

Peer Review Report: Tiber River Basin Authority, Italy

PR reference:

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Reviewed Competent Authority (RCA)	Tiber River Basin Authority, Italy
Reviewed Competent Authority responsible for the Peer review	Giorgio CESARI (segreteria@abtevere.it)
Reviewing experts	Åse Mari Eliasson, South Baltic Water District Authority, Sweden. (ase.eliasson@lansstyrelsen.se) Ville Keskiarja, Ministry of Agriculture and Forestry, Finland. (Ville.Keskiarja@mmm.fi)

1. Background information and peer review overall objectives

1. Relations pressures-impacts-measures-objectives: methodology model implementation over Central Apennines District and reliability assessment
2. Water information System: interoperability among regional data base and national statistic system
3. Integration of policies: water management, flood protection and climate change adaptation

2. Expected results

Expected results	Estimated nr of reviewing experts – days necessary	Field of competencies concerned for the expert
Identification of the elements necessary to establish European guidelines: standards definition of statistical model over the District (RBMP). Statistical model is related to the physical characteristics of territory (hydrological and geological structure) and its outputs are further developed at regional level (Water Regional Protection Plans) by means of physically based model.	Two expert men – 3 days	Statistical inference and environmental engineering Environmental engineering experienced in management of wastewater treatment plants
Implementation of the District information structure for adaptation to the European statistical system: constraints and flexibility of the process.	1 expert man – 3 days	Information system

3. Documents available for the peer-review

List of relevant documentation and sources that has been given by the Tiber river basin authority before and/or during and after the peer review.

Name of the documents	Description / Notice
Updating of Central Apennines District Management Plan (RBMP.2) Summary for peer review meeting (2016 May 23th-27 th – Rome)	Summary of the Tiber Regional Basin Management Plan (RBMP), (in English, 3 p).
Flood risk management plan of the Central Apennines District.	Description of legal background (in English, 3 p)
ABOT- Assessment of water Balances and Optimization based Target setting across EU River Basins”, the Tiber River Basin, Moramarco 2016	Brief technical report (in English, 8 p)
Brief description of the Tevere River Basin Authority,	Brief summary note on the legal background (in English, 5 p)
Flood risk management plan of the Central Apennines District.	Brief summary note on the legal background (in English, 3 p)
Sintesi delle misure in materia di informazione e consultazione pubblica	Brief summary note on public participation (in Italian, 10 p)
Various presentations and tables showing status, objectives, exemptions and pressure impact assessment	Printed tables and charts in Italian.
Manuale d’uso del modello SIMBAT	Description of Simbat model “SIMBAT_model.doc” (in English, 44 p.)
Illustrazione del modello PARBLEU	Description of PARBLUE model (in English, 17 p.)
Applicazione della “Automated Separation Procedure” e del “Optimized process for drawing up the hydrological and water balances and for the detection of the use of water resources”	Description of model (in Italian, 52 p.)
Illustrazione della struttura del SINBAD (Global Decision Support System for the “complex system”)	Description of model (in English, 32 p.)

Websites - Online resources

Name	Description/ Notice	Address
Tevere River Basin Authority	Public consultation papers (in Italian)	www.abtevere.it/node/1198
Tevere River Basin Authority, RBMP	Adopted by the Integrated Institutional Committee in March 2016 (in Italian)	http://www.abtevere.it/node/1304

4. Other information sources used

Name of the documents	Description / Notice
The blueprint to Safeguard Europe's Water resources (COM(2012)673)	Communication from the Commission on implementation of EU water policies and integration into other policies.
Commission staff working document, COM(2012) 670 final)	Commission report on the implementation of the WFD (2006/60/EC) River Basin Management Plans.
Commission staff working document, member state: Italy. (SWD(2012) 379	Commission report on the implementation of the WFD River Basin Management Plans. in Italy
Assessment of Member States' progress in the implementation of POMs during first planning cycle (WRC, 2015)	Member State Report: Italy
Commission staff working document (SWD(2015) 51	Commission report on the progress in implementation of the Flood Directive

5. Contact details

Principal contacts for Tiber river basin authority. See Annex 1 for Program and Annex 2 For organisations and people met.

Name	Occupation	E-mail	Phone number
Giorgio Cesari	General Secretary of the Tiber River Basin	giorgio.cesari@abtevere.it	+39-0649249201/204
Remo Pelillo	Director of Studies and Documentation Office	remo.pelillo@abtevere.it	+39-0649249230
Carlo Ferranti	Director of Plans and Programs Office	carlo.ferranti@abtevere.it	+39-0649249220
Letizia Oddi	Director of legal-administrative secretary Office	letizia.oddi@abtevere.it	+39-0649249210

6. Peer Review report

Summary to be included in the overall peer review project report

Italy has a history of river basin management already before the Water Framework Directive (WFD) came into force and for example, basin authorities were created already after 1989. The Tiber River Basin Authority has made major progress in the implementation of the Water Framework Directive, from earlier water protection plans through first cycle of the Water Framework Directive that focused mainly on waste water treatment plans to this cycle which has a comprehensive River Basin Management Plan (RBMP) in place. The Tiber River Basin Authority has applied with the Water Framework Directive requirements applying hands on solution on for example pressures-impacts-analysis as well as the consideration of climate change impacts. They have utilised available data, information systems, models and studies and applied them in river basin management planning. They have carried out a wide public participative process which is an ongoing activity.

A good example of the activities of the Tiber River Basin Authority and other parties involved is multi-beneficial physical measures taken such as the creation of overflow areas and buffer for flood events having positive impacts on also river restoration, flood water retention and restoration of wetland etc. Another good example is the coordinated planning of the Flood Directive and the Water Framework Directive allowing for a joint catchment level approach, land use planning and measures for natural river restoration. In addition, a requisite for being eligible for subsidies for agricultural investments (irrigation) is that a river basin management plan is in place and followed and abstraction volumes are measured. This legislative and financial incentive, also originating from the EU regulations, is an important measure for achieving the objectives of the Water Framework Directive, but may hit hard on the regions from the socio-economic point of view where larger needs exist but proper plans or metering does not.

A lot of progress has been made, but there is still a need for an improved collaboration between different sectors and between different authorities as well as a closer collaboration between regions and nationally. In particular, where there are conflicting interests of water uses, ex in the areas of hydropower, agriculture and ecosystem services. Or where there are different capabilities, capacities or motivation to work in a harmonised way to meet the objectives of the Water Framework Directive and the Flood Directive. Because of the characteristics of sewage and waste water treatment system overflows, leakages and interruptions may occur and there is a need for continuous improvements, long term planning and investments in order to mitigate health risks and pressures to the receiving water bodies. The Land reclamation authorities “Consortium di Bonifica” have shown to be an important actor for enhancing the implementation Water Framework Directive and Flood Directive measures in agricultural areas.

Civil protection has been of highest priority already several decades in Italy and a complete and well-working flood risk management process was already in place before the Flood Directive came into a force. The Flood Directive has helped in putting relevant issues together, coordination between authorities and having a more holistic approach to flood risk management. Compared to the Water Framework Directive, the Flood Directive has been more straightforward to implement with clearer benefits and with less questionable content/set up. Climate change and other developments, however, require that there is a constant need to

put emphasis on flood risk management in order to safeguard people and mitigate economical losses; which seems also to have already been taken very well on board.

Essential for making plans into practice is a continuous and granted structure for legal measures, responsibilities, institutional collaboration and funds etc. Currently, major and continuous changes either from the EU or from the Government have hampered the work. For example, the change in the responsible area for the Tiber River Basin Authority (from basin to district basin expansion doubling the area and involving additional autonomous sub-basins) is one of the main challenges in sound implementation of Water Framework Directive and achieving its objectives. In addition, the Tiber River Basin Authority has also faced the challenge that the Water Framework Directive, being “a general but binding target programme”, does not take into account environmental, economic and social complexity and uncertainty.

More homogenous and transparent implementation of the Water Framework Directive in Italy could also benefit from putting more emphasis on national collaboration between the river basins, learning and sharing in-between river basin authorities, and a having more coherent approach for classification and organisation of information.

Purpose of the overall peer review in EU

The objective is to set up a simple, voluntary and targeted system to allow mutual learning between peers about Water framework Directive implementation and participative river basin management planning.

Description of the Tiber River Basin peer review

The overall objective for the Tiber River Basin peer review was rather broad, covering issues such as the implementation of the Water Framework Directive and the Flood Directive, related information systems and integration of policies. These topics were addressed mainly in form of presentations, interviews and visits during the mission, which was arranged in very thoughtful and friendly manner. The reviewers had a great opportunity to meet and discuss with the main collaborators from National decision making level to local actors (see program and people met in Annex 1 and 2). In addition, documents and other sources of information (see Chapter 3 and 4) were kindly provided by the Tiber River Basin Authority.

This report summarises discussions and findings from the mission and put forwards recommendations as fruits for thoughts for coming planning circles. The most of the content is based on presentations and interviews as documents available in English were rather limited. Therefore, this report is also organised according to the mission program instead of the objectives set out under Chapter 1 and 2 above. Because of the wide range of subjects covered and limited time available, it has not been possible to go in detail in this report.

Description of the Tiber River Basin

The Tiber River Basin (17,500 km²) is located in the Central Italy and begins at the Apennine Mountains and runs through the City of Rome. It consist of six regions - Umbria, Lazio, Emilia-Romagna, Tuscany, Marche and Abruzzo, which have different characteristics both from environmental and management point of view and have had an influence on the implementation of the Water Framework Directive. Under development is the expansion of the Tiber River Basin Authority, which also includes a part of Molise region and covers a surface area of 35,800 km³ and 21 provinces. In accordance of Law 221/15 the Tiber River Basin Authority shall perform their functions as in the coming months on a land an area of about 40,000 km², including the northern part of Marche Region and the River Fiora basin (Tuscany and Lazio Regions).

The Tiber River Basin has almost 5 million inhabitants of which about 60 percent lives in Rome and over 80 percent of the population lives in urban areas and very small villages. When the process started with Law 221/15 will be completed, the population will reach about 9 million inhabitants. Annual precipitation on the district is about 750-850 mm and there is a high variation in hydrological regime (for example discharge in Tiber river varies from low flow of 70 m³/s to flood flow of 2,800 m³/s with return time of 200 years). Upper parts of the catchment are very prone to flood and other types of natural hazards. Drinking water supply is secured well because of steady spring water resources at the Apennines. However, water availability studies show that water scarcity may exacerbate in the future and cause imbalance between water availability and water use (irrigation, municipal/industrial, rural water supply, hydropower, environment flow etc.).

Human pressures to water resources vary from sub-basin to sub-basin. Some are more threatened by wastewater loading, some by industrial pollution, others by nutrient and

pesticides load from agriculture and irrigation and others again by physical alterations. For example, Tuscany have large areas of irrigated agriculture, Lazio and Umbria more urban settlement and small industrial areas located into urban perimeter.

Description of the Tiber River Basin organisation

The District coordinated by Tiber River Basin Authority (Central Apennines District) is in charge of coordinating both the Flood directive and the Water Framework Directive. There are eight river basin districts in Italy.

The Italian political and administrative system is organised accordingly:

- **Parliament and Government:** the Parliament makes national environmental law (in Italy one single Act which collects all the environmental laws, Legislative Act 152/2006); the Government implements the environmental policy through national guidelines and approves the management plans of European directives.
- **Department for civil protection:** national level and local levels in the territory of the regions. Responsibility for emergency and actions in real time.
- **Regions:** responsibility for general planning as well as specific planning such as water protection, landscapes, parks, energy from renewable sources and agriculture.
- **Provinces:** intermediate level between municipalities and region - responsibility for hydraulic maintenance, facility and permits for water discharges (at this time with the abolition of their institutional bodies the provinces have become peripheral regional offices).
- **Municipalities:** responsibility for urban planning and local civil protection.
- **ATO (Optimal Territorial Area):** responsibility for waste water treatment and water supply in the territory of the Province.
- **Consortium of bonifica:** responsibility for rural management of drainage/irrigation schemas and local civil protection.
- **Authority of River Basin** (now District of Central Apennines): responsibility for risk management plan (Flood Directive) and for River Basin Management Plan (WFD).
- **Institute for Environmental Protection and Research (ISPRA):** preparation of national guidelines and coordination of Regional Agencies for Environmental Protection (ARPA).
- **Integrated Technical Committee**, named in the near future, **Operating Services Conference** (Ministries, Civil Protection and Regions): technical approval of River Basin Management Plan, Risk Management Plan, District Plan and operational guidelines for the Regions.
- **Integrated Institutional Committee**, named in the near future, **Permanent Institutional Conference:** adoption of River Basin Management Plan, Risk Management Plan, District Plan and implementation monitoring of the plans programs.
- **Other national bodies** have an interest in risk management and water resource: **TERNA** manages the national electricity network and **Italian National Institute of Statistics** (ISTAT) responsible for the statistical information on water uses.

General observations

Italy has a history of river basin management before the Water Framework Directive as basin authorities were created after 1989. The Tiber River Basin Authority has made major progress in the implementation of the Water Framework Directive, from earlier water protection plans through first cycle of the Water Framework Directive that focused mainly on waste water treatment plans to this cycle which has a comprehensive River Basin Management Plan (RBMP) in place. The Tiber River Basin Authority has applied with the Water Framework Directive requirements applying hands on solution on for example pressures-impacts-analysis as well as the consideration of climate change impacts. Several studies have been carried out on for example climate change, flood protection measures, water flow. They have utilised available data, information systems, models and studies and applied them in river basin management planning. They have carried out a wide public participative process which is an ongoing activity.

A lot of emphasis has been put on flood risk management and the Flood Directive has helped in putting all relevant issues together, coordination between authorities and having a more holistic approach to flood risk management. This comprehensive work has enabled safeguarding people and decreasing economical losses due to floods. Climate change and other developments, however, require additional future work for flood prevention and protection and this work is already ongoing.

Compared to the Flood Directive, the Water Framework Directive has not been as straightforward to implement and more challenges have been faced. A lot of progress have been made, but there is still a need for an improved collaboration between different sectors and between different authorities as well as a closer collaboration between regions and nationally. In particular, where there are conflicting interests of water uses, ex in the areas of hydropower, agriculture and ecosystem services. Or where there are different capabilities, capacities or motivation to work in a harmonized way to meet the objectives.

With regards to the implementation of the Water Framework Directive the Tiber River Basin Authority has also faced the challenge that the Directive is “a general but binding target programme” by nature and that the interpretation of the requirements and implementation guidelines tend to evolve.. For example, one-out-all-out principle fits poorly into the complex nature of ecological status and how to be able to measure it. Another example is that Competent Authorities are responsible for achieving the objectives, but neither them nor a general level planning instrument such as River Basin Management Plan can solely decide over and has a power to implement the actual measures.

Strengths:

- A good example in the Tiber River Basin is that a joint catchment level planning has been able to enhance the implementation of natural or near natural measures that have multiple benefits such as flood water retention, improving water quality, maintaining and restoring biodiversity.
- Another good example is the coordinated planning of the Flood Directive and the Water framework directive has also involved relevant authorities and stakeholders, such land use managers, in to the planning process.
- Land reclamation authority “Consortium di bonifica” (economic institution organized by the rural stakeholders responsible for maintenance of public and private drainage and irrigation) has shown to be an important actor in the means of achieving physical

measures within agriculture, getting landowners approval for letting land to be flooded when needed for example.

- River contracts (contracts between river basin local authorities and landowners on water and land use) have shown to be important for safeguarding water quality and quantity in some river basins where there are several interest for water use.
- Pressures from irrigation is controlled by a new requisite for being eligible for subsidies only if a river basin management plan is in place and abstraction volumes are measured.
- Public participation is an ongoing continuous activity.

Recommendations:

- Essential for making plans into practice is a continuous and granted structure for legal measures, responsibilities and fund. Currently major changes in legal measures concerning responsibilities and the change in the responsible area of the Tiber river basin authority (district area expansion): the Tiber River Basin Authority informed on upcoming District Observatory institution for the management of water resources. Major challenges ahead involve small autonomous basins into the district.
- For a more targeted and homogenous application of the directives there are needs for more strategic and commonly agreed priorities on national level as well as operational plans “Water protection plans” for the seven Regions of district. In addition, it seems there is also some room for improvements in first, having a more transparent and frequent system for control of water utilities (constitution of the Permanent Technical Board for irrigation purposes in implementation of the Ministerial Decree of July 31, 2015); *and secondly* inclusion of the management plans measures within the “National Program of Action for the triennium” under Article 72 of Legislative Decree. n. 152/2006.
- A major challenge for the Tiber River Basin Authority is the facilitation of collaboration between regions and different areas of interest as today the institutional aspects are not requiring different authorities with agriculture and environment, for example to work together Work is carried out in a general linear way between different authorities and institutions. A closer collaboration could be facilitated by the constitution inter-institutional and inter-sectorial. Specific task-forces.
- The Tiber River Basin Authority could initiate workshops on different thematics improving collaboration in the district. Perhaps also to be more involved in EU wide development work (in particular, for example, in the look over funding European projects related to the district problems and presented by national and local subjects) and utilising earlier experiences and for example, the work done within the World Water Assessment Program (WWAP).
- Also there is a need to look over subsidies for new very small hydropower plant that they are not in conflict with the objectives of the Water Framework Directive. In addition, problems with sedimentation of reservoirs need to be tried to be solved / mitigated in order to quarantine the performance in a long run.
- Public participation has a very good base covering areas of environment, water quality to culture, but can be expanded by targeting different actors and sectors. This involve also information sharing where other means than the internet can be explored, for ex information campaigns, information material for schools or other actors. Also more information can be put on the web targeting different users and continuous news.

Basic classification, environmental objectives, model and tools linked to the Water Framework Directive

Several tools are developed and applied for the complete or parts of the Tiber River Basin District. Examples of models are:

- SIMBAT(SIMulazione BAcino Tevere, model to simulate the Tiber river basin flow regime, looking on available water resources compared to required, time-dependent and stochastic data type)
- ASP (Automated Separation Procedure): model runoff flow and base flow (applied for evaluated natural water resources, based on Manual in Report nr 50 of World Meteorological Organisation).
- PARBLEU(Pressure-impact-measures Assessment into River Basins Leading to Environmental Uses, ecological status - water quality large scale model based on Multiple Linear Regressions System).
- CEA-Mp (Cost-Effectiveness Analysis Modified procedure, model for optimal choice of measures based on efficiency indicator related to assess measures costs and expected effects and effectiveness indicator related to time period needed to achieve the “good” status).

In the Authority program there is the development of other models that integrate models to form the global Decision Support System (DSS named SINBAD – SIMulation for the BASins of District) in order to define the scenarios of flow regime, water quality and ecological quality characterized by uncertainty (in accordance with the district’s characteristic as a “complex system”) in the district where water use schemes are secured by reservoirs. This DSS will be used in the "Optimized process for drawing up the hydrological and water balances and for the detection of the use of water resources" (“Procedura ottimizzata per la redazione dei bilanci idrologici ed idrici e per l’individuazione di strategie d’uso della risorsa idrica” is a measure of RBMP”). This includes the definition of possible alternative water management strategies through the direct participation of stakeholders (in implementation of Article 14 of WFD and Article 95 of Legislative Decree no. 152/2006).

Strengths:

- There are a high number of monitoring stations in relation to water bodies on European perspective providing a sound base for characterization, measures and public acceptance. Of 493 surface water bodies 462 are monitored (228 surveillance network and 234 operational. All 158 groundwater bodies are monitored. Tiber River Basin Authority have applied the EC guidelines for the characterization, classification and setting environmental objectives and exemptions based on available financial resources in the river basins. The approach used is transparent and homogenous applied in the district, i.e. for example no evident boundaries between regions can be seen in the classification.
- Tiber River Basin Authority has applied hands on solution for pressure-impact-analysis, assessing for example pressure from population settlements and transport infrastructure on the each water body basin. The Tiber River Basin Authority is the only one that used this approach in Italy. Another positive example is their approach for assessing the pressure from dams and other barriers in relation to watercourses for the delineation of water bodies.
- The method for economic analysis used for setting objectives and exemptions is based on a straight forward approach with legal obligations. A cost-effectiveness approach has been used for selecting measures within sub-basins. Exemptions are directly linked to available

resources in the regions and have a legal obligation as there is an actor responsible for the implementation of the physical measure in the plan. The measures, included maintenance, are financed from general taxation and from a part of the Water Service payments (households, drainage network, electricity bill, permits for private use).

- There are several studies carried out in the support of the implementation of the water framework directive, there is a high level of scenario analysis, model capacity and statistical analysis both at the secretariat and within institutions, for example, Institute for Environmental Protection and Research (ISPRA), and National research Council (CNR) and national statistics (ISTAT).

Recommendations:

- Collaboration with other River basin authorities and/or institutes to develop national common approach for assessing good ecological status based on available data. Sharing methods and examples in relation to available data and type of available data will be of benefit for not only the Tiber River Basin Authority. Challenges are the large variations from river basin authorities in how far the water basin framework has been implemented.
- Collaboration with other countries/river basin authorities to see good example. Such an activity could be facilitated by the Ministry of Environment and the Institute for Environmental Protection and Research (ISPRA) which works on the European level, for example.
- A key issue is the continuity of monitoring water bodies. How to be able to assess good ecological status where measurements are scarce or missing needs to be looked into. Methods for proxy data comparing water bodies with similar characteristics can be used. For example in Sweden a way of grouping water bodies with similar characteristics has been applied which can be worth to look into mainly from the methodology point of view as the properties of the water bodies are very much different due to differences in hydrological characteristics.
- The Tiber River Basin Authority needs to consider the larger aspect of ecosystem services which are not always in line with measures and policy for flood control, water supply and hydropower plants. This is something to be looked into in the next cycle. Although many areas are fortunately with high quality and abundant quantity of water (for example the water supply of Rome) there are local quality problems and issues for efficiency to be further looked into.
- A high number of monitoring stations exists, but there seem to be a need to improve the efficiency of monitoring to be more target and risk based. For example, there is a need for monitoring of groundwater quantity, which in many river basins is unknown. There is also a need for monitoring of water abstractions for irrigation where not existing. This in order to comply with the requirements with the rural development plan in order to be eligible for subsidies in Italy.
- Sharing of data and results between different authorities is necessary for a joint common approach and for an efficient use of resources. A common data information system could also serve as a mean for improved collaboration. As a comparison Finland has a centralised national database, where all data for the water framework directive is kept. The system is only for internal use and is called Heartha. In Sweden, a centralised national system has not been possible as data is collected and modelled by different authorities. Instead a system that links/uploads data from around 30 different databases has been developed. The system is called [VISS](#) and is developed specifically for the implementation of the water framework directive. Many other actors use it as it is serving an important map and data source for different users. To keep all the major data under one

umbrella is a major challenge and needs time, maintenance and budget. For the Tiber River Basin Authority this would involve involving 30 technical and regional services on the legislative and administrative side, 4 ministries and 2 national services, but such a system could benefit many users. Starting with one area, for example water abstraction needed for irrigation could be one starting point assisting in the requirements for the Rural development subsidies.

Flood risk management

Civil protection has been of highest priority already several decades in Italy. This is due to the fact that there is a considerable high risk of natural disaster, such as landslides, floods and earthquakes, because of climate and geomorphological characteristics and the risk has also been influenced by aggressive land use planning. For example, based on assessment made in 2012 (Ance-Cresme, 2012), over 60 billion € direct damage costs have occurred and almost 6 million people involved since 1944. The most recent severe flood, causing fatalities, happened in October 2014 in Genova, where over 700 mm rainfall was experienced in two days. Tiber River Basin, predominantly the upper part of it, is one of the most flood prone areas in Italy. Pluvial and/or fluvial floods have been recorded in 2003, 2005, 2007, 2008, 2010 and 2012.

Italian National Civil Protection System renewed in late 80's and early 90's and responsible authorities include Government, National Civil Protection Department, regions, provinces and municipalities. Since the creation of River Basin Authorities, it has also been involved in the process. A comprehensive assessment of flood risks, three years planning cycle and risk zones, based on three flood scenarios (50yrs, 200yrs and 500yrs), were already in place long before the Flood Directive came into a force. That is why Italy used Flood Directive article 13 and did not make preliminary risk assessment and did not identify potential significant flood risk areas according to Flood Directive.

National guidelines for the implementation of the Flood Directive were prepared mainly by the Institute for Environmental Protection and Research (ISPRA) in cooperation with the National Civil Protection Department. The Tiber River Basin and regional authorities such as Umbria Region were involved in form of offering best practices e.g. on flood forecasting and warnings and participating in EU's reporting tests as a pilot basin. Tiber River Basin also participated in the EXCIMAP (flood mapping) and IMRA/CRUE-ERA net (participation and awareness) -projects, that are well known examples among a couple of existing flagship projects from the early days of Flood Directive.

Severe pluvial / flash floods, which are difficult to predict, occur in the Tiber River basin and make designation of significant flood risk areas problematic. That is why a vulnerability (exposed elements) based approach has been chosen. With regard to the flood risk maps and flood risk management plan, they both were prepared in time. However, especially preparation of the maps for all rivers/streams needed and engaging all relevant stakeholders and public required quite a lot of work from the authorities.

On the one hand, the implementation of the Flood Directive has caused some extra work and coordination for the authorities, but on the other hand it has helped in putting all relevant issues together and thus, having a more holistic approach to flood risk management. Challenges faced have originated for example from the fact that the coordination moved from the regions to the districts and that regions had, and have, different capacities and capabilities to contribute to flood risk management. Benefits found include that now all aspects of the

risk management, from prevention to emergency response, are better considered, more emphasis is put on prevention and water and environmental issues are better taken into account in the planning.

Flood risk management plans include measures at three levels: basin wide measures, homogenous/risk zone specific measures and significant/individual area specific measures. An example of basin wide measures is a very comprehensive and advanced set of forecasting, warning and decision support systems available for all authorities. In addition, the operation of main dams and reservoirs can be harnessed for flood protection and natural or near natural flood protection measures can be defined at the basin level.

Legislation mandates regional (emergency) committees to command hydropower operators to change discharges during the flood event. This requires that both an action plan and committee has been agreed on which is not yet the case in every river basin. In addition, there seem to be some technical and/or legal barriers that prevent operation of certain dams in the most optimal way in flood situation. However, regulation of discharges is one of the most important tools for protecting from severe fluvial floods in the river basin and thus, these barriers would be worth mitigating.

Other measures types of measures include both structural and non-structural measures such as local flood protection structures, river restorations and land use planning. There are positive examples where natural or near natural flood protection measures, e.g. flood detention reservoirs along Chiana and Tresa rivers, have been implemented with the help of regional planning and local commitment. Another example is rather large agricultural land reclamation areas that can be inundated in flood situations.

Strengths:

- Management of flood risk and other natural disasters have been given a high priority already several decades in Italy and in the Tiber River Basin. For example, legislation, administrative arrangements, planning and financing programmes for measures existed long before the Flood Directive came into a force.
- A great deal of methodological development has been made both research and operative point of view. Extensive hydrological monitoring network and advanced set of forecasting, warning and decision support systems exists and is available for regional and local authorities.
- Vulnerabilities and risk zones are mapped well and risk awareness seems to be high throughout the administration and local communities also involved. This helps in choosing and implementing the most feasible measures and preventing emergence of new risks.
- A holistic approach to flood risk management in place and relevant disciplines involved which enables for example taking into account environmental and socio-economical aspects and focus on measures delivering multiple benefits.

Recommendations:

- Continue to put emphasis on climate change studies, downscaling and to look at evolution of risks and strengthen the use of this information in flood risk management planning
- Continue methodological development related to the risk assessment and agree on national approach on the risk assessment will be done in the future in a coherent and systematic manner in every river basin districts.
- Try to harmonise capacities and capabilities of different regions in flood risk management
- Continue to work with holistic approach and strategic decision-making at river basin scale in order to be able to identify the most beneficial measures, unlock the ones not proceeding and optimise use of financing.

Water supply and waste water treatment

Italy had a major institutional reform of water services sector in 1994, and partly influenced by the Urban Waste Water Directive. Before the reform, water services were arranged in very decentralized and heterogeneous manner. For example, there were around 8000 water utilities compared to the around 100 that there currently are. Sifting from decentralised system to centralised one has helped to secure water services and also to better meet the requirements of the EU water policies. A lot of investments have been made to improve water supply and waste water treatment systems during last decades. Government has allocated a quite a lot funds (in the year 2013, 90 million euros was allocated for the coming three years) for improvements needed to meet the requirements of the Urban Waste Water Directive. Moreover, also growing in size water utilities have made a lot of investments when expanding their operation areas and modernizing treatment systems and network.

In 1994, water services were divided to be arranged at the level of ATOs (Optimal Territorial Areas). Tiber River Basins consist of 5 ATOs that all are operated by ACEA. The ACEA supplies the water and waste water services to 3,7 Million of people in Rome and its surrounding areas (inside and outside metropolitan area). Water security is quite high due to several springs (pressurized mountainous groundwater sources) around the area, especially in the Central Apennines Mountains. These springs offer a sufficient amount of high quality water for all domestic use. Each source has also been connected together in the network and in case of interruption also Lake Bracciano can be used as an emergency supply. Last major interruption was in 1991 when one of the main channels collapsed, but with the help of Lake Bracciano water services were not endangered. In addition, all areas nearby the sources have been designated as water protection zones, also the Lake Bracciano, and thus, the quality is secured, for example, from pressures that land use may cause. However, in those areas of Tiber River Basin that have not access to these abundant spring sources water shortages and related quality challenges occur.

ACEA has put a lot of emphasis on improving operational management and have introduced a very advanced and comprehensive information system that includes, among other things, a detailed description of the network and capability to respond quickly and cost-efficiently to any interruptions. This Work Force Management system has already saved operation costs, will further enhance water security and respond to the forthcoming reform that sets down a penalty fee in case of service interruption.

The biggest challenge of the water supply in Rome is to how to improve the efficiency of the system. Water supply network is old and thus leakages and interruptions occur. The sewerage system is developed through a long time, originated from natural streams and ancient Roman times channels, leading to a combined sewer system where both waste water and storm-water are conveyed. Waste water spills and overtopping occur during heavy rain events. This increases pressures to the receiving water bodies, may cause health problems and extra maintenance costs for water utilities. There is no easy solution for the problem neither from a technical nor from a financial point of view. It seems that environmental and health pressures are levelled down because downstream area and outlet points, where the biggest problems occur, are located near the sea and in the areas that are not so sensitive for this pressure. A small amount of inhabitants outside the urban areas do not have a connection to the sewerage network. However, there is an aim to have a full coverage by 2018. Another challenge is that in some sub-urban regions treatment plants and networks are very poor because of the decentralised and heterogeneous history and lack of appreciation towards water services. The situation is gradually improving along with ongoing legislative and institutional improvements and investments.

One of the main principles of the Water Framework Directive is to have a full cost recovery of the water services, taking also into account environmental costs, and to have such a water pricing system in place that gives an adequate incentive to use water efficiently. This principle has been transposed to the national legislation in Italy. In the Tiber River Basin, similarly to other parts of Italy, prices for water were among the lowest in EU (around 1,50 €/m³ for households, 0,10 - 0,20 €/m³ for irrigation). After the adoption by national Authority for Electricity Gas and Water Services - AEEGSI (December 2015) of the new tariff method for the integrated water service (municipal) water prices will also include environmental costs and resource costs. Water tariff consist of fixed fee, variable fee (taking into account consumption) and capital expenditures. Based on this, it is fair to say that the cost recovery principle and incentive to use water efficiently are incorporated into the water supply and waste water treatment services in the Central Apennines District (and in the whole Italy).

Strengths:

- Legislative and institutional reform performed and investments made that all improve the water security and achievement of Water Framework Directive objectives.
- Abundant sources of good quality water, water supply network secured and operated in a comprehensive manner in Rome and its surroundings.
- There is a sound emergency plan for the water distribution in Rome including, in near future, a new control room to tackle water scarcities across the district.

Recommendations:

- Consider shifting the focus more and more on long term planning and prevention, given e.g. that the water service system is partly very old, discharges of untreated waste water occur and climate change may exacerbate already existing water shortages in certain areas.
- Because of the characteristics of sewage and waste water treatment system, overflows, leakages and interruptions occur, and there is also a need for continuous improvements and investments in order to mitigate health risks and pressures to the receiving water bodies.

- Continue and deepen the analysis of water supply and waste water discharges from the point of view of meeting Water Framework Directive objectives and increasing resilience to climate change and other tough developments paths.

General recommendations derived from the exchange

The reviewers found the exchange very useful and interesting to see how both the Flood Directive and the Water Framework Directive has been implanted from the legislative point of view to the actual measures in place. Also it has been very useful to learn from each other i.e. between the reviewers, but also to share common difficulties in the implementation between the member states. Further exchange would be useful for looking into depth questions and practical applications but specific policy issues. More time for interviews, exchange and working time for the reviewers would have helped. Also a better online pre-meeting would have helped as the communication online were difficult.

30th June 2016

*Åse Mari Eliasson, South Baltic Water District Authority, Sweden
Ville Keskisarja, Ministry of Agriculture and Forestry, Finland*



From 23th to 27th May 2016 , will be held the meetings with European experts in charge of **PEER REVIEW Exercise, at the office of** the Tiber River Basin Authority (TRBA) (Via Monzambano, 10 Rome). The experts will receive explanations and interviews, on the activity planning set out for Directives 2000/60/EC (Water Framework Directive) and 2007/60/EC (Water Flood Directive), to be exchanged with other authorities of the European countries.

MEETING SCHEDULE Rome, 23th – 27th May 2016

MONDAY 23th MAY

14.00 – 14.20 Welcome Gaia Checcucci (General Director – Ministry of Environment – Direction of Land and Water Protection) and Giorgio Cesari (Giorgio Cesari – General Secretary TRBA)

14.20 – 14.40 Brief description of the TRBA (Letizia Oddi – Director Office Administration Legal Secretary - TRBA)

14.40 – 15.00 Flood Management Plan (Carlo Ferranti – Director Office Plans and Programs - TRBA)

15.00 – 15.20 River Basin Management Plan (Remo Pelillo – Director Office Studies and Documentation - TRBA)

15.20 – 15.40 Regional expertise in the field of flood risk and water management (water balance) (Mauro Lasagna – Director - Lazio Region, Direction Water Resources and Land Protection)

15.40 – 16.00 Regional competences in the field of water quality and sustainable development. (Vito Consoli - Director - Lazio Region, Direction Environment and Natural Resources).

16.00 – 16.30 Interview

16.30 -18.00 Time available for the meeting between the experts

TUESDAY 24th MAY

9.15 – 10.00 Welcome and departure by car to ACEA (*Multiutility firm operating in the water sector - integrated water cycle - in electricity production and distribution, in public lighting and in gas*).

10.00 – 10.30 Water Supply Scheme (Giorgio Martino – Head of Planning and Engineering Works Unit of the Central Lazio of ACEA SpA)

Key issues:

- *The needs of the Rome metropolis*
- *Flexibility and elasticity of distribution scheme*
- *The scheme as southwestern pole district of the resource supply*
- *The risk minimization*

10.30 – 11.30 Presentation of Work Force Management (Roberto Coccozza – ACEA)

Key issues:

- *The WFM as an internal organizational tool manager*
- *The WFM as a management tool of the service quality*
- *The WFM as a tool for water resource protection*
- *The WFM as set of basic data*
- *The WFM as a water scarcity management tool*

11.30 – 11.45 Break

11.45 – 12.15 Visit to Dispatch Operating Room (Marco Salis – ACEA)



12.15 – 12.45 Waste water Treatment Scheme (Roberto Celestini - ACEA)

Key issues:

- *The constraints imposed by the Rome metropolis*
- *The quality of the waters of the Tiber river in urban area*
- *Problems and scenarios of new technical wastewater treatments*

12.45 – 14.30 Light Lunch

14.30 – 15.00 ACEA ElectricPower – Le fonti di produzione e la gestione sostenibile (Mauro Orsini – ACEA)

Key issues:

- *Company and the main management*
- *The energy component in the overall water scheme*
- *Future in energy production and sustainable management*

15.00 – 15.30 Hydro-power Plants Effects On Water Bodies Quality (TRBA)

Key issues:

- *Corbara-Alviano node case study*
- *The sedimentary balance of the Corbara reservoir and Alviano lake*
- *Morphology and morphological balance of the Tiber River*
- *Sediment management scenarios*

15.30 – 15.45 Break

15.45 – 17.00 Interview

17.00 – 17.45 Return to *TRBA office*

WEDNESDAY 25th MAY

8.30 – 11.00 Departure by train (Termini Railway Station) and arrival to Chiusi - Welcome of the Consortium and World Water Assessment Programme

11.00 – 13.00 Visit of the Construction Sites

Key issues:

- *The flood control reservoir - Chiani river*
- *The flood control reservoir - Tresa river*
- *Multipurpose flood reservoirs*
- *Example of integration of the two directives*

13.00 – 14.30 Light Lunch

14.30 – 14.45 Introduction by WWAP (Michela Miletto - World Water Assessment Programme)

14.45 – 15.15 Climate Change: Project on Drought and Climate Change - SECLI project (Tommaso Moramarco – Researcher at the Research Institute for Hydrogeological Protection of the Research National Council – CNR IRPI)

- *The water balance and climate change*

15.15 – 15.45 Flood and Water Management: A Common Strategy (Angelo Viterbo – Chief Water Resources and Hydraulic Risk Service of Umbria Region)

- *Management of water resources and monitoring of extreme events: can an integrated program of interventions minimize the negative effects of water scarcity and flooding?*

15.45 – 16.30 Interview

16.30 – 19.00 Return to Rome (Termini Railway Station)



THURSDAY 26th MAY

9.00 – 9.30 Introduction of the main issues of the Plans (Remo Pelillo and Carlo Ferranti TRBA)

10.00 – 10.30 WFD Classification: Model Application Example (Remo Pelillo TRBA)

10.30 – 11.00 Decision Support System: Regional Data Ware–House Organization (Angiolo Martinelli – Director of Research and Development of Regional Environment Protection Agency - Lazio Region)

Key issues:

- *The regional information systems after the WFD and Reporting 2016*
- *Data for the Decision Support System*
- *Implementation of regional information systems for the internal (regional services) and external (between regional and national services) logical connection: constraints of directives and legal requirements*

11.00 – 11.15 Break

11.15 – 11.45 Decision Support System: Assessing water Balances and Optimization based Target setting across EU river basins - ABOT Project (Tommaso Moramarco - Researcher at the Research Institute for Hydrogeological Protection of the Research National Council – CNR IRPI) - - *Identify means and develop prevention activities to halt desertification in Europe by focusing on complementing EU water resource balances elaborated in the framework of the System of Economic and Environmental Accounts for Water (SEEA-W)*

11.45 – 12.30 Interview

12.30 – 14.00 Light Lunch

14.00 – 14.30 Production of official statistical information for Europe – A Path of Interoperability (Mauro Bencivenga - Director general of the Internal and Marine Water Department of Protection and Environmental Research Institute - ISPRA)

Key issues:

- *The role of ISPRA in information management*
- *Horizontal harmonization of regional information*
- *Hierarchization information issues*
- *Integrations for environmental information*

14.30 – 15.00 Production of official statistical information for Europe – Constraint and flexibility (Sandro Cruciani – Director general of Environmental and Territorial Statistics - ISTAT)

Key issues:

- *Socio-economics and environmental information*
- *Analysis and aggregation*
- *The customers of statistical information*
- *Integration with administrative databases*

15.00 – 15.15 Break

15.15 – 15.45 Production of statistical information for Europe: experience of Lazio Region (Francesco Mele – Director of Regional Functional Centre – Lazio Region)

Key issues:

- *Organization of the functional center of the Lazio Region*
- *The real-time activity*
- *The production of information for water balance*
- *The hydrological balance between the basin scale and regional scale*

15.45 – 16.15 Production of statistical information for Europe: experience of Umbria Region (Alfiero Moretti – Director of Regional Functional Center – Umbria Region)

Key issues:

- *Organization of the functional center of the Umbria Region*
- *The real-time activity*
- *The production of information for water balance*
- *The hydrological balance between the basin scale and regional scale*



FRIDAY 27th MAY

9.00 – 9.10 *Introduction of the issues: integration of policies and role of water services (Giorgio Cesari – TRBA)*

9.10 – 9.30 *Organizational Issues in Multipurpose Water Management (Giorgio Martino – ACEA) - The point of view of an operator of water services with respect to organization of the multi-functional water schemes*

9.30 – 9.50 *CAP (Common Agricultural Policy): Integration Towards WFD (Giuseppe Blasi – Director of European/International Strategies and Rural Development Department of Agriculture, Food and Forestry Ministry – MIPAAF) - The National Rural Development Programme in support of the Regional Rural Development Programmes for the implementation of an Italian green economy*

9.50 – 10.10 *WFD: Integration Towards CAP (Fabio Trezzini – Technical Secretary Member of Environment Ministry -MATTM) - The concept of environmental quality and quality of life in the National Strategy for Sustainable Development*

10.10 – 11.45 (or more) Time available for meeting between experts

Light lunch and arrivederci (according to the time of departure of the flight).

Annex 2. Organisation and persons meet

Organisation	Name
Tiber River Basin	<p>Georgio Cesari, General secretary, Tiber River Basin</p> <p>Carlo Ferranti, Director office plans and programs</p> <p>Paola Malvati, office plans and programs</p> <p>Letizia Oddi, Director office administration legal secretary</p> <p>Remo Pelillo, Director office studies and documentation</p> <p>Francesca Colomba, external collaborator of office studies and documentation</p> <p>Emanuele Sillato, office studies and documentation</p> <p>Leonardo Gatta, office studies and documentation</p>
The Region of Lazio	<p>Vito Consoli, Director Lazio region, Direction Environment and natural resources</p> <p>Mauro Lasagna, Director Lazio Region, Direction Water Resources and Land Protection</p>
ARPA Lazio	<p>Angiolo Martinello - Regional Environment Agency Technical Directorate Division of Research and Development</p>
The Region of Umbria	<p>Angelo Viterbo, Chief Water Resources and Hydraulic Risk Service of Umbria Region</p> <p>Alfiero Moretti, Director of Regional Functional Center</p> <p>Nicola Berni, Regional Functional Center, Foligno (PG), Umbria Region</p>
Consortium di bonifica, della Val di Chiana Romana e val di Paglia	<p>Mario Mori, President of Consortium</p> <p>Rocco Attanasio, Director of Consortium</p> <p>Rutilio Morandi, Chief of Technical Area</p>
CNR (National Research Council)	<p>Tommaso Moramaco, Researcher at the Research Institute for Hydrogeological Protection of the Research National Council – CNR IRPI</p>
ISPRA (National institute for the environment protection and reserach)	<p>Carlo Percorpo, Department of Inland and Marine Water from Protection and Environmental Research Institute</p>
ISTAT (National Statistics)	<p>Sandro Cruciani, Director general of Environmental and Territorial Statistics</p>
Ministry of Agriculture	<p>Paolo Ammassari, European/International Strategies and Rural Development Department of Agriculture, Food and Forestry Ministry (MIPAAF) in place of Giuseppe Blasi Chief of Department</p>
World Water Assessment Programme (UN)	<p>Michela Miletto, deputy coordinator of WWAP, deuputy director UNESCO programme Office on Global Water Assessment.</p>
ACEA SpA	<p>Giorgio Martini, Head of Planning and Engineering Works Unit of the Central Lazio of ACEA SpA.</p> <p>Eugenio Benedini, Planning and Engineering Works Unit of the Central Lazio</p> <p>Roberto Coccozza, Work Force Management</p> <p>Roberto Celestini, Waste Water Treatment</p> <p>Mauro Orsini, Electricity Production</p>