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Legal and economic key points regarding sustainable use of water resources

[1]Ruxandra M. Petrescu-Mag, and [2]Dacinia C. Petrescu

[1] Faculty of Environmental Sciences and Engineering, Babeș-Bolyai University, Cluj-Napoca, Romania, EU; [2] Faculty of Business, Babeș-Bolyai University, Cluj-Napoca, Romania, EU. Corresponding author: R. M. Petrescu-Mag, pmalina2000@yahoo.com

Abstract. The paper aims to provide the reader recent information on this topic. We offered a brief overview of main key points on sustainable use of water resources. We approached aspects on water law, water footprint and economic importance of water. We may consider the paper as a research tool for any person or organization interested in the water legislation and other issues connected to use of water resources.
Key Words:. water, resources, water footprint, legislation.

Resumen. El trabajo tiene por objeto proporcionar al lector la información más reciente sobre este tema. Nos ofreció una breve reseña de los principales puntos clave sobre el uso sostenible de los recursos hídricos. Nos acercamos a los aspectos de ley de aguas, la huella de agua y la importancia económica del agua. El articulo está diseñado para servir como una herramienta de investigación para cualquier persona u organización interesada en la legislación de aguas y otras cuestiones relacionadas con el uso de los recursos hídricos.
Key Words: agua, recursos, huella de agua, legislación.

Rezumat. Lucrarea urmărește să ofere cititorului informații recente cu privire la tema dezbătută. Am oferit o imagine de ansamblu asupra principalelor elemente legate de gestionarea durabilă a resurselor de apă. Am abordat aspecte legate de legislație apei, amprenta apei sau importanta economica a apei. În același timp, lucrarea poate servi drept instrument de cercetare pentru alte persoane și organizații interesate de legislația apei și alte subiecte legate de utilizarea durabilă a resurselor de apă.
Cuvinte cheie: apă, resurse, amprenta apei, legislație.

Introduction. Water may be considered a strategic resource as well as a trade good, thus sustainable water management programs must be implemented at local, regional, national and international scale. A growing interest towards water and wastewater management (monitoring, control, development of new technologies for efficient treatment of water and wastewater, pollution prevention programs, recycling and reuse applications, institutional development, public participation) and water availability have been observed in the last decades. Water resources management is about safeguarding the sustainability of a resource that has no substitute (O'Leary & Stalgren 2008; Petrescu-Mag 2009). The major interest slowly moved from the idea of pollution prevention and control towards the sustainable use of water resources (Teodosiu et al 2003). Sustainability as an overarching objective of human activities gained public attention as a consequence of 1987 World Commission on Environment and Development. The availability of water was emphasized explicitly as a requirement for sustainable development at the conference of Rio de Janeiro in 1992. European Union launched its Water Initiative (EUWI) at the 2002 World Summit for Sustainable Development in Johannesburg (United Nations 2002). The EUWI aims to meet the UN Millennium Development Goal of halving, by 2015, the number of people without access to safe drinking water and sanitation and improve water resource management. The main focus of the EUWI is to:

- reinforce political will and commitment to action
- promote improved water governance, capacity-building and awareness

- improve the efficiency and effectiveness of water management through multi-stakeholder dialogue and coordination
- strengthen coordination through promoting river basin approaches
- identify additional financial resources and mechanisms to ensure sustainable financing.

Academics generally have embraced the notion of sustainability, finding in it a single term that captures what some suggest might be a true paradigm shift in human attitudes towards economic development (MacDonell 1997).

Issues Related to Regulation and Enforcement of Water Law. Water law is broadly defined as law that does or might affect water resources. Water law also provides guidance for sorting out conflicts among and between competing human uses (MacDonell 1997). For each country there is a list of legal instruments: laws, norms, statutes, regulations etc. These lists enable viewers to get a sense of the entire body of water law. Unfortunately, these laws often do not provide a proper enforcement authority or, when they do, such authorities are not endowed with either the necessary funding or technical capacity to face their duties. In some instances, water laws may be confusing, highly technical, or may not provide for meaningful public participation mechanisms, if these are contemplated at all. In other instances, only general framework legislation on environmental resources was available and a specific law on water resources was missing. Given the specific characteristics of water resources, it did not seem enough to regulate this natural resource by means of framework legislation on environmental resources which legislates on other resources as well, rather than enacting a specific law on water resources (http://www.oas.org/dsd/EnvironmentLaw/WaterLaw/home.htm).

In the European Union, water legislation was one of the first sectors to be covered by environmental policy and it comprises more than 25 water-related directives and decisions. The Water Framework Directive (WFD 2000) came into force in December 2000 and it establishes a legal framework for the protection and management of water resources throughout the EU. The WFD is the most important EU directive in the water field over the past decades. It covers whole environmental sector water in one instrument (Chave 2001). The WFD integrates, for the first time, all issues related to an improved protection and management of all of Europe's water resources and aquatic environments. The WFD identified two areas where more specific legislation was needed: groundwater (art. 17) and priority substances (art. 16). The new Groundwater Directive was adopted by the European Parliament and the Council only recently, whereas the proposal for a Directive on Priority Substances is still under negotiation. Two additional recent legislative proposals will broaden the scope of the EU water policy and complete its comprehensive management and protection framework. These are the Directive on the assessment and management of floods and for a Marine Strategy Directive. The WFD requires "good water status" for all European waters by 2015, to be achieved through a system of participatory river basin management planning and supported by several assessments and extensive monitoring. The achievement of a good ecological and chemical status for all waters through the WFD should imply the achievement of quality standards to support fish and shellfish life. Nevertheless, nothing in the WFD explicitly prevents the lowering of standards from these Directives once they are repealed (Petrescu-Mag 2008). The implementation of the WFD raises challenges, which are widely shared by Member States (MS). These include: an extremely demanding timetable; the complexity of the text and the diversity of possible solutions to scientific, technical and practical questions; the problem of capacity building and an incomplete technical and scientific basis with a large number of fundamental issues in Annex II and V, which need further elaboration and substantiation to make the transition from principles and general definitions to practical implementation successful; a strict limitation of human and financial resources in MS further adds to the challenge (Petrescu-Mag 2008).

Economic Importance of Water. Many countries will face water scarcity, a problem that can be partially alleviated through the use of the non-conventional water resources. The combined effects of increasing demand for water for irrigation in the next decades

and the difficulties faced in the disposal of waste sewage and drainage water suggest that technological innovation and adaptation are relevant for effective and environmentally sustainable re-use (Hamdy 2000). This situation has determined the creation and development of economic instruments to contribute to a sustainable management of water resources use. European Union highlighted the fact that ineffective water pricing policies have contributed to a mismanagement of water resources in many areas. The WFD introduces economic principles and methods for the management of the European waters (European Commission 2008(a)). It is the first piece of EU water legislation that explicitly integrate economics into its measures. Article 9 of the directive calls for the recovery of the costs of providing water services. Article 5 requires an economic analysis of water use and Annex III lists the elements that MS should include in this analysis. In 2000, the European Commission issued a Communication that sets the agenda for implementing Article 9 of the directive, on "Pricing policies to enhance the sustainability of water resources". For many Member States the directive's use of economics has brought a new approach to water management (European Commission 2008 (a)). It introduces two key economic principles. First, it calls on water users – such as industries, farmers and households – to pay for the full costs of the water services they receive. Second, the directive calls on MS to use economic analysis in the management of their water resources and to assess both the cost-effectiveness and overall costs of alternatives when making key decisions. 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 (European Commission 2008 (a)). Member States can use several economic methods and tools in their implementation of the directive. Key tools include the following: estimating costs and benefits, cost-effectiveness analysis, cost-benefit analysis. Because of the high cost of the investments needed, especially in the 12 new Member States, the EU is supporting the construction of drinking water facilities, wastewater treatment plants and sewerage networks through its Structural and Cohesion Funds. Between 2007 and 2013 a total of about €22 billion will beavailable for such investments. Over 60% of the resources will go to new Member States and the remainder to the poorer regions in the 15 older Member States (European Commission(b)).

The Water Footprint as Indicator of Water Use. The first academic publication about the ecological footprint was by William Rees in 1992 (Rees 1992). The ecological footprint concept and calculation method was developed as the PhD dissertation of Mathis Wackernagel (1994). Furthermore, the water footprint is an indicator of water use that looks at both direct and indirect water use of a consumer or producer. The water footprint of an individual, community or business is defined as the total volume of freshwater that is used to produce the goods and services consumed by the individual or community or produced by the business (http://www.waterfootprint.org/?page=files/home). Water footprint was constructed in analogy with ecological footprint (Wackernagel & Rees 1996). Ecological footprint analysis compares human demand on nature with the biosphere's ability to regenerate resources and provide services. It does this by assessing the biologically productive land and marine area required to produce the resources a population consumes and absorb the corresponding waste, using prevailing technology.

In direct relation to water footprint is that of virtual water. The virtual water is an economic concept and represents the volume of water required to produce a product measured at the place where the product was actually produced (production site specific definition). The virtual water content of a product can also be defined as the volume of water that would have been required to produce the product in the place where the product is consumed (consumption site specific definition). It is measured in liters per measure unit (Petrescu et al 2010). The water footprint concept and the concern for reducing human impact on water led to the concept of "water neutral" activities, concept introduced by P. Ndebele at Johannesburg World Summit for Sustainable Development in 2002 (Water neutral 2002). A "water neutral" activity is one that reduces the water

footprint and compensates the environmental and social damages associated to the water use, as the water use cannot be reduced to zero like some pollutions (Hoekstra 2008). The adoption of this concept encourages the companies, institutions etc to invest in water saving technology, water conservation measures, wastewater treatment and water supply to the poor that do not have proper water supply etc.

The concept of water footprint has its limitations. For instance, its use was not always objective, because the water footprint was used to criticize certain products without discussing the results in further detail (such as that a water footprint of a product can make no harm on environment in humid areas, but it can harm in dry areas). Another critique is that the water footprint concept only includes sums of water quantities without considering related impacts (as the ecological footprint does). The minuses that this indicator has must be seen as challenges to improve it through further research and practical application. The utilization it had so far proves that the benefits brought by the creation and use of the water footprint unequivocally exceed the disadvantages resulted from its imperfection. The awareness on the significance and on the value of the water footprint of products, people, business, nations and the use of these bring several main benefits such as: offer to the water poor countries a way to use the international commerce to import water-consuming products and to export non-water-consuming products in order to save the water for other purposes; has a positive impact on environment equilibrium, in general; contribute to the improvement of the water use, towards a sustainable one (Petrescu et al 2010).

Conclusions. Protection of water resources is one of the cornerstones of environmental protection. Supplies of good quality water allocated to agriculture are expected to decrease because most of available freshwater resources have already been mobilized (Hamdy 2000), which will affect many economies. Thus, the water management plays an important role. Water resources management is about safeguarding the sustainability of a resource that has no substitute. It involves the most fundamental policy decisions: how to protect water, ensure its positive contribution to the environment and balance the demands for its different uses (O'Leary & Stalgren 2008). A large gap between water supply and demand has arisen due to population and economic growth, urbanization, changing dietary habits and the onset of climate change (O'Leary & Stalgren 2008). These are only few of the reasons that required international reglementation using legal and economic instruments. Even if, nowadays emphasis is on prevention, the legal framework represents an important base for coercitive measures, which are essential for water resources conservation. EU Member States are required to ensure that the prices charged to water consumers for services, such as for the delivery of fresh water and the collection and treatment of wastewater, reflect the full costs of extracting, treating and transporting it to consumers. The Water Framework Directive introduces economic methods for improving water quality while maintaining its focus on the broader and often intangible value of water. Its preamble states that "water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such".

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Authors:
Ruxandra Mălina Petrescu-Mag, Babeș-Bolyai University, Faculty of Environmental Sciences and Engineering, 30 Fantanele Street, Cluj-Napoca 400294, e-mail: pmalina2000@yahoo.com
Dacinia Crina Petrescu, Babeș-Bolyai University, Faculty of Business, 7 Horea Street, Cluj-Napoca 400174, crina.petrescu@tbs.ubbcluj.ro
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