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# Romania Water Diagnostic Report

JUNE 2018

Moving toward EU Compliance, Inclusion, and Water Security

## EXECUTIVE SUMMARY



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## Abbreviations

ANAR	National Administration “Romanian Waters”
ANIF	National Irrigation Agency
ANRSC	National Regulatory Agency for Communal Services
ARA	Romanian Association of Water
BWD	Bathing Water Directive
DWD	Drinking Water Directive
EC	European Commission
FMP	Flood Management Plans
FRMP	Flood Risks Management Plans
GDP	Gross domestic product
IDA	Intercommunity Development Associations
INHGA	National Institute of Hydrology and Water Management
IP	Implementation Plan
JMP	Joint Monitoring Programme
LIOP	Large Infrastructure Operational Program
MARD	Ministry of Agriculture and Rural Development
MRDPAEF	Ministry of Regional Development, Public Administration and European Funds
MWF	Ministry of Waters and Forests
NRW	Non-Revenue Water
O&M	Operation and maintenance
PSIA	Poverty and Social Impact Assessment
RBMP	River Basin Management Plans
ROC	Regional Operating Companies
SDG	Sustainable Development Goals
UWWTD	Urban Wastewater Treatment Directive
WFD	Water Framework Directive
WPP	Water Partnership Program
WSS	Water supply and sanitation services



# Executive Summary

## 1. Objective and Scope of This Report

**This report was prepared by the World Bank to support its water sector dialogue with the Government of Romania.** It aims to provide stakeholders, especially from the Romanian Government and the European Commission (EC), with a comprehensive stock-taking of the situation in the Romanian water sector in 2017, 10 years after the country joined the EU. The report documents the current situation, discusses the main lessons learned from reforms in water resources management, water supply sanitation and irrigation, and identifies the key water challenges faced by Romania. While not pretending to cover all possible water-related issues (due *inter alia* to limited access to some information), it seeks to identify the key policy issues and indicate what steps the government could consider in the near future.

**This report looks at the situation in the water sector in Romania through the lens of water security, with a focus on compliance** with EU water legislation and the **inclusion** of the poor. Water security is a broad concept that encompasses ensuring sustainable use of water resources, delivering affordable services to all, and mitigating water-related risks in a context of change—the goal being to **build a water secure future for the people, the economy and the environment in a context of global changes**. In the case of Romania, the over-arching concept of water security is closely linked to compliance and inclusion. Compliance with EU water legislation that covers large pans of sustainable water management has been a priority over the past decade, as part of the harmonization with the EU “*Environmental Acquis*” and broader EU integration agenda. Inclusion of the poor in Romania is also a topic of singular importance to the water sector, as the country is an outlier among the EU countries for having a large population without access to piped potable water and flush toilets.

**Starting by taking stock of the situation in water management in Romania** under the two dimension of EU compliance and inclusion, 10 years after the country joined the EU, **the report then** zooms in the three sub-sectors, namely water resources management (including flood protection), water supply and sanitation services (WSS), and irrigation; a dedicated “spatial analysis” chapter reviews the situation in each of the 11 river basins. The report then **expands the analysis to embrace the broader concept of water security**, adding *inter alia* the dimensions of sustainability, long-term resilience and preparedness to those of compliance and inclusion, thus comprehensively discussing the question whether Romania is sufficiently equipped to deal with the many water challenges it faces. This discussion concludes with a list of potential areas for government interventions towards water security.

A **Snapshot of the Romanian Water Sector** following this executive summary presents key facts on the current situation in a two-page table.

## 2. Where Does Romania Stand? Taking Stock of 10 Years of EU Membership in Water Management for Compliance and Inclusion

### Compliance with the Complex Body of EU Water Legislations Is Proving Challenging and Costly

**By joining the EU in 2007, Romania undertook a legal obligation to comply with EU water legislation.** This includes a series of older directives focused on either pollution abatement (Urban Wastewater Treatment and Nitrates Directives) or monitoring (Drinking Water and Bathing Water Directives), as well as the more recent Water Framework Directive (WFD) that aims at good water status through a result-based approach at river basin level. As this complex body of legislation was largely designed before 2000 by, and for, richer countries, compliance has presented major challenges for the country with a per capita gross domestic product (GDP) well below the EU average. For almost two decades (including the pre-accession period), water reforms and financing (mostly from EU cohesion funds) have focused on EU compliance, yet it has been estimated that 29 billion<sup>1</sup> euros would still be needed to achieve it. It is therefore essential to take stock of what has been achieved, what remains to be done, and what may have been missed because of the compliance focus.

**Compliance with the Urban Wastewater Treatment Directive (UWWTD) has been by far the most difficult task—and is likely to remain such for at least another decade.** The country started from a very low base in terms of sewerage infrastructure and had negotiated the most generous interim deadlines (final compliance in 2018) amongst EU-13 countries. Yet, despite having carried out massive investments together with implementing supporting reforms, it is today the worst performer amongst EU countries for compliance with the UWWTD. Implementation of the UWWTD has been closely linked to the WSS reform and affected by the various challenges it encountered including resistance by local authorities against joining regional public utilities, resistance of households to connect to newly installed sewerage networks, slow absorption of EU funds, and the absence of a strategy for small rural agglomerations.

**A major infringement case from the EC for non-compliance with the UWWTD is now unavoidable, as the 2018 deadline (under the accession treaty) will be missed.** The deadline for compliance in agglomerations with more than 10,000 PE. was December 2015, and December 2018 is the deadline for small rural agglomerations (between 2,000 and 10,000 PE). By the end of 2016, while a large portion of the pollution load in agglomerations with more than 10,000 PE was collected and treated—84.5 percent and 78.5 percent respectively—less than 15 percent of the pollution load in rural agglomerations was collected and treated. It is clear that UWWTD compliance will take many years to be achieved and will require major efforts and actions on the part of the government.

**For other EU water directives, the compliance performance of Romania has been more consistent.** River Basin Management Plans (RBMPs) for the WFD were of good quality and submitted to the EC on time. Romania has a good performance for river quality, with 71 percent of rivers having a good or high ecological status in 2015. Romania benefits from a long tradition

of river basin management and charging for water use. Having mapped flood risks and submitted Flood Management Plans (FMPs), Romania also fully complied with the requirements of the Floods Directive. For the other directives, such as the Nitrates Directive, Bathing Water Directive (BWD), and Drinking Water Directive (DWD), a few challenges remain but there are no other impending threats of infringement.

### **Beyond Compliance: There Is a Major Inclusion Gap for the Poor**

**The current EU legislation does not address universal access to potable WSS.** While stipulating potability parameters for the households already connected to piped water systems, DWD does not require all households to be connected to piped water supply and has no reporting requirement for small scale water supply systems serving less than 50 people. It also ignores potability issues for households that have to rely on their own wells for self-supply. Similarly, the UWWTD only requires that domestic sewerage be properly collected and treated before discharge into the environment—not that all households have access to adequate in-house sanitation (flush toilets).

**There is currently a significant access gap for piped water, with about 4.5 million Romanians lacking access to piped water within their house.** In 2015, the connection rate to piped water systems stood at about 63 percent nationwide, up to 77.6 percent when piped in-house self-supply is factored in (about 2.8 million people—usually richer households—have in-house piped water from their own private well) according to the data of the latest (2016) household survey. As the connection rate increased by only 8 percentage points over the past decade, under a “business-as-usual” scenario universal access to piped water would not be achieved before 2040, at best.

**This is a major public health issue, since about half of those lacking access to piped water—close to 2.5 million people or 12 percent of the national population—are reported to be self-supplied through unsafe, non-potable water sources.** This is because many of the self-supplied households use shallow wells subject to potential fecal contaminations due to the under-development of sewerage networks and widespread lack of appropriate sanitation across the country (especially in rural agglomerations).

**There is an even higher access gap for access to flush toilets, with more than 6 million Romanians having no flush toilets in their homes.** Only 68.3 percent of the national population had access to toilets within the houses in 2016 (according to the latest household survey). The connection rate to sewage collection systems stood at 48 percent nationwide in 2015, and only a small proportion of unconnected households have in-house flush toilets with individual sanitation systems. It appears that many households are resisting connection to newly built (under the push for compliance with the UWWTD) sewerage networks, because what they want is improved in-house sanitation (upgrading from pit latrines to flush toilets), not connection to sewer networks.

**This WSS access gap is largely a legacy of Romania's past, but it makes the country a complete outlier in the EU,** where it is the only member country that does not provide an almost

universal piped water access. Romania has a worst access rate than all non-EU countries in the Danube basin except Moldova. The communist regime in Romania was quite unique amongst Eastern-bloc countries for not having ensured access to WSS services for all. As a consequence, in the early 1990s Romania had a considerable investment backlog, including both a large portion of urban areas not connected to piped WSS systems, and most of its rural towns and villages without any WSS network infrastructure. Reducing this access gap is, and for many years will be, a major challenge for the country, especially in a context of outmigration and sharp population decline in rural areas.

**The WSS access gap is also largely a poverty issue, especially in rural areas.** The gap is higher in rural areas (where poverty is concentrated), as well as marginal urban areas, and tends to be higher in regions and counties with higher poverty level. In 2015, piped water coverage in rural areas stood at only 29 percent nationwide, against 94 percent in urban areas. The much higher rates of poverty in rural areas take a special significance, since Romania has the largest proportion of rural population (46 percent) amongst EU countries. There are also discrepancies in WSS access between Roma and non-Roma, mostly in urban marginal areas (with special challenges there due to issues of land use, property titles, and the rule of law more generally).

**Because of the recent WSS tariff increases, affordability is now becoming a concern for poor families.** Large WSS tariff increases took place over the past decade, so as to ensure that sufficient funds were available to co-finance and operate the infrastructure needed for service provision and compliance—and are expected to continue. It appears that by 2016 the average WSS tariff nationwide had already reached 2.9 percent of average household's income and exceeded 5 percent of household income for poor households.

### 3. Zooming In: Water Resources Management under Risks

#### Water Resources Availability: Romania Is Almost a Water-Stressed Country

**Romania is close to being a water-stressed<sup>2</sup> country.** With a per capita annual water availability of 1,930 m<sup>3</sup> (utilizable), just above the 1,700 m<sup>3</sup> threshold for water stress, Romania is one of the most water-stressed countries in Europe on a per capita basis, which underlines the importance of sustainable water management. More than half of the utilizable freshwater resources come from the Danube, making the country highly dependent on water flowing from upstream countries. Furthermore, **there are major discrepancies in water availability between river basins.** Out of 11 river basins, five fall under the threshold for water stress, and two (*Arges-Verdea* and *Dobrogea*) are below water scarcity threshold (1,000 m<sup>3</sup>), while another one (*Buzau-Ialomita*) is close to water scarcity. The Danube river plays a key role in some rivers basins (in the southeast), but its use is restricted by both topographic conditions and international agreements.

**The overall water consumption has fallen drastically since the 1990s**—down from 20.4 (close to the current level of utilizable resources) to 6.5 BCM per year for all uses (irrigation, industry and domestic)—being by far **the largest drop in water abstraction over that period amongst**

**EU-13 countries.** This was the result of structural reforms of the past three decades, which affected all aspects of water management, though the highest drop occurred in irrigation, with an eightfold reduction.

**Until now, this drastic drop in demand has provided a buffer for water resources management giving the country—from a quantitative point of view—a false sense of water security that will be challenged by climate change.**

### Climate Change Is Expected to Have a Major Impact on Water Resources and Management in Romania

**Among the Danube basin countries, Romania is expected to be the one most affected by climate change overall.** Climate change is expected to significantly increase the frequency and magnitude of floods, including flash floods, and droughts. This will be especially the case in the southeast, which has the highest concentration of arable lands and irrigation infrastructure in the country. A semi-arid climate will gradually be established here over the next two to three decades.

**Climate change will put further strain on chronically underfunded water resources management by requiring *inter alia* major investments in dams' storage and flood protection** in order to increase storage for droughts and improve protection from flooding downstream. National Administration “Romanian Waters” (ANAR) has been suffering from a series of institutional and financial weaknesses—including insufficient revenues from bulk water tariffs—which hinder adequate maintenance of hydraulic assets. In addition, the government has not allocated sufficient funds to cope with the large investment needs.

### Romania Is One of the European Countries Most at Risk of Floods

**Floods cost on average 140 million euros per year to the Romanian economy.** The country is ranked in the EU just after Poland, the Slovak Republic and the Czech Republic in terms of floods risks. Annual floods in different parts of the country over the 2002-13 period are estimated to have incurred economic losses of more than 6.3 billion euros (with the two catastrophic floods in 2005 and 2010 causing more than a 100 deaths and total economic losses of 2.4 billion euros). The average annual cost of floods has been estimated at 150 million euros for the 2000-15 period. In seven (out of the total of 42) Romanian counties the average annual economic losses due to floods exceed 4 percent of local GDP.

**The current flood protection infrastructure in Romania suffers from maintenance backlog.** While a considerable flood protection system had been developed, it is not fully functional due to lack of resources for proper operation and maintenance (O&M) over the past two decades. ANAR, the national water agency responsible for the operational management of water resources nationwide, is affected by several institutional shortcomings, including lack of predictable funding for both O&M and investment, as well as land use issues, which all together prevent it from properly managing flood risks.

**The main requirements for flood protection investments duly identified under the Flood Directive amount to 3.7 billion euros.** However, the requirements under this Directive are limited to risk

assessment and submitting the Flood Risks Management Plans (FRMPs) to the EC—and there is no obligation to report on executing these plans and carrying out identified investments.

### Major Investments in Dams Are Needed for Safety, Storage Capacity and Retrofitting

**Many Romanian dams are structurally unsafe, and have to be operated well below their original design level to ensure safety of populations downstream.** Built between 1970 and 1990, these dams have seriously deteriorated due to lack of proper maintenance and rehabilitation. Many of these dams also do not implement proper environmental flows as required by the WFD—a situation worsened by the private development of micro hydropower plants, which were often installed in protected habitats, leading to an infringement case initiated by the EC in 2015 under the Habitat Directive.

**Major investments are needed for dam safety, to rehabilitate deteriorated dams and ensure that they can be operated safely at their original design capacity.** There are also dams whose construction was stopped in the 1990s and that remain uncompleted. Although Romania still has a large untapped potential for increasing its total water storage, rehabilitation and completion of these dams appears the least costly solution, compared to building new dams, for increasing total water storage capacity.

**Dam rehabilitation would need to be carried out in parallel with retrofitting, so as to adapt to new demands and legislation.** The demographics and economics of Romania have changed considerably since these dams were designed and built about half a century ago. The water demand patterns have shifted swiftly after the 1990s structural reforms. Climate change is also modifying the hydrological regimes. Finally, new regulatory requirements, such as compliance with environmental flows, are in place under the EU legislation. Any investment into old dams should therefore carefully review and revise their operational modes to adapt them to new multipurpose uses.

## 4. Zooming In: Water Supply and Sanitation Reforms

### Compliance Has Driven WSS Utilities Reforms, with Emphasis on Regionalization

**Commercialization and regionalization of WSS services have been the backbone of the reforms of the past decade.** Poorly performing and highly fragmented municipal operators have been replaced by 43 regional public operators and two large private operators which provide piped water service to 11 million people, or more than 70 percent of the connected population. This was achieved by putting in place a new institutional framework in which municipalities delegated WSS services to new public Regional Operating Companies (ROCs). The municipalities supervise their performance through Intercommunity Development Associations (IDAs). Tariff levels were gradually raised to now cover full O&M costs plus some capex. There is no question that a lot has been achieved in reforming WSS utilities in Romania over the past decade.

**However, the regionalization is still largely incomplete with large utilities serving only about 55 percent of the total population.** About 1.6 million people are still served by local municipal

utilities, and close to 7 million people (2015) are not connected to centralized piped water networks and rely on self-supply (typically from private wells)—with many having to fetch water from outside of the house premises. To incentivize municipalities, access to EU grant funds for capex was made conditional on joining a ROC. Yet, many municipal authorities have been resisting joining an IDA, and a significant portion of those who did so had as of 2016 not yet delegated their WSS services to a ROC. There are also cases of municipalities joining a ROC and withdrawing from it afterwards. Concerns over high tariffs and local political considerations seem to be key reasons behind the resistance to regionalization.

**Many public regional utilities created a decade ago are now achieving reasonably satisfactory performance—but there is scope for operational improvement.** Tariff levels have increased significantly, and many ROCs now fully cover their O&M costs, generate some financial surplus from cash-flow, and have been able to access commercial (non-sovereign) financing to co-finance EU grants for infrastructure investments. Yet, many still show weak operational and financial performance with high water losses (the national average level for Non-Revenue Water (NRW) stands at about 50 percent) and relatively low labor productivity. Although a national regulator has been in place for more than a decade, much remains to be done to enhance the regulatory framework with proper benchmarking and appropriate performance incentives.

**The limited progress on closing the potable water access gap, as well as on compliance with the UWWTD in small agglomerations in rural areas, can be at least partly linked to the difficulties of the regionalization process.** Paradoxically, while the rationale for the regionalization reform was to facilitate expanding access in rural areas—lowering the costs through scale economies, and addressing local capacity shortages—the current model is having the opposite effect. **The push to establish creditworthy public utilities has resulted in reducing the incentives for them to expand in poor and rural areas,** because doing so reduces their operational performance and financial viability, especially in the overall context of demographic decline and outmigration. At the current pace of growth of the coverage with piped water services, Romania would be able to achieve universal access between 2040 and 2050 only—and whether this is an acceptable deadline for an EU country is open to question.

**Regionalization and expanding access in rural areas face additional challenges** which were highlighted by a parallel household survey carried out by the WB (Danube Water Program) on the WSS access gap in rural areas in the Danube countries in 2016-17. Rural areas in Romania have a high concentration of poverty, and many rural households did not want to connect to newly installed piped water and sewerage systems mainly due to additional recurrent costs represented by a WSS bill. There is also a mismatch between the compliance requirements under the UWWTD—which is about ensuring environmentally safe disposal of domestic sewage through connection to a sewerage network (or appropriate individual sanitation)—and what many households want, namely to upgrade from pit latrines to flush toilets. The study also showed that rural customers tend to feel that they receive less customer attention from ROCs than from municipal operators.

**The regulatory methodology to ensure WSS tariffs affordability for the poor should be revised.**

Currently, the national regulator ANRSC applies a regulatory pricing rule that limits WSS tariff levels to 2.5 percent of an average household's income. This rule, although simple, is inherently flawed since it focuses on affordability for middle-income families, and does not take into consideration the income level of the poorer families. This is especially so in a country like Romania that has considerable social disparities. The reason this has not yet been a major social problem is that most of the poor do not have access to piped water (and therefore do not receive a bill), and also because tariffs in poorer rural areas served by municipal operators tend to be lower than those in areas served by the regional utilities. Nonetheless, tariff affordability is one of the key reasons why many households connect to newly installed WSS networks.

## 5. Zooming In: Water for Irrigation

### The Legacy of Large Irrigation Infrastructure Has Only Been Partly Dealt With

Romania has a major **legacy of large irrigation infrastructure built before the 1990s**. With about 3 million hectares, it possesses the largest irrigation-equipped area in Central and Eastern Europe that is concentrated in the Lower Danube in the southeast of the country. Several decades ago, it used to be ranked third amongst all European countries—just behind Spain and Italy—for its irrigated surface. Irrigation has always played an important role in Romanian agriculture due to the significant year-to-year rainfall variability, as well as the wide disparity in water endowment between river basins. However, most of this infrastructure has been largely abandoned following the market-oriented reforms implemented over the past two decades, and only less than 10 percent of the previously equipped irrigation area is being used by farmers.

**The economics of irrigated agriculture changed drastically after Romania switched to a market economy.** The dismantlement of large state farms resulted in a myriad of small privately-owned farms, with many of the new farmers having little financial and technical capacity and focusing on subsistence farming. The subsequent **move to full cost recovery for irrigation tariffs** proved successful in some areas, but also left many irrigation perimeters being virtually abandoned, with no demand from farmers as many perimeters relied on extensive pumping to convey water to higher elevations. As a consequence, the national irrigation agency (ANIF) is now concentrating on a limited number of irrigation schemes for which revenues could cover O&M costs—with the rest of the irrigation infrastructure being abandoned and deteriorating.

While **there is no exit strategy for the many irrigation perimeters that are deemed economically non-viable**, there is also a **large number of economically viable perimeters that are under-utilized** because they have been in need of major rehabilitation for many years. At least **about a third of the existing irrigation perimeters are economically viable** (or could become economically viable with proper support given to farmers). This represents a **major loss in economic development potential for poor rural areas**. Climate change is also expected to

increase the need for irrigation in some parts of the country, especially in the lower Danube, further justifying the rehabilitation of some perimeters.

**Overall, it has been estimated that as many as 820,000 hectares were economically viable, and in need of major rehabilitation, for a total investment cost of about 1 billion euros.** This 2013 figure was revised in 2016 by MARD to 1.9 million hectares with the same budget, thus raising questions about appropriate costing and the need for better prioritization. No exit strategy has yet been outlined for the many irrigation perimeters that are considered economically nonviable. As Romanian agriculture seeks to move towards higher value crops, and climate change impacts strengthen, improved access to reliable irrigation services may become important again.

## 6. Looking Forward: Is Romania Ready for the Water Challenges Ahead?

### Romania Is Facing Many Challenges to Achieve Compliance, Inclusion and Water Security

Although challenges for compliance, inclusion and water security are prevalent all across Romania, **there are several hotspots where the challenges are particularly acute: in the lower Danube, in the river basins of Arges-Vedea and Buzau-Ialomita, and the north of the Prut-Barlad basin** (border with Moldova). They combine high poverty, high proportion of rural population, low WSS access rate, low compliance with the UWWTD, high climate change impact, high drought risk, high flood risk, and overall water scarcity. Other localized hotspots exist in the *Somes-Tisa*, *Siret* and *Banat* basins.

**Money is a major constraint** for a country like Romania: **the overall financial gap for compliance, inclusion and water security is huge, but not known.** The remaining cost of overall compliance with EU water legislation has been estimated at 29 billion euros in the second RBMPs (submitted in 2016). The overall investment required to achieve inclusion and water security (dams, floods, irrigation, climate change) is not known, but totals many billions of euros. For investments already identified (WSS, floods), the allocated EU grant funds up to 2020 fall well below the needs. Only about 6 billion euros has been allocated for WSS investments (Large Infrastructure Operational Program [LIOP] and National Program for Local Development [PNDL]), and 246 million euros for flood protection (LIOP).

**The second major constraint is widespread institutional weaknesses that still affect many Romanian water players.** Despite the considerable capacity building efforts that have taken place over the past two decades as part of the sector reforms to catch up with more advanced EU countries, much remains to be done. This is reflected in the slow rate of absorption of EU funds, slow decision-making processes at the political level, and slow preparation and execution of investment projects. This is also reflected in the performance gap that still exists between Romanian WSS utilities and those in more advanced countries.

**Transversal economic and demographic challenges constitute the third major constraint to the development of the Romanian water sector.** The demographic decline and outmigration phenomenon in rural areas makes it difficult to carry out efficient planning for centralized water

supply and sewerage systems beyond the short term. The widespread presence of urban slums, in almost all urban agglomerations across the country is a major hindrance to achieving universal WSS access and UWWTD compliance in urban areas.

Despite all these challenges, Romania has no choice but to move towards compliance, inclusion and water security—because **the cost of inaction would be considerable**. This would include not only major financial penalties for non-compliance with the UWWTD but also lost economic development and job creation opportunities in poor rural areas following rehabilitation of viable irrigation perimeters, the impact which poor WSS services has on rural out-migration, continuing high economic losses due to floods, and deterioration of assets (dams, irrigation), which will be key to handling the impact of climate change. There is already an increase in the number and magnitude of floods and droughts, and water stress and scarcity are beginning to be felt in some parts of the country.

### **There Is a Lack of Vision on How to Pursue WSS Reforms and Ensure UWWTD Compliance**

**There is currently no strategy on how to close the WSS financial gap (both for capex and opex), which in turn makes the dual goal of achieving compliance and inclusion elusive.** This is especially worrisome as the Romanian WSS sector remains heavily dependent on EU grant funding, despite significant tariff increases that took place in recent years. Cohesion funds are expected to be reduced after 2020, while massive investments (water for inclusion and sewerage for compliance) are still needed for at least a decade. There are no plans for dealing with a future shortage of EU funds for WSS services.

**The current WSS services delivery model ought to be revisited so as to improve inclusion, while at the same time safeguarding the valuable achievements in commercialization of public utilities.** The lack of incentives for regional operators to expand into poor areas must be addressed, possibly by combining commercial financing with budget transfers to compensate for the financial shortfalls, so that expansion does not affect the creditworthiness of utilities. At the same time, the regulator should put more emphasis on pushing utilities to improve their efficiency, so as to reduce the need for future tariff increases.

**Closing the piped water access gap should become a matter of national priority for Romania—**both because this is a serious public health issue, and because it reflects poorly on the good standing of Romania as an EU country (the current access rate is lower than in many developing countries of Latin America and North Africa). It is also a crucial issue of inclusion, as the most affected by far are poor families and lagging regions. Furthermore, the new revision of the DWD may introduce obligations for member states on universal access—and transform the piped water access gap into a compliance issue.

**Compliance with the UWWTD will be extremely challenging and is likely to take at least another decade.** While Romania has proposed to the EC a revised deadline for final compliance in 2027—nine years after the legal deadline—this is still ambitious and would require major efforts and political commitments. There is currently no strategy for compliance in

smaller agglomerations (below 10,000 PE) in which the sewerage infrastructure is mostly undeveloped and which pose special challenges (total pollution load of 5.1 million PE). As for large agglomerations (total pollution load of 14.8 million PE), even though the overall development of sewerage infrastructure appears broadly on track, the resistance of many households to connect to newly installed sewerage networks, as well as the specific challenges of urban marginalized neighborhoods, may jeopardize achieving legal compliance in large urban areas over the next five years.

**The fact that achieving WSS compliance and inclusion go hand-in-hand should be acknowledged: providing access to piped water is an integral part of the UWWTD compliance effort in rural areas.** It does not make sense to connect households to sewerage networks without connecting them to piped water. WSS tariff levels are a major cause of resistance to connecting for households and to joining regional utilities for mayors. This affects both compliance and inclusion—and the resistance will continue until a social WSS tariff targeted at poor families has been put in place. Another impediment to achieving WSS compliance and inclusion is the delicate issue of urban marginalized areas (slums), where promoting access to WSS services must be carried out in parallel with urban revitalization programs. To deal with these challenges—which are unique among EU-13 countries—applying the lessons learned from other countries, such as Portugal for UWWTD compliance and closing the piped water access gap, and Brazil or Colombia for dealing with WSS access in urban slums through revitalization programs, would be beneficial.

Also, as it is unlikely that universal piped water access could be achieved over the next decade, **Romania needs to define a strategy to ensure access to safe potable water for those households that will still rely on self-supply from private wells in the medium term.** Romania is not on track for complying with Target Six under the Sustainable Development Goals (SDGs), which requires that access to both safe and affordable drinking water and adequate sanitation for all be achieved by 2030. Currently **about 12 percent of the population are reported to rely on unsafe and non-potable water sources** (JMP<sup>3</sup>). Even though fecal contamination of shallow wells is expected to fall once UWWTD compliance is achieved, this will not be sufficient. A dedicated strategy is needed on how to ensure safe drinking water for those households in rural areas which, for many years to come, will still not be served by the large WSS utilities.

Finally, **the current WSS tariff levels and structure raise serious equity issues. The introduction of a social water tariff targeted at the poor** is becoming urgent, as poor families served by regional public utilities are likely to already be paying more than 5 percent of their disposable income for WSS services. The experience of other EU countries that have introduced such social water tariffs in recent years—Belgium (Flanders), Spain, Portugal, Italy, England, Malta, France and Greece—could be of much value. **Cancellation of the VAT rebate for piped water** (9 instead of the standard 19 percent) should be considered, since this subsidy essentially benefits the rich and the middle class, and fails to reach the majority of the poor families (with only 63 percent of the population connected to piped water networks).

The corresponding proceeds could then be directed towards financing the proposed social water tariff for the poor.

### **The Management of Hydraulic Assets—Dams, Floods Infrastructure, and Irrigation—Needs Rethinking**

As already mentioned, **Romania is expected to be seriously affected by climate change, which will increase water resources risks due to more floods and droughts.** This means that Romania will need to: (a) invest even more in flood protection starting with what is currently identified under the FRMPs, (b) increase its total dam storage capacity to mitigate the impact of both floods and droughts, and (c) rethink the need for irrigation services in the most affected areas. The challenges raised by these major endeavors provide a unique opportunity for the country to rethink how it manages its large water resources infrastructure.

Given the high flood risks and high level of average economic losses, **implementing the 3.7 billion euros of flood management investments under the FRMPs should be viewed as a “no-regret” investment**—even though this is not a legal obligation under the Floods Directive. However, since less than 10 percent of this amount has been earmarked for funding by EU grants until 2020, additional sources of funding must be identified.

**ANAR, the operational arm of water management in Romania, requires strengthening and modernization to enable sustainable management of water resources and infrastructure.** Bulk water tariffs have not been adjusted since 2010: they are too low to cover the full costs of O&M, and well below those in other EU countries (except Bulgaria). Long term asset management and prioritization is made difficult by the uncertainties of the annual budget process. Institutional shortcomings, such as land uses and institutional coordination for floods protection, should also be addressed.

**While rehabilitation or completion of many existing dams** should be the lowest cost option for increasing the overall water storage capacity, the total cost of such an investment is unknown and there is no timetable for implementation. These investments should be considered in parallel with **opportunities to re-operationalize** (retrofit) these old dams to new multi-purpose uses, beyond their original design, so as to adjust to new needs. This should include adapting to new demand patterns, new hydrological regimes (with climate change) and new regulatory requirements (environmental flows). Unless retrofitting is made an integral part of these rehabilitation works, there are risks that valuable opportunities to further leverage economic development and water security could be lost.

While Romania has the largest installed irrigation infrastructure of all Central and Eastern European countries, **there is a lack of strategic vision for irrigation at the national level.** Such irrigation strategy should address the key role of irrigation for fostering high value crops, especially in a context of climate change with increasing drought risks and the establishment of a semi-arid climate in the arable lands of the lower Danube. It should combine rehabilitation of the most viable existing perimeters with the promotion of irrigation efficient technologies at farmers’ level, with an exit strategy for the many non-viable irrigation perimeters.

## There Exist Several Untapped Opportunities for Enhancing the Development of the Water Sector

**Water tourism could offer a valuable opportunity to benefit from the good ecological status of many Romanian rivers—especially the pristine rivers of Transylvania**—by promoting sustainable development projects in remote poor rural areas. Other Central European countries, such as Slovenia and Croatia, have successfully developed fishing tourism with sustainable fisheries management on their most beautiful mountain rivers. This would be an attractive way to monetize the good ecological status of Romanian rivers (WFD) for the benefit of local populations. Tourism in the Danube Delta is also an important local economic activity, which would benefit from any improvement in the overall water quality of the Danube.

**A significant portion of the hydropower potential of Romania is still untapped.** Currently, between 25 and 30 percent of the country’s power generation comes from hydropower. Yet, the total installed capacity (6,400 MW) has been reported to represent only 18 percent of the total (theoretical) hydropower potential. However, further development would have to be aligned with the requirements of the WFD regarding hydro-morphological alterations of surface water bodies, as well as the Habitat Directive. It would require that Romania *inter alia* improves its framework for **implementing environmental flows** so that hydropower can be further developed in an environmentally sustainable manner.

**Despite all the difficulties and efforts required, EU compliance should not be viewed solely as a legal obligation—as it also brings many opportunities for the development of a greener economy.** Implementing the UWWTD should create opportunities for economic, human and environmental development, especially in poor rural areas and lagging regions. The many opportunities include the massive sewerage construction works for compliance with the UWWTD and subsequent O&M (Wastewater Treatment Plants require skilled labor), developing a local industry for sludge management of individual sanitation systems, biogas generation and wastewater reuse in agriculture. Finally, **the job creation potential due to the huge civil works backlog for water management infrastructure is considerable**—with billions of euros that will need to be invested over the next two decades. This includes large scale rehabilitation of water distribution networks for leakage reduction, and massive construction and rehabilitation work for irrigation perimeters, floods protection and dams.

## 7. What to Do Next

### Prioritization Is Needed to Deal with Financial and Institutional Gaps

Because of the magnitude of the tasks at hand, **it is crucial for the Romanian Government to engage in a prioritization exercise for investments** across all the spectrum of water management. It would be unrealistic to expect that Romania would be able to fund such a huge investment backlog over the next decade, especially in the context of potentially declining EU cohesion funds. It would be equally unrealistic to expect that such massive investments could be properly executed in less than a decade, even if the required funds were available. Capex prioritization should be based on a sound cost-benefit analysis (considering the triple

goals of compliance, inclusion and water security) and take a realistic view of the implementation capacity of both public executing agencies and the Romanian construction industry—so as to ensure proper absorption of capex funding and avoid losing scarce EU grants.

In parallel with this prioritization exercise, **wide-ranging actions should be taken to gradually close existing financial and institutional gaps**. The modernization of the financial framework in the sub-sectors of water management should continue, the system has to move towards O&M and investment costs recovery through tariffs and applying the “polluter pays principle”; and in order for Romania to benefit from past experiences and lessons learned in other EU countries, peer-to-peer exchanges on specific priority topics should be encouraged.

It must be fully recognized that prioritizing in the face of the manifold challenges facing the Romanian water sector is a difficult exercise. It shall certainly involve difficult political decisions and trade-offs. While making these decisions is strictly the remit of the Romanian Government, this report suggests to focus on **four thematic priorities to accelerate Romania’s pace towards compliance, inclusion and water security**: (1) **achieve UWWTD compliance by 2027**, (2) **revisit the WSS reform** to ensure sustainable services for all, (3) **rethink the management of hydraulic assets** (dams, flood protection, irrigation) to adapt them to changing demand and needs, and (4) better use the leverage of the water sector for **green growth**.

A **series of 16 practical actions** for the short term identified within these four thematic priorities are hereby submitted for the consideration by the Romanian Government. The following table ES.1 summarizes proposed actions and identifies the main institutional player(s) that would be in charge of direct implementation.

**TABLE ES.1. Thematic Priorities and Practical Actions**

Thematic priority 1: Achieve UWWTD compliance by 2027	
MWF	1. Updated Implementation Plan (IP) based on field inventory;
MWF (with MRDPAEF)	2. Database for reporting progress to the EC every 6 months;
	3. Strategy for UWWTD compliance in rural agglomerations;
Thematic Priority 2: Revisit WSS reform to ensure sustainable access for all	
MRDPAEF	4. Review feasibility of WSS social tariff (with PSIA study);
MRDPAEF & MOF	5. Launch a national program for commercial NRW reduction;
MWF & MoH	6. Develop a new national WSS utilities strategy involving all actors;
	7. Consider dropping the VAT rebate for potable water and re-allocating proceeds for funding capex based on social-equity goals (territorial solidarity) or financing a new social water tariff for the poor;
	8. Develop a framework for ensuring monitoring and access to safe drinking water for self-supplied households in rural areas;

*table continues next page*

**TABLE ES.1. continued**

Thematic Priority 3: Ensure sustainable management of hydraulic assets under changing conditions	
MWF and ANAR	9. Institutional and financial diagnostic of ANAR;
MARD	10. Introduction of a new floods protection charge to accelerate the implementation of flood protection investments under the FRMPs;
	11. Inventory of dams in need of rehabilitation and retrofitting;
	12. Prepare a pilot integrated water security program in one water security hotspot (at basin or county level);
	13. Prioritization of irrigation perimeters rehabilitation investments;
Thematic priority 4: Leverage water sector development for green growth	
MWF and MARD	14. Pilot for wastewater reuse in one water scarce area;
MWF	15. Local development pilot on river water tourism (no-kill fishing zone);
ANAR & Hidroelectrica	16. Develop an enhanced framework for environmental flows.

Source: World Bank elaboration.

Note: ANAR = National Administration "Romanian Waters"; EC = European Commission; FRMP = Flood Risk Management Plans; IP = Implementation Plan; MARD = Ministry of Agriculture and Rural Development; MOF = Ministry of Finance; MRDPAEF = Ministry of Regional Development and European Funds; MWF = Ministry of Waters and Forests; NRW = Non-Revenue Water; PSIA = Poverty and Social Impact Assessment; UWWTD = Urban Waste Water Treatment Directive; VAT = Value-added Tax; WSS = Water Supply and Sanitation.

### BOX ES.1. Snapshot of the Romanian Water Sector

#### General data and key players

Permanent population: **19.9 million—46 percent rural** (highest rate amongst EU countries).

Romania is almost entirely located in the **Danube river basin**, and covers 29 percent of its area.

**Ministry of Water and Forestry (MWF)** is the lead policy maker.

**National water agency ANAR** with about 9,500 staff and the annual turnover of 265 million euros manages water resources infrastructure nationwide.

**Ministry of Regional Development, Public Administration and European Funds (MRDPAEF)** leads WSS policies by administering corresponding EU cohesion funds (LIOP).

**Local administrations** are responsible for WSS services, with provision either delegated to regional public operators Regional Operating Companies [ROCs] and private operators, or through municipal departments (some corporatized).

**ANRSC** is the national WSS services regulator.

**Ministry of Agriculture** is in charge of irrigation, with national irrigation agency **ANIF** in charge of operation of public irrigation perimeters.

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### BOX ES.1. continued

#### Summary investment data (best estimates)

Capex still needed for **EU water legislation compliance: 29 billion euros** (based on 2<sup>nd</sup> River Basin Management Plans [RBMPs])

Capex for **closing the piped water access gap: 6 billion euros**

Capex for **flood risk protection: 3.6 billion euros** (FRMPs)

Capex for rehabilitation of **viable irrigation perimeters: more than 1 billion euros**

Capex for **dam rehabilitation and retrofitting**: not yet known

**Only about 6.25 billion euros funded so far** through EU grant funds until 2020

#### Water Resources

78,905 km of rivers, with the lower Danube marking the southern border with Bulgaria

**11 river basins**: Crisuri, Banat, Somes-Tisa, Mures, Jiu, Olt, Arges-Vedea, Siret, Buzau-Ialomita, Prut-Barlad and Dobrogea

**Utilizable water resources: 38.4 billion m<sup>3</sup>/year of which more than half comes from the Danube** (20 billion m<sup>3</sup>/year)—out of a total of 135 billion m<sup>3</sup>/year of potential water resources

**Freshwater availability: 1,930 m<sup>3</sup> per capita—close to water stress** (threshold 1,700 m<sup>3</sup>/cap)

**High variability** in water resources availability between river basins (5 river basins under water stress) and between years (from about 22 to 64 billion m<sup>3</sup> usable water)

**Drastic fall in water demand/abstraction after the 1990s**, from 20.4 to 6.5 billion m<sup>3</sup>/year

Romania is **among the best performers on the Water Framework Directive (WFD) among the EU countries**:

- 66 percent of surface water bodies with good or high ecological status (but wide discrepancies between basins) against EU goal of 60 percent, and 90 percent of groundwater with good chemical status
- but poor condition of lakes and coastal waters (Danube delta is affected by upstream countries).

Romania is **amongst the EU countries most at risk of floods** (with Poland and the Czech republic)

**Economic cost of floods represents about 150 million euros per year** (average 2000-16)

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### BOX ES.1. continued

246 large dams (half for hydropower), **many of which have to be operated below their original design level to ensure safety**, are in need of major rehabilitation work, along with retrofitting to adjust to changing demand and climate conditions, and new regulations (environmental flows)

#### Water Supply and Sanitation

**Only 12.6 million people connected** to centralized (piped) WSS services (2015)

Most of them (9 million) are supplied by **43 regional public utilities (ROC)**, the rest supplied by private operators (2.1 million, including Bucharest) and about 900 local public operators (1.5 million)

**Connection rate to piped potable water networks: 64 percent (only 29 percent in rural areas, 2015)**

**Rate of access to piped potable water: 77.6 percent** (including piped self-supply, 2016) **4.5 million Romanians do not have access to piped potable water**, mostly in rural areas affected by outmigration, and about **half of these are relying on unsafe water sources** (12% pop.)

**Connection rate to sewerage networks: 48 percent** (2015)

**Only 68.3 percent of the population has access to toilets in house. More than 6 million Romanian do not have access to flush toilets**—mostly in rural areas (2016)

**The WSS access gap makes Romania a complete outlier amongst EU countries** and behind Serbia and Ukraine—raising **serious issues of inclusion for the poor** (rural areas and marginal groups)

Romania is **the worst performer amongst EU countries for UWWTD compliance**. The distance to compliance in December 2016 stood at:

- Article 3 (collection): 85 percent in large aggro. but only 17 percent in aggro. C (2,000–10,000 PE)
- Article 4 (treatment): 79 percent in large aggro. but only 15 percent in aggro. C
- Article 5 (more stringent treatment): only 45 percent of total load treated at tertiary level.

**Average WSS tariff** for domestic (ROCs): about 6 RON/m<sup>3</sup> or **1.3 euros/m<sup>3</sup>** (without VAT, 2017)

Significant tariff increases in recent years leading to **growing concern about affordability for the poor** (average WSS bill for ROCs standing at 2.9 percent of average households' income in 2015)

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### BOX ES.1. continued

Performance of ROCs: metering 94 percent, NRW 50 percent, 6.5 staff per 1,000 connections (2016)

Many ROCs are generating an operating cash-flow surplus and are creditworthy, with a total of about **410 million euros in non-sovereign commercial debts** outstanding (37 loans, 24 with EBRD)

#### Irrigation

Romania has the largest irrigated area of all Central and Eastern European countries, with about **3 million hectares equipped with irrigation** (built before the 1990s)

Major structural reforms over the past two decades have led to extreme fragmentation of farms (45 percent of all EU farms are in Romania), a move towards full cost recovery tariffs (O&M), and a drastic **fall in irrigation demand** (volume of irrigation water has fallen eight fold since 1990)

Currently **less than 10 percent of the equipped irrigated area is being used** (mostly in Braila and Galati counties), while the rest of the irrigation infrastructure is abandoned and deteriorating

**About a third of the total equipped irrigated area is deemed economically viable, and in need of rehabilitation**—significant economic development opportunities are being lost in rural areas

For the other, non-viable, perimeters (high pumping cost, no demand) an **exit strategy** is needed

#### Water Security—Hotspots

**Romania will be seriously affected by climate change**, with increased magnitude and frequency of droughts and floods, and the establishment of a **semi-arid climate in the southeast**

A specific analysis of water security in this study combined the dimensions of poverty, WSS access, EU compliance, water scarcity, flood and drought risks, and climate change impact

**3 hotspot river basins** for water security: **Prut-Barlada, Arges-Vedea and Buzau-Ialomita**

**Main hotspots for water security at counties level** are all those **along the lower Danube—Dolj, Olt, Teleorman, Giurgiu, Ilfov and Calarasi**—as well as the counties of **Botosani, Vaslui and Susleava in the northeast** (borders with Ukraine and Moldova).

## Notes

1. A billion is 1,000 million.
2. The indicator of water scarcity was developed by Malin Falkenmark and presented in his paper: Malin Falkenmark (1989) “The massive water scarcity now threatening Africa; why isn’t it being addressed?,” *Ambio*, pag. 112-18. Another paper that presents the water scarcity indicator in detail is National Technical University of Athens (2004), “Indicators and Indices for decision making in water resources management” *Water Strategy Management Newsletter*, Issue 4, 2004.
3. WHO/UNICEF Joint Monitoring Programme for Water Supply|| Sanitation and Hygiene (JMP).



