



# CABRI-Volga Report

## Deliverable D2

CABRI - Cooperation along a Big River:  
Institutional coordination among stakeholders  
for environmental risk management in the  
Volga Basin

**Environmental Risk Management in the Volga Basin:  
Overview of present situation and challenges in Russia and the EU**

# EXECUTIVE SUMMARY

The Executive Summary of the CABRI-Volga D2 Report “Environmental Risk Management in the Volga Basin: Overview of present situation and challenges in Russia and the EU“ presents the synthesis and major findings from analytical part of the document.

CABRI-Volga D2 Report overviews present environmental situation, problems, policies and measures within water-related environmental risk management in large river basins of Europe with a major focus on the Volga Basin in the European Russia. Inquiry into existing situation and problem-solving is performed within the thematic areas covering a number of risks within sustainable development agenda for river basins. They relate to water quality and rivers environmental rehabilitation, use of water resources, floods and transport mobility. Within these thematic areas the particular accent of the D2 Report is on registry and analysis of the existing situation and problems in institutional capacity building and in coordination between stakeholders for environmental risk reduction. Coordination and stakeholders partnerships are regarded among innovative tools in good water governance.

The D2 Executive Summary follows the structure of the D2 Report and it consists of three sections:

- I. Volga Basin: Water for sustainable development
- II. Institutional Frameworks in Practice: environmental risk reduction and sustainable development in river basins in the EU and Russia
- III. Human and Environmental Security: Vulnerability assessment and flood risk reduction in the EU and in Russia.

## I. Volga Basin: Water for Sustainable Development

### ***1. Coordination between environmental, social and economic concerns is crucial...***

The sustainable development of large river basins and integrated river basin management are closely interlinked. Within these two concepts, there is a growing understanding that the integration of *environmental, economic and social* concerns is of the utmost importance. The management of natural resources and ecosystems must be built on a multi-disciplinary approach encapsulating good coordination, cooperation and partnerships between major stakeholders based on transparency and access to information, as well as on local public participation and initiative. Although significant advances have been made in the Volga Basin during the last decade in integrating institutional coordination and multi-stakeholder partnerships into river basin management, as with other large river basins in the European Union (EU), coordination still remains a challenge.

## **2. Scientific knowledge about the Volga Basin, the largest river system in Europe is the basis for successful basin management...**

Linking *scientific knowledge* about the environment (water quality and water use), about socio-economic developments and societal vulnerabilities/risks in the Volga Basin with the *decision-making* process is necessary for successful water-related risk reduction and management. The Volga Basin is the largest river system in Europe (1,358 million sq. km) and flows for 3,530 km to the Caspian Sea. It includes a huge delta whose wetlands are considered to be the best conserved in Europe. Thirty nine members of the Russian Federation (federation subjects) are entirely or partly located in the basin. They contribute nearly half of the national industrial and agricultural output. Through its water-ways and canal systems, the Volga Route connects five European seas and regions stretching from Scandinavia to Asia. During the 14<sup>th</sup> - 16<sup>th</sup> centuries, the Volga used to be a part of the famous Hanzey Route. There are a number of areas within the Volga Basin where the environment is in crisis. Overall, however, it is still better than that of Western Europe. For example, recent monitoring results indicate that while not ideal, the water quality in the Volga is better than that of the Rhine and the Elbe (according to chemical and biological parameters).

## **3. Drinking water quality is at the top of the Volga Basin agenda...**

Within the Volga Basin, water quality, especially *drinking water*, is high on the environmental agenda. The major challenges for ensuring access to high quality water are a lack of technical facilities, inefficient purification and disinfection systems, deficiencies in municipal infrastructure for drinking water supply, poorly treated sewage, ineffective urban waste water management and leakages from water distribution networks<sup>1</sup>. As a result, only 15 percent of treated waste waters meet national standards. None of the major cities in the Volga Basin are supplied with drinking water that meets national and WHO quality standards. At the same time, ecological standards in the Volga Basin, while stricter than their international counterparts, can be difficult or unrealistic for water-users to comply with. Among other water-related concerns is inefficient water use: the level of water per capita consumption in the basin is about 1.2-1.7 times higher than in the West. The major causes of this are inadequate economic incentives to households and businesses to consume water efficiently and/or save water.

## **4. The Volga Delta is the unique site for biodiversity conservation...**

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<sup>1</sup> Water losses in distribution networks in the regions of the Volga Basin account annually for about 25% of the drinking water consumption.

Other environmental governance challenges include the protection and conservation of biodiversity in the Lower Volga and Volga Delta. Part of the Volga Delta is included into the Astrakhan Biosphere Reserve, with approximately half its estuary a Ramsar Site. The Lower Volga provides the spawning grounds for sturgeon. As a result of unsustainable human pressures in the Delta, the following problems are notable: a decline in commercial fish stocks; deterioration of environmental quality due to upstream pollution; degradation of coastal landscapes; and loss of coastal habitats.

Similar to other Volga regions, environmental stakeholder cooperation and coordination is weak with little public participation in decision-making processes. Recent surveys in the Lower Volga indicate that although a large part of the population (80 percent) is concerned with the ecological situation, only 16 percent wish to be directly involved in environmental actions. There continues to be heavy reliance on the 'paternalistic' state with environmental amelioration to be achieved mainly through strengthening governmental control and tightening ecological legislation. Less than a quarter believe that increasing local public awareness and community involvement in local management will be an effective means of environmental problem-solving. However, there are recent examples of increasing business sector involvement in environmental management, for instance the large LUKOIL energy company has established a corporate programme for marine environment monitoring at its development sites in the Northern Caspian. This includes: 1) regular data exchange with responsible government bodies; 2) supporting efforts towards increasing public ecological awareness and education in the Astrakhan oblast; 3) public hearings on the ecological impacts of marine oil and gas developments; and 4) supporting sturgeon reproduction in the Volga Delta.

##### ***5. Rehabilitation of Small Rivers is an integral part in the basin management...***

About 2600 small rivers feed into the Volga. Their rehabilitation, protection and development is also high on the environmental agenda, because under human pressure many have become degraded or have even disappeared. At the same time they are of particular importance to the Volga Basin's sustainable development, and to local livelihoods, since approximately ninety percent of the Volga's rural populations reside in their vicinity where everyday life is inspired by small river welfare. Including industrial impacts, small rivers face pressures from agriculture, non-point sources of pollution and household waste disposal. The efforts of various stakeholders need to be urgently coordinated in order to tap into the rich local knowledge so as to rehabilitate these small rivers. Awareness raising is critical and the mobilization of local capacities could be enhanced through releasing resources from the "State fund for small rivers' conservation."

**6. During the nineties the decline in water pollution was attributed to national economic crisis, while today in parallel to economic growth some pollution reduction is registered...**

According to official sources, wastewater discharges in the Volga Basin were reduced by about 29 percent during the second half of the nineties. The major reason for this was the decline in industrial production brought about by economic crisis. A comparatively modest share in the reduction of wastewater discharges has been achieved through the installation of new purification facilities and technological innovation. However, the latter's potential in the basin is enormous. According to some experts discharges may even increase with the current level of economic growth. However, the expanding economy is also expected to finance environmental clean-up. Recently, there have been promising signs for instance that in some Volga regions, economic growth has been achieved in parallel with declining levels of water pollution.

**7. Specifics in social and economic development define the context for environmental management options in the Volga...**

River basin management in general, and in particular in the Volga Basin, needs to be coordinated within a broader socio-economic, regional and national context. Existing 'situational' economic, social and political factors significantly affect river basin management turning it into a complex multidisciplinary problem. Current socio-economic situation in the Volga Basin defines trends in environmental risk reduction, in institutional coordination and in stakeholders participation in environmental problem-solving. Thus, coordination and cooperation options in water protection are rooted to a high extent in regional peculiarities and specifics of socio-economic development of the Volga regions.

**8. The level of depopulation and poverty in the Volga Basin is alarmingly high...**

It is often found that the poor state of the environment is directly linked to a deterioration in human health, social problems and a particular demographic profile. , Currently, in the Volga Basin, like in many other Russian regions, the social and demographic risks, and hence societal vulnerabilities, are high. A significant portion of the Volga Basin's population live in poverty. About 43 percent has income lower than the minimum subsistence level, and about one third of the Volga Basin's population is unemployed or is unofficially employed. Among the most alarming indicators of human insecurity is a declining population, which has been the case since the early 1990s. Current mortality rates in the Volga Basin are higher than the birth rates, while life expectancy (66 years) has also declined during the last decade<sup>2</sup>. The level of urbanization in

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<sup>2</sup> At the beginning of the 21<sup>st</sup> century Russia ranked first amongst developed countries on the mortality index and 51<sup>st</sup> in the world for average life expectancy.

the Volga Basin is quite high: about 74 percent of its total population<sup>3</sup> live in 445 cities<sup>4</sup>, or urbanized areas. Priority attention is therefore being given to the revival of small basin towns,<sup>5</sup> given their valuable traditional occupations, history, culture and local public knowledge. These settlements are expected to serve as the centers of tourism and recreation.

**9. Industrial and agricultural potential of the Volga Basin accounts for almost a half of the national total...**

The Volga Basin, while only accounting for 8 percent of Russia's territory, contributes nearly 45 percent of the total domestic industrial output, and 50 percent of its agricultural production. Gross regional product per capita exceeds the national average in Moscow, the Republic of Tatarstan, Perm, Samara, and Vologda oblasts, while the most actively developing regions during the last decade have been Moscow and Tatarstan. Export growth rates are the highest in the Moscow agglomeration, Samara and Vologda oblasts. Investment and innovation in these regions is also high, and as a result they are responsible for the highest economic growth rates in Russia<sup>6</sup> among all federation subjects. Natural resources (oil, gas, forests), electricity production, industry (automobiles, ships, aircraft, ferrous and chemicals), and agriculture contribute to the basin's high economic potential. The rapid growth of modern corporations, especially in the energy sector is among the major drivers of innovation and sustainable development in the basin. Consequently, there is an increasing diversity of actors with multiple interests towards the sustainable development agenda. Their role is expected to grow rapidly.

**10. The Volga is navigable for about half a year; it is navigable for 2.6 thousand km and has one of the largest flatland hydropower cascade in the world...**

The Volga River is part of a diversified European waterway which connects the Volga, Don and Neva and their basins, besides five seas in the north, south and west of European Russia. The cascade of artificial reservoirs and eleven hydropower stations on the Volga and its major tributary, the Kama, is one of the largest flatland hydropower cascade in the world. This system regulates water levels so as to enable navigation. About 2,600 km of the Volga is navigable and its north-south waterways intersect with the west-east road infrastructure. Needless to say, related problems in the development of this transport infrastructure impact upon regional transport mobility and the potential use of inland waterways to connect goods and people.

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<sup>3</sup> Total population in the Volga Basin is appx. 57 million.

<sup>4</sup> Seven cities in the Volga Basin have a population greater than 1 million – Moscow, Nizhny Novgorod, Samara, Perm, Kazan, Ufa and Volgograd.

<sup>5</sup> Population less than 50 thousand people

<sup>6</sup> In 2005, according to official data, the GDP growth rates in Russia accounted for 6.4 percent.

***11. The European dimension of the Volga Basin is strengthening in the context of the Pan-European transport corridor...***

The Pan-European importance of the Volga Basin is growing, especially in the context of the so-called Pan-European transport corridor that will connect Berlin-Warsaw-Minsk-Moscow-Nizhny Novgorod. Also under consideration is the transport water corridor; Volga-Don-Danube which would connect the large inland waterways of the Rhine, Main, Danube, Dneper, Don and Volga. East-West oil and gas pipeline systems intersect the Volga Basin. Today major freight shipments in the basin are carried by railroad, which follow and traverse the river. During the 1990s, the role of water-based transport (in terms of ferrying freight and passengers) declined. Today inland water transport in the basin is poorly integrated into the Russian and European transport system. The challenge is how to revive it and integrate it, considering the strategic dimensions of long-distance transport for the basin's economic growth and competitiveness.

**II. Institutional Frameworks in Practice: Environmental Risk Reduction and Sustainable Development in River Basins in the EU and Russia**

***12. Institutional frameworks establish basic context for implementation and actions of all stakeholders on the river basins...***

National and regional institutional frameworks provide a basis for the coordination and cooperation of diverse stakeholders in environmental management. This framework incorporates a system of legislation, policies and measures, tools and instruments, funding mechanisms, programmes and strategies, and administrative entities. It sets rules guiding individual and collective practices and behavior. In practice, however, there is quite often a disparity between the designed goals of institutions and results of their actions. The implementation process is accompanied by success and failures of institutions, and their effectiveness in changing the behavior of actors, or in amelioration of environmental situation sometimes might be lower than intended.

***13. The EU Water Framework Directive aims at tight coordination and integration of a variety of water-related policies and measures in the countries of Europe...***

The EU Water Framework Directive, adopted in 2000, incorporates basic provisions for integrated water basin management and lays important foundations for coordination between stakeholders along European rivers. It establishes a context for the coordination and integration of a variety of policies and measures, and also presumes territorial, sectoral and thematic coordination of actions and tools. Its key elements in that respect include:

- 1) adoption of a common and single approach to water management based on river basins (within it, usual administrative boundaries are no longer applied);
- 2) integration of all water sources' (i.e. rivers, lakes, coastal and ground waters) management into comprehensive schemes for each river basin;
- 3) setting a unified regime and coordinated objectives for the integrated management of surface and ground waters at the European level;
- 4) requirement for cross-border cooperation between all countries and administrative units and districts within individual river basin;
- 5) promoting active participation of all stakeholders, including NGOs and local communities in water management activities, and in particular in compiling, reviewing and updating river basin management plans.

***14. The new RF Water Code adopted in 2006 and the environmental institutional reform of the nineties has been a success of the 'new' Russia...***

During the nineties, a significant reorganization in Russian domestic and international environmental policy took place. New legislation was introduced, administrative reform took place, environmental management was decentralised, economic instruments and tools were brought in, wider participatory patterns were fostered (including the involvement of business and NGOs), alongside new environmental impact assessment rules, ecological *glasnost*, and support for international global environmental change agenda (Russia is party to a hundred or so international environmental treaties). A new Water Code is set to enter into force in 2007, and establishes an institutional framework for water governance in large river basins. The establishment of new institutional capacities for environmental management can be regarded a success of the "new" Russia. These institutional innovations established a basis, and opened the door to new challenges, for coordination and partnership between stakeholders. However, economic, social and political transition during the nineties together with opening new opportunities, has limited the application of many of these new environmental management tools, including those copied from the West and their effectiveness has been less than was predicted at the start of the reforms. The main challenges have been found to be associated with the recent administrative reform in Russia, and with advances in the market economy, which were expected to mobilize new human, technological, institutional and financial resources for environmental management.

***15. Coordination between stakeholders in large river basins is still insufficient both in the EU and Russia...***



Similarly to many other countries and despite efforts to apply a river basin management approach in the Volga Basin, these principles have not been sufficiently applied. Many coordination problems remain unsolved, and this indicates that:

- 1) integrated river basin management needs to be coordinated within broader socio-economic sustainability development schemes;
- 2) multi-layered institutions combined with an overlap of competences and responsibilities at various levels result in poor performance and insufficient coordination;
- 3) aside from the current emphasis on lack of financial resources, the crux of the problem is in identifying tools for their mobilization within the basin and the coordination of allocation mechanisms;
- 4) given the low rates of local public participation and initiative in environmental decision-making, poor use is being made of the rich traditional knowledge that exists in the basin's communities, preventing authorities from benefiting from this potential;
- 5) because insufficient coordination of stakeholders' interests is a bottleneck in problem-solving, applying tools and instruments that promote coordination and cooperation are top priority actions for basin authorities.

At the same time, however, the Volga Revival Programme (closed in 2004) has been a unique experience in basin-wide coordination and some of its participatory approaches have been successfully tested. The cooperation between Volga regions and their counterparts in the European Union, alongside the building of twinning partnerships, can be considered a backbone for pan-European environmental management and 'common environmental space' formation.

***16. A variety of efforts are undertaken in Russia to deal with existing problems of poor public participation in decision-making...***

An assessment of the opportunities to date for public participation in decision making through public hearings, suggests it has potential for wider domestic use in Russia. The RF Land Code of 2001 and the RF City Planning Code of 2004 have yielded innovative procedures, that support civil society dialogue related to land-use practice in the basin's riverside urban areas. Transparent decision-making can be considered a means for conflict resolution between various interest groups and for assuring the broader involvement of the public, overall enhancing support for public initiatives as opposed to the sometimes detrimental effect of protest actions. Legal zoning is a second instrument that might be considered for solving land-use conflicts in urban areas of the basin.

***17. Application of transport intermodality approaches are especially important within a river basin...***

Transport infrastructure must be integrated into sustainable development schemes for river basins. The problems and challenges associated with long-distance freight transport (and traffic) on inland waterways warrants particular attention. For instance, inland waterway transport can be considered ecologically safe and reliable, however, it is not sufficiently flexible and fast enough for rapid delivery and is not competitive with road and railway freighting. Different transport modes can be combined based on the principle of *intermodality*, which should be fostered as a standard transport principle. While in the EU, inland waterway transport in term of freight volume has seen a slight increase over the last fifteen years, in Russia, less than 4 percent of the total transport volume is carried by inland waterways (this is nevertheless similar to the level of the EU). This represents a sharp decline during the same period. The advent of the new century has seen considerable effort in Europe devoted to promoting the development of inland water transport and toward unifying the rules governing this sector. Internalization and multi-modality thus call for greater coordination and cooperation between stakeholders involved along the transport chain at the Pan-European level.

### **III. Human and Environmental Security: Flood Risk Reduction in the EU and Russia**

#### ***18. Floods are natural disasters that are natural by origins, but represent socially constructed risks...***

Human and environmental security in large river basins encompasses reduction of risk to people and environment posed by hydrological extremes such as floods and droughts. Floods are essentially natural hazards that occur regularly, but become disasters when they interact with human society. In most cases, natural factors are the main causes of floods, however, anthropogenic factors such as human occupation of flood plains, extensive urbanization, basin-wide land-use changes and structural measures to mitigate floods have modified the natural characteristics of extreme floods. Recent catastrophic floods in Europe and Russia show that human actions and traditional river engineering may even increase the frequency of small and medium floods and the human and economic damage. Also, it has become clear that reliance only on structural measures within flood defense has proved to be ineffective. This tends to interfere with natural river flow, offers protection only against minor or medium events, and creates a false notion of security amongst those living in flood prone areas (defenses might be ineffective in case of extreme events). Typically these local communities are not willing to adopt the full spectrum of necessary preventive measures, which increases their vulnerability.

#### ***19. Floods risk management is an essential element of integrated water management in a river basin...***

Flood risk management is a part of integrated water management within river basins. It is defined as a multi-dimensional and multi-disciplinary activity, which takes into account a combination of technical, institutional, economic, social and environmental aspects of flood risk reduction. It includes all stages of flood control including risk assessment, emergency preparedness, rescue, rehabilitation, flood prevention and mitigation. According to such a notion, the river basin is considered as a whole with downstream/upstream solidarity and coordination between all actors in the river basin (water agencies, municipalities, inhabitants, companies). Among existing loopholes within the scheme is, for example, the fact that major cities are often better protected than small livelihoods and rural communities within river basins, and the level of human vulnerabilities therefore is higher.

## ***20. Flood vulnerability assessment is particularly important at the local level...***

The assessment of the vulnerability of individuals or communities with respect to floods is an important component of disaster risk analysis. Any disaster risk reduction strategy needs to take into account the results of vulnerability analysis, which helps to pinpoint the necessary areas of intervention to reduce risk. Vulnerability assessment thus serves several purposes:

- 1) it allows the risk manager to identify vulnerable elements within community and to determine policies to alleviate them;
- 2) it contributes to determining more effective measures for protection, planning, and resource allocation in order to reduce risks.

However, vulnerability assessment is not a straightforward process. Vulnerability is often defined differently, depending on the background and interests of the involved scientists and practitioners. Risk toward any hazard can be determined by the probability of a hazard to become an actual event, and by the vulnerability of exposed communities. Several risk indicators have been developed for flood hazards, one of the best known is the Disaster Risk Index (DRI). It is applied at national scales, and combines the ratio of casualties due to floods over a number of individuals exposed to floods in a given year. It has been calibrated with data available between 1980-2000. Unfortunately, it does not provide practical information for decision-makers who must act to reduce flood risk and vulnerability in a particular region of a country, rather than at national scale. The United Nations University Institute for Environment and Human Security carries out vulnerability analysis at a local scale.

## ***21. Most lessons learned from the 2002 catastrophic floods in Europe are important for the Volga Basin...***

Between 1998-2002, Europe suffered about 100 damaging floods which affected 1.5 percent of its population, causing 700 fatalities, half a million displaced persons and EUR 25 billion in

insured economic losses. Extreme flood events in Central Europe in August 2002 caused heavy damages and loss of human life, and total flood losses were estimated to be about EUR 15-16 billion. Some lessons drawn from this flood indicate that many uncertainties still remain as to whether climate change intensified the peak floods that occurred in Central Europe. Direct human intervention in river basins are manifold for instance, and include canalization (and hence increased river velocity), modifications in river courses, losses of flood plains and retention capacity, increases in impervious landscape surfaces, changes in land-use patterns and intensive urbanization. A trend towards shorter flow-time is obvious and very probably the intensity of smaller and medium floods increased. In general there is no evidence that extreme floods intensify as they break dykes and inundate their old flood planes, as happened during the 2002 flood. The need for improving institutional responses includes inter-alia:

- 1) need for reliable forecasts;
- 2) an effective early warning system;
- 3) coordination between regional, provincial and local authorities for land development plans, especially in residential areas; and
- 4) the further development and revision of compensation mechanisms for affected livelihoods.

***22. Although the Volga River is highly regulated by the cascade of dams, the Basin is regarded as flood prone area...***

Flood risk reduction ranks high within the Russian natural disaster reduction agenda: about 400 thousand square kilometers is considered to be prone to flood. Flood mitigation is an integral component of the national institutional framework for natural disasters risk reduction. During the last decade more advanced results have been achieved in this sphere than in environmental protection. Within flood risk reduction strategies an emergency mitigation is well institutionalized, while flood prevention and flood mitigation is less developed. This clearly reflects the prevailing world practice where currently greater efforts and resources are directed toward emergency responses to floods, rather than toward capacity-building to mitigate their effects. Therefore new coordination mechanisms are being developed in order to better integrate the efforts of the Federal Agency for Water Resources (under the RF Ministry for Natural Resources) and the RF Ministry for Emergencies and their territorial branches. These target flood mitigation within the broader context of river basins' sustainable development. Although the Volga River is highly regulated by a cascade of dams and artificial reservoirs, the basin is regarded as a flood prone area and floods regularly occur. All small rivers in the basin and respective livelihoods are regularly affected. According to existing estimates, about 4.7 million basin residents are vulnerable to floods. In 2004, the value of flood damage in the Volga Basin was 958 million rubles, or 45 percent of the annual total national damage. The Volga-Kama cascade can be regarded as an interesting lesson in the application of flood mitigation

instruments over several decades, in the assessment of the pro's and con's of such structural measures. The toll on human life from the construction of the Volga's artificial reservoirs had been significant, having resulted in serious social tension due to the resettlement of individual livelihoods that have been flooded by the Volga's "artificial seas."

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