carried out together, but there are no provisions regarding the post-monitoring provided by art. 12 of the SEA Protocol and Art. 7 of the Espoo Convention. This mechanism can offers the real opportunity for the states to intervene with post-monitoring and to obtain a new assessment of the impact of already functioning objects.

Current water laws in Romania, Moldova and Ukraine include only general legislative provisions, without direct measures and implementation. For their execution, numerous regulations and instructions were developed, including governmental regulations, standards, building codes, norms, rules of water use and other regulatory documents.

4.2 Climate Change and security in the Dniester River Basin

Ukraine, Moldova and the EU have signed and ratified the Paris Agreement, which imposes a number of new international legal obligations on the parties. One of the Paris Agreement's requirements is to prepare and implement a low carbon development strategy until 2050. Agreement specifies that each of its parties is to define and communicate a national target relating to the global response to climate change (expected NDC). Thus, Ukraine and the EU have common commitments under their Association Agreement, as well as opportunities for cooperation and joint action. The Cabinet of Ministers in July 2018 has approved the Low Carbon Development Strategy for Ukraine until 2050 - document supporting the strategy for transitioning the Ukrainian economy to a low carbon development model, which provides for reducing greenhouse gas emissions, abandoning fossil fuels and investing in renewable energy sources.

⁴⁴ Yuliya Vystavna, Maryna Cherkashyna. p.7

On 6 December 2017, was approved the Action Plan on the Execution of the Concept of Implementation of State Climate Change Policy until 2030 by the Cabinet of Ministers.

Moldova was approved a Climate Change Adaptation Strategy with Plan Action up to 2020 in 2014 by the GD. A new vision in developing and ensuring the implementation of state climate change policy was approached by the Low-Emission Development Strategy of the Republic of Moldova up to 2030 was approved by the GD of Republic of Moldova.

Romania's position in climate change adaptation policy is reflected in the overall position of the European Union. The National Climate Change Strategy was adopted by the GD nr.645 and the National Climate Change Action Plan by the GD nr.1877 in 2005.

Many problems in practice regarding climate change adaptation are being addressed within the context of sector-based strategies and implementation programs and plans (including environmental protection, the use of water resources, agriculture, energy, construction, transportation, emergency response and public health).

For example, In Moldova, was approved in 2011 the Program to Develop Water Resource Management and Water Conservation for 2011-2020 as a Conceptual Framework for National Policy in Water Resources for improving the performance of the water resources sector.

In fact, these documents are responsible today for the bulk of practical adaptation activities, but many of these programs are not fully funded and these far from all of them explicitly address potential climate change factors.

Another priority with evaluation of the efforts to tackle climate change, is elaboration the legal framework for national monitoring, detailed reporting and periodic assessment of greenhouse gas emissions.

In Moldova was approved Government Decision on establishing and operation of the National System for monitoring and reporting greenhouse gas emissions and other information relevant to climate change in December 2018. In Ukraine has`nt been approved regulations on setting up, monitoring and reporting GHG emissions.

Instead, Romania has a significant progress by approving the GD nr.1570/2007 on establishing System for evaluation of the greenhouse gas emissions and other regulations and decisions for good implementation of the objectives of the Strategies. Among them are the Regulation on the management of the national GHG emissions register nr.1474/2007, the Guide on monitoring and reporting GHG emissions under the marketing scheme nr. 589/2007 and National Plan on quota distribution nr.60/2008/

Paris Agreement was ratified by all three states, in which gave up the static and discrete approach to national GHG emissions reduction commitments, but no Paris ruleregulation has been adopted so far, and there are reasonable concerns that it will not be adopted so far . A modern model of relations must provide for changing dynamics in the parties international commitments and national circumstances.

The influence on climate change impact should be considered when applying tools such as the strategic environmental assessment and the environmental impact assessment.

More attention should be paid to adaptation to the effects of climate change, especially important for Ukraine_ and Moldova in this regard is the relationship between water resources management and climate change: the probability of a future lack in potable water resulting from climate change needs to be taken into account, and a policy and legislation support developed to address these adverse effects.

For ex. at the Danube River Basin level, under the coordination of the International Commission for the Protection of the Danube River (ICPDR), it was developed in 2012 Climate Change Adaptation Strategy for the Danube River Basin, which takes into account the link between the Water Framework Directive and the Floods Directive, the framework conditions, scenarios of climate change, water impact, vulnerability to climate change and possible adaptation measures. The impact of these climate changes on water bodies mainly consists of seasonal changes of flow, low flow situations and water scarcity with the possibility of becoming more severe, and also heavy rainfall or more, both locally and regional.

4.3. Good practice in mitigation effects and restoration measures to hydropower

Cumulative negative effects can observe only over time. It is important to consider all plans or projects during the assessment. This includes any plans and projects which have been approved in the past but which have not yet been implemented or completed, as well as any existing pressures and threats.

Recommendations on small hydropower plants, Federal Environment Agency, Germany

In Germany, around 80 % of the usable hydropower potential has already been exploited. The technological potential was also largely exhausted. This was reflected in the relatively low rates of support available for hydropower use in support programmes. The remaining exploitable potential therefore mainly concerns small, previously undeveloped, virtually undisturbed waters. Yet the possible harmful ecological effects on the few remaining small undisturbed watercourses in Germany are likely to be considerable.

Macro-economic cost-benefit analysis has also shown that the economic costs can be considerable, compared with the benefit. The smaller the installation's capacity and the more natural the watercourse, the less favourable the cost-benefit analysis is. Economic evaluations show that, especially with **small hydroelectric power plants with a capacity of up to 100 kW**, in all three cases of new construction, modernisation and reactivation, the cost of producing energy is higher than the rates of payment under the Renewable Energy Act. Therefore in many cases, even in favourable circumstances, **electricity can hardly be produced economically.**

Economic considerations show that a subsidy that covers the operating costs of small hydroelectric power plants – in particular plants with a capacity of under 100 kW – leads to high macro-economic costs for the avoidance of CO₂ emissions. **Against the background of negative ecological effects, further exploitation of the potential of small hydroelectric power plants is not a priority for climate protection.**

Considering prevailing legal provisions and the requirements of the EC Water Framework Directive, the following recommendations have been put forward:

- On account of their higher efficiency, **large hydroelectric power plants are generally to be given preference to small and micro-installations** for secondary use on waters already developed and impounded. When developing hydropower capacity attention should be focused on their optimisation.
- With virtually undisturbed waters, or those where re-naturalisation is planned, the use of hydropower should be renounced.
- The construction and reactivation of **small hydroelectric power plants is**

unproblematic at existing weirs that cannot be demolished, in particular when, at the same time, ecological improvements – for instance, restoring free passage – can be achieved.

–With the reactivation of installations currently not in operation, and the renewal of water rights, concerns of water protection should be more strongly considered and conditions laid down (for example, functional fish ladders, structurally-guaranteed dynamic minimum water flow, exclusion of flash floods downstream dams).

–**In the case of new installations, impounding of a water body for diversion is to be avoided.** Constructional methods should be chosen, which divert the water used in such a way that the free passage and character of the watercourse is maintained (e.g. lateral water intake with a diversion structure in the water body). Requirements are to be issued on minimum flow and on measures for the avoidance of damage to fish from turbines. Flash floods downstream of dams are to be prohibited.⁴⁵

The Kembs project: environmental integration of a large existing hydropower scheme, France

The Kembs dam diverts water to the Grand Canal d'Alsace, which is equipped with four hydropower plants. The Old Rhine river, downstream of the dam, is 50 km long and has been strongly affected by dykes since the 19th century. As the Kembs scheme concerns three countries with varying views on how to deal with the environment, Electricity de France decided to take an **integrated approach** to achieving environmental improvements instead of striving for a strict 'impact/mitigation' balance.

This has resulted in:

–A **significant increase in ecological flow**: under a variable regime, the released flow varies daily depending on the natural flow entering the reservoir. A new plant (8.5 MW, 28 GWh) was built to limit the energetic losses and to ensure the daily modulation of flow in the Old Rhine.

–Strong **geomorphological movements** in the Old Rhine, with the supply of gravel from the new plant and the implementation of the original concept of controlled erosion.

–Actions to **ensure fish migration** (longitudinal and lateral) and the **recovery of wetlands**.

Examples of environmental measures include:

–*Connection between the Grand Canal d'Alsace and the wetland of the 'Petite Camargue Alsacienne'*. This protected area includes a **network of ponds and small waterways** that are reconnected to the Grand Canal d'Alsace as well as two new fish passes.

–*Controlled erosion*: This innovative concept uses floods' **natural erosion capacity to resupply the Old Rhine river with aggregates**, after the dykes are dismantled. The recovery of a non-fixed gravel bed will (in conjunction with the variable flow rate) enable fish spawning and the growth of pioneer vegetation. A small-scale model was used to determine the minimum excavations needed to activate the erosion.

–*Retrieval of an ancient Rhine river arm and its connected environment*: This large restoration project started in 2013. It involves the **conversion of a 100ha cornfield and the renaturalisation of an 8 km old river arm**. This re-natured area is now

⁴⁵ Abstract from: Hydroelectric Power Plants as a Source of Renewable Energy - legal and ecological aspects – Umweltbundesamt, November 2003
<http://www.umweltbundesamt.de/sites/default/files/medien/publikation/long/2544.pdf>

included in the Petite Camargue Alsacienne protected area, which is a partner in the project.⁴⁶

4.4 Good practice examples of in integrated planning approach to hydropower

The integrated approach considers both the infrastructure and the ecological needs at the outset and factors these into the initial project design, together with other land uses of the river. This approach promotes a more interactive and transparent planning process and encourages the active assistance and input from ecologists and other stakeholders from the beginning.

Developing sustainable hydropower in the Danube basin: guiding principles developed by the International Commission for the Protection of the Danube River (ICPDR)

In 2010, the Ministers of the Danube countries asked for guiding principles to be developed on integrating environmental aspects in the use of hydropower in order to ensure balanced and integrated development, and that potential conflicts of interest are dealt with from the outset. The guiding principles were drafted as part of a broad participative process involving representatives from energy and environment administrations, the hydropower sector, NGOs and the scientific community. They were adopted by the ICPDR in 2013 and make the following key recommendations:

General principles for developing sustainable hydropower

1. Hydropower development needs to respect the principles of sustainability, taking into account environmental, social and economic factors in an equally balanced way.
2. Renewable energy generation like hydropower should be part of a holistic approach to energy policies (national energy plan, including renewable energy action plans). Untapped renewable energy potential, energy savings and increasing energy efficiency are important points that should be considered in this approach.
3. In order to ensure sustainable hydropower development and to balance the different public interests, national/regional hydropower strategies should be drafted based on these basin-wide guiding principles. These strategies should consider the multifunctional use of hydropower infrastructure (flood control, water supply, etc.) and effects (including cumulative ones) on the environment.
4. Weighing the public interests at national/regional level has to be done in a transparent, structured and reproducible way based on criteria and relevant information, involving public participation at an early stage of the decision-making process.
5. Renewable energy production as such is not generally regarded as an overriding public interest. A hydropower project is not automatically of overriding public interest just because it will generate renewable energy. Each case has to be assessed on its own merits according to national legislation.
6. Involving citizens and citizens' groups, interested parties and NGOs whose interests are affected by a hydropower project is crucial in optimising the planning processes and developing a common understanding and acceptance in the practical implementation of new hydropower projects.
7. Hydropower development has to take into account the effects of climate change on

⁴⁶ <http://alsace.edf.com/wp-content/uploads/2015/06/20150610-Renaturation-Kembs-EDF-PCA.pdf>

the aquatic ecosystems and water resources (resilience of river habitats, quantity of flow, and seasonal changes of flow).

Technical upgrade of existing hydropower plants and ecological restoration

8. Technical upgrading of existing hydropower plants should be promoted to increase their energy production. These types of improvements are the most environmentally friendly way to achieve environmental objectives (e.g. WFD).
9. The technical upgrading of existing hydropower plants should be linked to ecological criteria for protecting and improving water status. National energy strategies and instruments should use incentives or eco-labels to promote and financially support technical upgrading.
10. The combination of technical upgrading with ecological restoration of existing hydropower installations implies a win-win situation both for energy production and for improving environmental conditions.

Strategic planning approach for new hydropower development

11. A strategic planning approach (linked to the renewable energy action plan and the river basin management plan) is recommended for the development of new hydropower stations. This approach should be based on a two-level assessment (including lists of recommended criteria), the national/regional assessment followed by the project specific assessment. This approach is in line with the prevention and precautionary principle as well as the polluter pays principle.
12. A first step identifies river stretches where hydropower development is forbidden by national or regional legislation/agreements (exclusion zones). In a second step, all other stretches will be assessed using the assessment matrix and classification scheme.
13. The national/regional assessment is an instrument to help administrations direct new hydropower stations to those areas where minimum effects on the environment are expected. This can be achieved by integrating hydropower production and ecosystem demands and by supporting decision making through clear and transparent criteria, including aspects of energy management as well as the environment and landscape. Danube-basin-wide or trans-border aspects need to be taken into account where appropriate.
14. The national/regional assessment benefits both the environment and water sector but also the hydropower sector since it increases the predictability of the decision-making process and makes transparent where licences for new projects are likely to be issued.
15. While the assessment at national/regional level is more of general nature, the project-specific assessment classifying the appropriateness of river stretches for potential hydropower use provides a more detailed and in-depth assessment of the benefits and effects of a concrete project. This helps in assessing whether a project is appropriately tailored to a specific location. The project-specific assessment is carried out in response to an application for issuing the licence for a new hydropower plant and therefore depends on the specific project design.
16. Current and new policy developments, in particular the implementation of EU legislation and the EU Danube strategy, should be reflected accordingly.
17. In order to support hydropower in the most sustainable way, incentive schemes for new hydropower projects should take into account the results of the strategic planning approach and adequate mitigation measures.

Mitigation of negative effects of hydropower

18. Mitigation measures have to be set to minimise the negative effects of hydropower installations on aquatic ecosystems. If national legislation provides for this, losses of hydropower generation from existing hydropower plants due to the implementation of mitigation measures may be compensated.

19. Ensuring fish migration and ecological flows are priority measures for maintaining and improving the ecological status of waters.
20. Other mitigation measures such as improving sediment management, minimising the negative effects of artificial water level fluctuations (hydropeaking), maintaining groundwater conditions or restoring type specific habitats and riparian zones are important for riverine ecology and wetlands directly depending on aquatic ecosystems. These measures should therefore be considered in the project design, taking into account cost-effectiveness and security of electricity supply.⁴⁷

Planning instruments to balance hydropower development and restore aquatic environments in France

In 2008, the French Ministry of Ecology, Sustainable Development and Energy held a round table discussion on how to further develop sustainable hydropower while restoring the aquatic environment in France. Two objectives had to be achieved: the generation of an additional 3 TWh in terms of annual production by 2020 and the achievement of good status on 66 % of surface water bodies by 2015.

After extensive discussions with local elected authorities, hydropower producers, the national committee for professional freshwater fishing and a number of NGOs, the Ministry signed an agreement containing four key objectives:

- to support hydropower through an ongoing process of shared research into environmental integration, monitoring and controls;
- to modernize and optimize existing plants by working towards an effective implementation of the regulations on raising the minimum flow by January 2014 and the introduction of obligatory fish passes. Further, any renewal of concessions should be accompanied by measures to improve both the energy and environmental performance of the plant;
- to remove the most problematic obstacles to ecological continuity which have been identified in the national program and to implement these restoration schemes with the help of funds from water supply agencies;
- to develop a ‘high environmental quality’ hydropower development scheme with minimum effect on the environment. Construction of new plants must be sought and placed preferentially in areas where few environmental stakes exist and must avoid areas of rich biodiversity (e.g. no-go rivers and continuity rivers).

Between 2012 and 2015 the government therefore adopted two lists of protected rivers to ensure compliance with the WFD. The first list contains no-go rivers or preserved rivers where the construction of any new obstacle cannot be authorised and existing dams must ensure ecological continuity at the moment their licence is renewed. The second list contains rivers where restoring continuity on existing dams is a priority. On these rivers, existing dams must be adjusted within 5 years to ensure both up- and downstream fish migration and a sufficient transfer of sediments.

The following are included in the first list: high status rivers (e.g. in Natura 2000), diadromous migratory fish rivers (also often in Natura 2000) and biological reservoirs. Together they represent around 25-30 % of the watercourses in France. The second list includes other diadromous migratory fish rivers, rivers at risk of failing the environmental objectives due to hydromorphological pressure and the inefficient functioning of biological reservoirs as determined in the river basin management plan. Together, they represent around 10 % of the watercourses.

The identification of potential areas for new hydropower under the regional

⁴⁷ Hydropower Case Studies and Good Practice Examples. ICPDR. 2013

renewable energy plans is based mainly on hydropower data and on compatibility with lists 1 and 2 which identifies areas that are considered appropriate, less appropriate or not appropriate.⁴⁸

⁴⁸ <https://circabc.europa.eu/sd/a/85a4834a-5733-4474-9686-d6d94d722b95/Presentation-Planning%20instruments%20for%20hydropower%20and%20preserved%20rivers%20in%20France.pdf>

Conclusions

The efficient use of water and effective management of natural water resources in a world where water resources are under significant pressure is about ensuring that natural water resources are sustained in terms of quality and quantity to meet the needs of humans, nature and the economy through integrated management.

The UN Convention on the Law of the Non-navigational Uses of International Watercourses was first legal instrument which promoting integrated water resources management, but the UNECE Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes was first instrument which to address some challenges identified at the national and local levels such as inadequate water management structures and weak capacity to regulate in the agreements integration aspects about environment and enforcement mechanisms.

The Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy followed the approach of the UNECE Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes requiring the setting up of river basin districts.

Multilateral environmental agreements, UNECE Conventions and Protocols, EU Directives and bilateral and multilateral transboundary water agreements contain obligations for countries to monitor and assess watercourses and to report, as appropriate, to a specific body, such as an international commission, secretariat or organization. Ideally, these obligations should become part of the national legislation to steer the activities in national competent bodies. It is, however, not realistic to expect all countries to amend their national legislation in the short term. In addition, national legislation should set out obligations and responsibilities for relevant agencies, such as hydro-meteorological services, environmental and health agencies, geological surveys and operators of water regulation structures and industrial installations to monitor and assess various components of the environment and report on the results.

Water legislation in Ukraine, Romania and Moldova is under transition period from passive environmental approach to new modern rules of equitable and reasonable water policy. This challenge requires significant changes in the terminology, structure and content of water laws in the overall concept of implementation practices and approaches water resource protection, based on International and regional norms.

The main problem of Ukraine and the Republic of Moldova in the field of water management in the fact that despite substantial decrease over the past 25 years of independence of the population, industrial production, water abstraction and discharges, the water quality shows no improvement. At the same time, water stakeholders keep explaining the fresh water quality deterioration by reduction of

water availability and consider water scarcity as the main problems of Ukraine and Moldova. It proves that promotion of IWRM and rethinking of water security (is still far from understanding and implementation in Moldova and Ukraine, despite the successful legal approval of European approaches to IWRM and environmental.

The implementation of WFD in Romania requiring co-ordination of the all involved parts at international, national and river basin level.

The existing Regulations of Moldova, Ukraine and Romania on assessing the impact from human activities are focused on pollution, no reference is given to hydropower impact, which is more acute and can have a more destructive effect at ecosystem level than the current level of pollution, which is reduced in comparison to the period, when intense industrial activity was performed. It is important to improve these regulations by adding data on monitoring of hydromorphological and ecological changes at ecosystem level, e.g. structural and functional changes occurring in freshwater ecosystems, production and destruction processes as well as auto-purification processes.

It is necessary to further strengthen this regional co-operation in transboundary river basin management on the administrative level. Here the EU Water Framework Directive may serve as a valuable source of inspiration to all parties involved. It focuses on river basin management plans as best models for a single system of water management instead of according to administrative or political boundaries.

Furthermore, attention should be given to the common standards and role of various stakeholders and secondary legislation, which need to develop in terms of specific, consistent implementing regulations, procedures and guidelines.

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