### Project Name
Serbia Irrigation and Drainage Rehabilitation Project Additional Financing

<table>
<thead>
<tr>
<th>Region</th>
<th>EUROPE AND CENTRAL ASIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sector</td>
<td>Flood protection (90%); Irrigation and drainage (10%)</td>
</tr>
<tr>
<td>Project ID</td>
<td>P105270</td>
</tr>
<tr>
<td>Borrower(s)</td>
<td>SERBIA</td>
</tr>
<tr>
<td>Environment Category</td>
<td>[ ] A [X] B [ ] C [ ] FI [ ] TBD (to be determined)</td>
</tr>
<tr>
<td>Date PID Prepared</td>
<td>March 12, 2007</td>
</tr>
<tr>
<td>Date of Appraisal Authorization</td>
<td>March 26, 2007</td>
</tr>
<tr>
<td>Date of Board Approval</td>
<td>June 14, 2007</td>
</tr>
</tbody>
</table>

1. **Country and Sector Background**

   The Republic of Serbia (ROS) has a population of about 10 million, of which some 50% live in rural areas, and 17% derive their living from agriculture and associated industries. The ROS has three major land forms – the plain areas in Vojvodina and the flood plains of the Danube, Sava and Drina rivers; the Morava valley in its main stream and two southern arms; and the mountainous areas which cover most of the central and southern parts of the country. The water resources of ROS in addition to rainfall are dominated by the river inflows from upstream riparian sources estimated at 85% of available water. The balance is derived from the River Morava from within the country. Due to seasonal variations there are some 160 storage dams, some of which have hydro-electric generation facilities. The rivers are subject to extreme flows which cause damaging floods along the adjacent lands.

   About half of the Serbian population lives in rural areas where poverty has been on the rise despite the recent decline in the overall national poverty rate. Agriculture, including agro-processing, accounts for about 25% of Serbia’s GDP and 26% of its exports. The sector sustained the population through the difficult decade of the 1990s which were marked by economic sanctions, armed conflicts and dramatic economic decline. Nevertheless, when FRY rejoined the world community in 1999, misguided policies (see below) and economic hardships had left Serbia’s agriculture with most of its global market share lost and significant inefficiencies in production which make Serbian agricultural products uncompetitive on global markets. The latter are mainly due to high production costs and average yields that are lower than Western European levels, brought about by reduced nutrient content, outdated field and processing equipment, poor drainage in large areas in Vojvodina and Central Serbia on the one hand and low precipitation in parts of Central Serbia on the other hand, and, exposure to flood hazard in large parts of Serbia. Addressing these issues would help Serbia agriculture attain its full potential in contributing to the economy of Serbia and poverty reduction in rural areas.

**Geographical dimensions of Serbian agriculture**
Serbia can be largely divided into three agricultural regions where topography, soil type and climatic conditions have influenced the type of agricultural products and farming systems. About 65% of Serbia’s arable land lies in Vojvodina, which is characterized by large stretches of flat plains and highly fertile “black soils”. The region mainly produces field crops, notably wheat, maize, sugar beet, other industrial crops and livestock, including most pig production of Serbia, and to a lesser extent cattle and poultry, mostly in large farms. The region is flat with a high water table and subject to flooding. A vast and complex system of canals, pumping stations and associated structures, the Danube-Tisa-Danube Hydro system, was established to serve the purposes of drainage, flood control and irrigation, as well as transportation and municipal water supply in the region. The topography in Central Serbia includes both flood plains of the Danube, Save and Morava rivers, and hills. Here farms are mainly of small and medium size, and farming systems are more diverse than in Vojvodina. Arable land is limited, but soil fertility and climatic conditions favor fairly intensive production of high-value fruits, notably berries, and vegetables. Cattle for milk production dominate livestock production. Southern Serbia is mostly hilly, farm sizes are small, production is mostly extensive, fruits and vegetables are the main crops, and sheep grazing on natural pastures dominate livestock production.

Agricultural Policy

Serbia inherited from its socialist past a policy and institutional framework that is centered around large scale agrokombinats1 (AKs), which covered about 15% of arable land. Agricultural input and credit provision were channeled through the AKs, as was the procurement of crops from small holders at predetermined prices. Agricultural research and extension as well as irrigation and drainage services were geared towards the needs of AKs, practically ignoring the needs of small producers which cultivated around 85% of arable land. Trade policy was geared towards self sufficiency as well as export promotion of industrial crops, whereby economic costs and benefits rarely played a role.

Recent years have witnessed a gradual, albeit slow reform process in the agriculture sector. Restructuring of AKs is underway and a number of agro-processing units have been privatized, while the Government is now seeking the privatization of farm units as well. Progress has been made in trade restrictions in a bid for WTO membership and initial steps have been taken to establish an EU rural development payment agency to replace crop based subsidies. The recently published Agricultural Development Strategy of the Ministry of Agriculture, Forestry and Water Management (MAFWM) prescribes far reaching reforms in the agricultural sector with the ultimate aim of improving the sector’s competitiveness in the world. One of the pillars of the Strategy is to reform the policy and institutional set-up in such a way that private farmers can operate on a level playing field so that they can realize their potential of becoming the motor force of agricultural development and provide for employment. This includes mainly the replacement of crop-based subsidies with rural development grants, restructuring of the

---

1 Agrokombinats are large scale integrated production units made up of crop and livestock farms, agro-processing facilities, and in some cases, own distribution chains. They were socially owned.
agricultural research and extension system to respond to the needs of farmers and agro-processors in a competitive market economy, putting in place an enabling environment for bottom-up establishment of marketing cooperatives, and addressing demand and supply side constraints to access to financial services in rural areas. The 2005 – 2007 World Bank Country Assistance Strategy for Serbia and Macedonia includes a US$ 27 – 40 million Rural Business Environment Project that would support the Government in these objectives. The European Union has provided significant assistance for the restructuring of the sector, most notably in support of harmonization of the sanitary and phyto-sanitary control system.

Water Resource Management

All agricultural and hydraulic activities fall under the Ministry of Agriculture, Forestry, and Water Management (MAFWM). The Directorate of Water (DoW) under MAFWM controls most hydraulic operations through two Public Water Companies, the Vode Vojvodine Company for Vojvodina specifically, and the Serbiavode Company for the remainder of the country. MAFWM and its subordinate Departments and Directorates are supported by long established technical institutes and the universities. These agencies at present suffer from diminished professional staff due to migration, and equipment and facilities also require modernization and rehabilitation.

The key issues facing water resources management in ROS can be summarized as follows:

*Policy and Institutional Issues in irrigation, drainage and flood control.* Despite its long tradition, water management in Serbia is currently suffering a serious challenge. This is the incapacity of the current water sector institutions to provide a sufficient level of operations and maintenance (O&M) for water infrastructure that is rapidly deteriorating and, in some cases, is already collapsed or at risk of collapsing. Lack of adequate financial resources for O&M is more the consequence than the cause of this inefficient set-up, that is characterized by overlapping mandates among water organizations, inadequate incentives and accountability between water sector organizations, unclear division between regulatory and management functions, lack of involvement of users in water management, lack of competition among companies contracted for O&M of infrastructure, etc. As a result of poor O&M, recovery of its costs is also poor and since those scarce resources are also ineffectively used (basically can only fund part of the salary needs of the water management companies) and budget transfers are limited, implementation of O&M activities is continually on the decline (currently estimated to be at 10-30 percent of the amount needed).

In substance of this vicious circle seems to be well established and there is a urgent need to reorganize the sector introducing measures such as a more participatory and integrated approach to water management that would include changes in the legal and regulatory framework and would aim at achieving an increased accountability from institutions involved in water resources management. The water sector strategy of MAFWM addresses in broad terms these issues but leaves undefined the basic vision, approaches and timing to be taken for governance, management, financing, regulation and provision of support services. The water sector strategy of MAFWM emphasizes legal tools, such as the law on water management and the law on financing of water management. A new Water Law has also been drafted and is line with the EU
Water Framework Directive, including principles of the “user pays”, “polluter pays” and river basin management.

**Drainage:** It is estimated that 29% of the surface area of the country and 2.67 million ha (or 52%) of agricultural land is affected by poor drainage. In Vojvodina specifically, due to its level terrain, some 1.61 million ha are affected, representing about 90% of agricultural lands in that region. To address the drainage and waterlogging threat, some 2.08 million ha nationwide have been provided with drainage facilities in over 400 drainage areas, and incorporating 210 pumping stations and 22,600 km of drainage channels. Over 58,000 ha are equipped with tile sub-drainage. Due to neglect caused principally by lack of funds during the past decade period, the drainage channels have generally deteriorated by siltation and weed growth, and the associated structures and pumping stations have also deteriorated. Widespread rehabilitation is required. It is estimated that for field crops, which would be most affected, correction of defective drainage would result in crop yield increases of between 20% and 30%.

**Flood Control:** It is estimated that some 1.57 million ha, especially in areas adjacent to the large flood plain rivers, are subject to flooding. Of this area, 1.45 million ha are in Vojvodina and the plains east of Belgrade; the rest are in Central Serbia. About 30% of agricultural land is vulnerable to flooding, as are 512 larger settlements, 515 industrial installations, 4,000 km of roads, and 680 km of railways. To meet this hazard, the Government has constructed 3,434 km of flood amelioration levees and 30 flood control reservoirs. However, even with this large investment, extreme floods can still cause damage. Crop loss due to flooding ranges from marginal to complete, depending on the inundation period.

Due to lack of maintenance on the levees, dams, and their appurtenant structures, the system requires rehabilitation. Gaps need to be filled, and older levees should be heightened to meet more stringent protection criteria. Without attention to these flood protection facilities, additional investments in irrigation and drainage improvements in the areas prone to flooding would be pointless. Work in this sub-sector is therefore of the highest priority and would result in rapid and substantial benefits.

**Irrigation:** Under the former Federal Republic of Yugoslavia (FRY), irrigation development covered some 120,000 ha in Serbia. This represents only about 3% of the arable land of the country. The majority of schemes covering some 90,278 ha were in Vojvodina, with the balance located in Central Serbia, mainly in the Drina-Save enclave near Belgrade, and in the Morava valley. Today, due to various factors outlined below, only about 35,000 ha are actually fully utilized, with a further 47,000 ha partially functional. Schemes have ceased to function optimally or totally due to lack of maintenance, breakdown in management, deterioration and disincentives due to lack of markets, etc.

In the valleys of Central Serbia, with their more sloping terrain and smaller private farms, a combination of sprinkler, drip and surface methods is practised. However, irrigation in this area is not common. The introduction of small irrigation in selected areas of Central Serbia with low rainfall and light soils could significantly increase the yields of high value horticultural crops,
notably raspberries, blackberries, cherries, plums, blueberries, apples, pears, vineyards and vegetables.

2. Objectives

The Additional Financing would scale-up the flood protection activities under IDRP to generate a substantial impact in terms of losses avoided by the end of the project. The incremental activities would fall entirely under the original second objective of the project, to "reduce the risk of damage from flooding to land, crops, property, and infrastructure as well as reducing risk of life loss from flooding in project areas". The Additional Financing would allow for a significant expansion in the geographical scope of flood protection activities under the IDRP, which would not, for example, provide for any improvement in protection against floods originating in the northeast, from Romania and Hungary. The largest single basin effort covered by the Additional Financing would be the Tisza River, which cuts through Vojvodine southward to the Danube, and which suffered most severely in 2006. A significant effort would also be mounted along the Tamis, also coming from the north, which suffered worst in 2005. Among the smaller rivers, the Velike Morava south of the Danube would now also be included in the program. Altogether, the Additional Financing activities could provide mandated protection levels for 500,000 ha of land and 2.5 million people.

The activities envisaged will strengthen the results expected under both Goals 2 and 3 of the Country Assistance Strategy for FY05-07 by helping to further improve agricultural output and exports and to further protect poor and vulnerable populations from the potentially devastating effects of flooding.

3. Rationale for Bank Involvement

Serbia has requested additional financing to scale up the scope of the flood control program covered by Component 1 of the IDRP, titled Rehabilitation and Improvement of Drainage and Flood Control Infrastructure. The rationale for this Additional Financing is thus that covered by para. 1(b) of OP 13.20. The serious floods of 2005, followed by the more severe ones of 2006, have made it clear that additional resources are required quickly in the water resource sector in general, and the flood defense subsector in particular, given the weaknesses in the inherited infrastructure and the apparently mounting severity of the problems. The size of the initial lending (US$25 million equivalent) was limited by IDA and absorption capacity constraints, and represented only a small fraction of the original requests of the sector agencies; within that sum, the US $8.6 million allocated to flood control will finance only about 6.5 km of major dike rehabilitation on the upper Danube left bank and about 2.2 km along the Sava River near the confluence with the Drina, protecting about 56,000 ha and 250,000 people in Vojvodine and northwest Serbia. Given that the floods of 2006 inundated 122,000 ha of land, caused 112,000 ha more to be flooded by rising groundwater, and caused 5,500 ha to be damaged by landslides, and indeed flooded parts of many major towns including Belgrade, the Government of Serbia (GOS) has requested urgent additional support from the Bank for flood protection with the goal of significantly reducing the impact of floods in the future. This will allow the GOS and the Bank to significantly scale up the results expected from the original Irrigation and Drainage Rehabilitation Project (IDRP). Of course, even the Additional Financing would represent only a beginning in bringing Serbia's flood defenses to a reasonable state and up to required protection standards, as such infrastructure in nations and regions facing the sea or major, flood-prone
4. Description
The total cost of the Additional Financing would be about US$62.5 million, of which US$ 50 million would be financed by the Bank and US$ 12.5 million equivalent by the Government of Serbia (GOS). The project will finance GOS proposed flood control program covering all main rivers in the country and including a reconstruction (about US$43.4 million) as well as a rehabilitation program (about US$19.0 million). The project would scale-up two components of the on-going IDRP:

Component 1: Rehabilitation and Improvement of Drainage and Flood Control Infrastructure (US$62.5 million) – scale-up activities would include: (i) rehabilitation works (about 80 small works) that affects major (e.g., Danube, Tisaza, Sava, Tamis) as well as smaller rivers and are more in the nature of emergency repair taking care of major landslides, culvert collapses, rebuilding retaining walls, and structures guiding and regulating flows. The rehabilitation program (totalling US$19.0 million) also includes rebuilding or protection of pump stations, embankment foundations as well as crests, and rehabilitation of embankments; and (ii) reconstruction works (about US$43.4 million) consisting of larger, continuous efforts along the four major streams - the Danube, Tisza, Tamis, and Sava - and strengthening about 89 km of flood defenses. In the reconstruction program there is also a provision in the first year of additional financing for mobile equipment (mainly pumps) to be kept in reserve on the left bank of the Danube near Novi Sad, to be used to help evacuate localized flooding behind the embankments, including that caused by local rainfall.

Component 2: Project Management and Monitoring (US$ 1.0 million): scale-up of this component would provide support to the Government to implement the project, including funds for: (i) overall project management and technical assistance in such areas as detailed design, contract administration and construction supervision, procurement and financial management, and participatory water management institutions; (b) monitoring and evaluation of project impacts; development of environmental management plans for rehabilitation and construction activities carried out under the project; and (d) annual financial audits of project accounts.

5. Financing

<table>
<thead>
<tr>
<th>Source</th>
<th>($m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borrower</td>
<td>12.5</td>
</tr>
<tr>
<td>International Bank for Reconstruction and Development</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>62.5</strong></td>
</tr>
</tbody>
</table>

6. Implementation
The implementation arrangements are similar to those under the IDRP. Project design and implementation arrangements are also proposed to remain the same, although a few additional staff may be needed in the Project Implementation Team (PIT), and the size of contracts will be reviewed during preparation/appraisal in order to encourage more competition. All relevant
7. Sustainability
The project will support policy and sector reform, by financing selected high priority activities which promote a social and economic sustainability, especially for irrigation and drainage systems. Additionally, the project will continue strengthen the strategic capacities of DoW in this area by providing technical assistance and stimulating a dialogue with the international community to increase commitment toward a better balanced and participatory management of water resources.

8. Lessons Learned from Past Operations in the Country/Sector
The original project is rated satisfactory for both implementation progress and development objectives, and both that project and all flood works proposed to be added now would be finished by the original closing date of May 31, 2011. The water companies (Vode Vojvodine and Serbiavode) and Directorate of Water (DoW) under the Ministry of Agriculture, Forestry, and Water Management (MAFWM), have proposed to upgrade mandated protection levels nationwide to 100-year recurrence levels for agricultural and general land, and, in line with international practice, 1000 years for urban and industrial settlements, and to rehabilitate and reconstruct under this project existing defense lines along the vulnerable stretches of the Danube, Tisza, Sava, Tamis, and smaller rivers connecting to them (e.g. the Nera, Nadela, Brzava, Keres Rivers and their interconnections with the Danube-Tisza-Danube Canal system) to achieve those standards. Contracts to those standards for the limited reaches originally included in the project are about to be let, but they would be rapidly augmented in calendar 2007 itself by much larger reaches if Additional Financing is approved.

9. Safeguard Policies (including public consultation)

<table>
<thead>
<tr>
<th>Safeguard Policies Triggered by the Project</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Assessment (OP/BP 4.01)</td>
<td>[X]</td>
<td>[]</td>
</tr>
<tr>
<td>Natural Habitats (OP/BP 4.04)</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Pest Management (OP 4.09)</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Physical Cultural Resources (OP/BP 4.11)</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Involuntary Resettlement (OP/BP 4.12)</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Indigenous Peoples (OP/BP 4.10)</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Forests (OP/BP 4.36)</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Safety of Dams (OP/BP 4.37)</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Projects in Disputed Areas (OP/BP 7.60)*</td>
<td>[]</td>
<td>[]</td>
</tr>
<tr>
<td>Projects on International Waterways (OP/BP 7.50)</td>
<td>[X]</td>
<td>[]</td>
</tr>
</tbody>
</table>

The additional financing project has been proposed as environmental assessment category "B" and triggers the Bank policy OP/BP 4.01 on Environmental Assessment. An Environmental Assessment (EA) was prepared for the IDRP as part of the Framework Environmental Impact Study. The Study includes assessment of potential impacts of the proposed project and the likely

*By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas
significance of such impact, recommended mitigation measures, outline of monitoring plan and organization responsible for implementation of mitigation measures. Specific EAs have been prepared for the proposed flood and drainage schemes, while a framework EA has been prepared for the irrigation schemes. A site specific EMP for the first irrigation scheme is presently being developed. A public consultation and disclosure process was undertaken in accordance with World Bank policy and guidelines. The EA was publicly disclosed in March 2005. The existing EA (developed under IDRP) is used for the works that are considered for the Additional Financing together with corresponding EMPs.

All Danube riparians were informed of the initial project, and no objections were received, but this approach was specifically based on the irrigation component of the project, which will eventually abstract an extremely small proportion of the enormous transboundary flows through Serbia. The flood control works, including all works under the Additional Financing, will not adversely change the quality or quantity of water flows to the other riparians and will not be adversely affected by the other riparians’ possible water use, and thus is exempt from the notification requirement of OP 7.50.

10. List of Factual Technical Documents

Draft Concept Memorandum for Additional Financing (US$50 million), under OP 13.20
Serbia and Montenegro Water Resources Management Project, First Preparation Mission Report, FAO/CP
Serbia and Montenegro Water Resources Management Project, Final Preparation Report, FAO/CP
Social Assessment, Blackstone Consultants
Framework Environmental Impact Study, Serbia Irrigation and Drainage Rehabilitation Project
Minor Irrigation Feasibility Reports (for three schemes)
Background papers on Institutional Aspects
Institutional workshop proceedings

11. Contact point
Contact: Mr. Usaid I. El-Hanbali
Title: Sr Water Resources Engr.
Tel: (202) 458-1925
Fax: (202) 614-1115
Email: Uelhanbali@worldbank.org

12. For more information contact:
The InfoShop
The World Bank