

Eurasian Development Bank  
Resources Manager of Eurasian Fund for Stabilization and Development

**APPRAISAL**

of  
Application  
of  
the Republic of Armenia

for Investment Loan  
to be provided by the Eurasian Fund for Stabilization and Development  
for the Irrigation System Modernisation Project

in the amount of US\$ 40 million

June 2015

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**Republic of Armenia**  
Fiscal year: January 1 – December 31

**National currency exchange rate**  
As of June 1, 2015

Currency unit	Dram
1 Russian rouble	8.98
1 Kazakhstani tenge	25.71
1 US dollar	478.05
1 Euro	521.89

**System of weights and measures: Metric**

**Acronyms and Abbreviations**

ACF, the Fund – Anti-Crisis Fund of the Eurasian Economic Community
CA – current account
CIS – Commonwealth of Independent States
EDB, the Manager – Eurasian Development Bank
EFSD – Eurasian Fund for Stabilization and Development
EurAsEC – Eurasian Economic Community
FDIs – foreign direct investments
FS – Feasibility Study
GDP – gross domestic product
GNI – gross national income per capita
IBRD – International Bank for Reconstruction and Development
IDA – International Development Association
IDBs – International Development Banks
IFIs – International Financial Organisations
PIU – Project Implementation Unit – National Institution Water Sector Programme
Implementation Unit, State Committee of Water Management, Ministry of Agriculture of the Republic of Armenia
RA – Republic of Armenia
SCWM – State Committee of Water Management of the Republic of Armenia
TF – ECA Capacity Development Trust Fund of the WB (ECAPDEV)
WB – World Bank Group
WUAs – Water user associations of the Republic of Armenia

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# I. LOAN INDICATIVE TERMS SHEET RECOMMENDED BY THE MANAGER

Beneficiary	Republic of Armenia
Responsible government bodies and organisations of the Beneficiary	Ministry of Finance of the Republic of Armenia; State Committee of Water Management of the Republic of Armenia; National Institution Water Sector Programme Implementation Unit, State Committee of Water Management, Ministry of Agriculture of the Republic of Armenia (Project Implementation Unit).
Project Company	Participation of the Project Company (Ultimate Beneficiary) is not contemplated. The rights and responsibilities of the Project Company (Ultimate Beneficiary) fixed in the EFSD documents are assigned to the Beneficiary. The provisions of the EFSD documents regulating the issues of investment financing extended by a member state of the EFSD to a Project Company (Ultimate Beneficiary) are not applicable.
Project title	Irrigation system modernisation and institutional capacity building
Project sector	Agriculture (irrigation)
Main objectives	<ul style="list-style-type: none"> <li>• improved efficiency of irrigation systems;</li> <li>• larger area of irrigated land; and</li> <li>• management capacity building and improved equipment capacity of water user associations (WUAs), creation of WUA Federations.</li> </ul>
Key performance indicators	<ul style="list-style-type: none"> <li>• lower electricity consumption in selected irrigation systems and improved efficiency of irrigation systems;</li> <li>• lower operation and maintenance costs in selected irrigation systems;</li> <li>• larger area of irrigated land; and</li> <li>• management capacity building and improved equipment capacity of WUAs, creation of a pilot WUA Federation.</li> </ul>
Purpose of the Fund's loan	Payment of reasonable prices under contracts signed by the Beneficiary as part of Project implementation activities, and operating expenses of the Project Implementation Unit to be funded by the Investment Loan.
Amount committed by the Fund	US \$40 million
Beneficiary's Project co-financing	At least US \$10 million
Financial terms of the Fund's loan extended to the Beneficiary	<ul style="list-style-type: none"> <li>• Interest rate: 2% annual</li> <li>• Risk premium: not applicable</li> <li>• Front-end fee: 0.5% of the amount of financing</li> <li>• Commitment fee: not applicable</li> <li>• Margin: not applicable</li> <li>• Loan maturity, including grace period: up to 20 years</li> <li>• Grace period for principal repayment: up to 10 years</li> <li>• Share of grant component: 30.79%</li> <li>• Project co-financing by the Beneficiary: at least US \$10 million (20% of the Project cost)</li> </ul>
Loan availability end date	30 June 2021
Project closing date	31 December 2020
Investment Loan availability	30 June 2021

end date	
Procedure of disbursing funds to the Beneficiary	The Fund's resources are to be provided to the Beneficiary in accordance with the World Bank disbursement procedures using the following methods: <ul style="list-style-type: none"> <li>• an advance transferred to the Dedicated Account;</li> <li>• direct payments to accounts of contracted suppliers.</li> </ul>
Frequency (schedule) of interest payments	Every six months, on the 30 <sup>th</sup> day of the last month of each calendar six months, starting from the six-month period, in which the first disbursement under the Investment Loan was made, and ending on the date of the final Principal payment under the Investment Loan
Principal repayment schedule	Every six months, on the 30 <sup>th</sup> day of the last month of each calendar six months, starting on 30 December 2025 and ending on 30 June 2035, in equal payments of US \$2 million

## II. MANAGER'S APPRAISAL REPORT ON APPLICATION

This Appraisal Report concerns the application of the Republic of Armenia (hereinafter referred to as the Applicant) for an investment loan financed with the EFSD resources (hereinafter referred to as the Loan) in the amount of US \$40 million received by the Bank on 27 May 2015 by letter No. 52/13551-15 (hereinafter referred to as the Application). The key declared objective of the Loan is to finance the Irrigation System Modernisation Project (hereinafter referred to as the Project).

Section 3 of this document contains rationale for the Appraisal of the application by the EFSD Resources Manager's (hereinafter referred to as the Manager).

Having examined the Application, the Manager hereby requests the EFSD Council to consider the following recommendations and conclusions:

### **1. Compliance of the Application with the Mission Statement of the Fund, its funding objectives, lending policy and conditionality, as defined by the Treaty on the Establishment of the Fund, the Statute of the Fund, the Regulation on the Use of Fund Resources for Providing Investment Loans, and relevant decisions of the EFSD Council:**

- The Application is executed in full compliance with the requirements of the Fund. The depth of elaboration of the Application in terms of the data required for evaluation purposes and supporting documentation to enable a preliminary completeness approval is deemed satisfactory.
- The Project is consistent with the EFSD Mission Statement. The Project supports the objectives set out in the Sustainable Development Programme of the Republic of Armenia in relation to the irrigation system modernisation, water supply quality improvement, and application of democratic management principles by water user associations (WUAs). A well developed irrigation infrastructure is needed for sustainable development of Armenia's agriculture; therefore, if implemented, the Project will promote improved sustainability of the economy and the balance of payment of the Republic of Armenia. The Project is also characterised by a moderate integration effect: its implementation will enable expansion of agricultural exports from Armenia to the CIS countries.
- The Republic of Armenia has met all the qualification criteria defined by the Treaty on the Establishment of the Fund, the Statute of the Fund, and decisions of the EFSD Council. The commitments to pay in the initial cash contribution have been complied with in full. According to the information available to the Manager, the Republic of Armenia has no unsettled debt to the Fund member states or to any major international financial organisations. By the date of the Loan approval by the Fund Council, all relevant supporting letters will have been received. The requested amount is within the country limit set for the Republic of Armenia (US \$1,106.7 million), taking into account the project "Construction of the North-South Road Corridor" (Phase IV) (US \$150 million) approved by the EFSD Council and the submitted application for a financial credit (US \$800 million).
- The Manager recommends to assign to the Beneficiary the rights and responsibilities of the Ultimate Beneficiary established by the Regulation on the Use of Fund Resources for Providing Investment Loans and other EFSD documents, as no Project Company is included in the Project design.

**2. The Manager will monitor and perform appraisal of the Project in accordance with EDB's monitoring procedures.** The monitoring procedures will involve collection of information on the progress of the Project implementation, i.e. on the progress in achieving the Project monitoring indicators, on implementation of the Project Procurement Plan, as well as Project financial reports (see more detailed information in Section 4.7).

**3. Application of policies of the World Bank (hereinafter referred to as the WB) in the process of Project implementation.**

- The Project is a follow-up to the WB’s multi-year irrigation programme in the Republic of Armenia (RA). Thus, to ensure compliance of the whole programme with high standards, the Manager and the IBRD have executed an Agreement on cooperation of the two institutions in the process of project preparation and implementation<sup>1</sup>. Under the terms of the Agreement, IBRD policies and procedures should be applicable in the process of the Project implementation. Therefore, the Manager is recommending to apply the following policies and procedures for the purposes of the Project:

- WB environmental and social policies: *WB Operational Policies 4.01. “Environmental Assessment”, January 1999, WB Operational Policies 4.12. “Involuntary Resettlement”, December 2001, and WB Operational Policies 4.09. “Pest Management”, December 1998.* The Project preliminary appraisal has shown that it may have some minor social and environmental impacts. The environmental and social policies of the Manager provide for the option of setting additional requirements to EFSD projects, including application of environmental and social policies of other IFIs.

- WB procurement policies: *Guidelines of the International Bank for Reconstruction and Development (IBRD): “Guidelines: Procurement of Goods, Works and Non-consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers”, January 2011; “Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers”, January 2011.* Under Procurement Policies for Projects Financed with the EFSD Resources, approved by the EFSD Council on 10 July 2013, Minutes No. 11, procurement procedures of other IFIs, including the IBRD, can be applicable to finance contracts using the Fund’s resources. To ensure competitive and transparent procedures, the Manager is proposing to apply Procurement Guidelines of the IBRD in the part consistent with the Procurement Policies of the EFSD and use standard tender documentation of the IBRD.

- WB disbursement procedures: *Disbursement Handbook for WB Clients, May 2006, and WB Disbursement Guidelines for Projects, dated 1 May 2006.* The Manager proposes to provide the Investment Loan using the following methods: an advance transferred to the Dedicated Account and direct payments to accounts of contracted suppliers on condition that supporting documents are provided to the Manager to confirm targeted use of funds.

- WB policies on disclosure of information: *WB Policy on Disclosure of Information, June 2002.*

**4. Mobilising the WB’s expertise.** In accordance with provisions of the Agreement between EDB and the WB on cooperation in the process of Project preparation and implementation, the WB financed the Project preparation from the Capacity Development Trust Fund for the Countries of Europe and Central Asia (US \$495,000). Under that agreement, in addition to applying the policies specified in paragraph 3, the Manager undertakes to mobilise the WB’s expertise to monitor Project implementation in accordance with the requirements of the aforementioned policies and procedures. In particular, it involves engagement of experts on procurement, financial management, monitoring, social and environmental policies, technical experts specialising in various fields, including institutional issues. In this case, the Manager is fully involved in the Project implementation, developing its expertise in cooperation with the WB and ensuring a high quality of the Project implementation.

**5. Financial conditions for providing EFSD funding to Beneficiary.** In accordance with paragraph 12 and Appendix 1 of the Regulation on the Use of Fund Resources for Providing Investment Loans, the Manager recommends to define financial conditions for the Investment Loan

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<sup>1</sup> The Capacity Development Trust Fund for the countries of Europe and Central Asia (ECAPDEV) was created in 2011 with the resources provided by the Government of the Russian Federation and is managed by the WB. The objective of providing grants is to ensure better quality of investment project preparation and build the institutional capacity of project implementation agencies.

taking into account the need to comply with the requirement of the IMF Programme on the share of the grant component of at least 30%.

### III. RATIONALE OF APPRAISAL

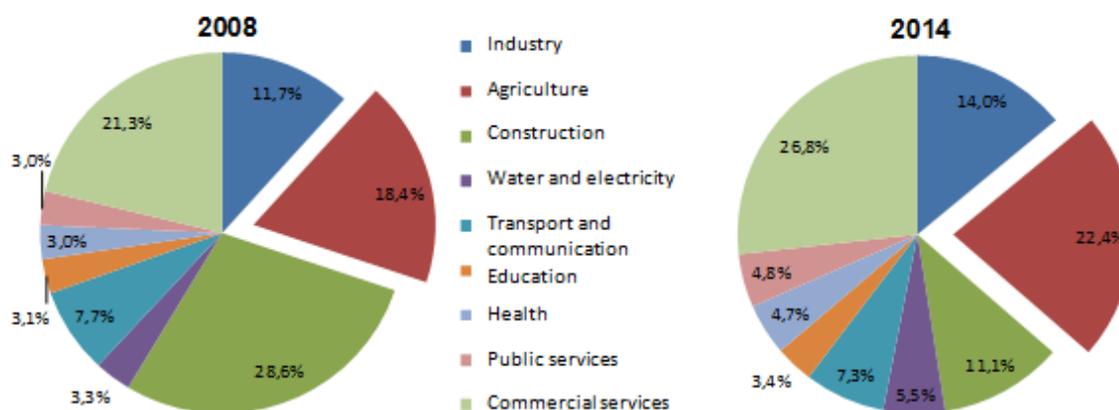
#### 3.1. Overview of Social and Economic Developments in RA

The Republic of Armenia is a middle income country: according to some preliminary estimates of the Manager, the GDP per capital on a purchasing power parity basis was US \$7,800 in 2013<sup>2</sup>. In 2014, taken in current prices, the GDP made US \$10.9 billion or US \$3,600 per capita. The poverty rate remains relatively high: in 2013, it was 32%; yet there is no indication of any significant improvement compared to the pre-crisis level of 27.6% in 2008. The unemployment rate also remains high – around 17.8% in 2014.

Since the country has got limited natural resources and a small economy, it greatly depends on foreign trade. Exports account for 31% of GDP, while imports exceed 50% of GDP. Armenia’s key trading partners are Russia, EU countries, as well as Iran, China, and the USA. Russia is the main market for Armenian agricultural and manufactured products. Armenia’s accession to the Eurasian Economic Union on 1 January 2015 can result in stronger integration with Russia. Europe, on the other hand, is the key market for Armenian exports of non-ferrous metals and mineral products. At the same time, Armenia's land-locked status, rugged mountainous terrain of much of its territory, and the economic blockade imposed by two neighbouring countries (Azerbaijan and Turkey) hamper the development of its trade relations.

The most important sectors for Armenia’s economy are agriculture, trade, manufacturing, and construction. Against the background of a steady decline of the share of construction in the GDP, which started in 2008, other sectors, primarily those driven by domestic demand, are growing. In 2014, the respective shares of these sectors of the economy made 19.7%, 12.3%, 10.1%, and 9.8%<sup>3</sup> of GDP (Figure 1).

Figure 1. Structure of Armenia’s GDP in 2008 and 2014, % of GDP



Armenia remains highly vulnerable to external and internal shocks. Inflation and growth rates are volatile, the current account deficit and dollarization of the economy are at a precariously high level, whereas the significant increase in the government external debt during the global crisis

<sup>2</sup> Based on World Bank data; calculated based on the purchasing power parity.

<sup>3</sup> National Statistical Service of RA

reinforces the need for continued reform in the area of fiscal consolidation. The economy's dependence on external factors is also largely determined by wages of migrant workers and current inward remittances, which total around 18-20% of Armenia's GDP.

The country has achieved certain progress in forming a favourable business climate and ranked the 45<sup>th</sup> in the WB "Doing Business" report of June 2014. However, there are still some outstanding issues related to establishing a favourable environment for enhanced competition, relatively underdeveloped financial intermediation, insufficient financing of human development, as well as underdeveloped infrastructure.

### **3.1.1. Macroeconomic Situation**

The pattern of Armenia's development in the 1990s was seen as extremely uneven that was related to transition challenges and the armed conflicts in Nagorno-Karabakh. The real GDP growth varied from negative 42% in 1992 to 7.3% in 1998 and was accompanied by high and unstable prices.

In 2001-2007, until the start of the global crisis, the country's growth rates were high averaging 12.6% per year. Until 2002, that was a result of high rates of labour productivity, favourable external demand<sup>4</sup>, and flexible exchange rate policies<sup>5</sup> promoting export growth. Starting from 2003, in addition to the improved external market situation faster growth in Russia, the key drivers of GDP growth were significant cash inflows generated by Armenian diasporas in the form of FDIs and remittances from migrant workers invested in non-tradable sectors of the economy – construction, domestic services and retail trade. As a result, the share of construction in GDP increased from 16% in 2003 to 25.3% in 2008<sup>6</sup>, while the average rate of retail trade growth for that period was 10.3% per year.

The development of construction had a positive effect on employment rate and consumption<sup>7</sup>. The average rate of inflation, as at end of period of 2001-2007, was quite low at 3.9% that was facilitated by favourable import prices, and prudent monetary policies followed by the Central Bank of Armenia (CBA), including transition to inflation targeting from 2006. That was accompanied by accelerated development of sectors focusing on the domestic market and appreciation of the real exchange rate of dram that lead to lower exports and growing foreign trade deficit, which exceeded 25% of GDP in 2008. Significant money remittances and inflows of foreign capital, primarily in the form of FDIs, helped not only finance the current account deficit, but also accumulate international reserves, which grew at 5% of GDP on average per year in 2005-2007.

The global financial crisis resulted in lower inflows of external financing, including lower current transfers, which dropped by 35%, leading to a collapse in the construction sector and GDP decline by 14.1% in 2009. The GDP decline was accompanied by unemployment growth and rising poverty rates. Stagnating domestic production of exported goods, plummeting remittances of migrant workers and FDIs lead to a sharp increase in the current account deficit from 6.4% of GDP in 2007 to 15.8% of GDP in 2009. The anti-crisis measures implemented by the Government helped smooth the decline of household incomes, but widened the budget deficit to 7.9% of GDP against 1.2% of GDP a year earlier. The inflation accelerated to 6.7% against 5.3% a year earlier.

In 2010-2012, the economic growth (4.7% on average per year, 7.2% in 2012) was largely driven by the post-crisis recovery of domestic demand accompanied by strong growth of remittances

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<sup>4</sup> Armenia's key exports include non-ferrous metals, and prices for some of them grew by the factor of 2-5 in that period.

<sup>5</sup> The real exchange rate of dram depreciated over that period by 15%.

<sup>6</sup> The share of investment in GDP grew over that period from 25% to 40%.

<sup>7</sup> Growth of construction was most beneficial for employment and consumption of 40% of the population with lowest incomes. According to the World Bank, incomes of this group grew in 2006-2008 by 6.5% compared to 5.2% growth for the population in general.

of migrant workers, as well as effects of the anti-crisis measures taken by the Government. On the production side, while the declining trend continued in the construction sector, industry and agriculture became the key drivers of growth. High prices for metal and mineral products facilitated the development of industrial production (11% on average per year) and export growth (7%). Favourable weather conditions helped generate growth in the agricultural sector at 11.5% on average per year.

In 2013-2014, the country's economic growth decelerated to 3.5% against 7.2% in 2012. The GDP growth remained positive in 2014 largely owing to good performance of agriculture (+7.8%), manufacturing (+7.7%), and services (excluding trade). At the same time, rates of growth decelerated virtually in all sectors of the economy. In the environment of negative real wage growth and decelerating lending by banks, the domestic demand is driven only by money remittances of migrants and budget spending that was mainly channelled to cover current expenditures. The investment activity has not yet recovered due to the prolonged adjustment of Armenia's development model that followed the crisis of 2008/2009, incomplete execution of capital budget expenditures, and lower FDIs. Yet, the inflation was tightly controlled with the annual price growth in 2012-2014 averaging at below 4%.

Decelerating rates of domestic demand growth had a significant relevant impact on imports that, combined with recovery of export growth rates<sup>8</sup> and remittances of migrants, had a positive effect on the CA balance. For the first time starting from 2007, the CA deficit dropped to the single-digit level at 8.4% of GDP in 2013 and 8% of GDP in 2014 (against 11.2% of GDP in 2012).

During the crisis of 2008-2009, the Government of Armenia expanded the budget deficit to implement counter-cyclical policies. In subsequent years, the government consistently reduced its spending to bring down the budget deficit. Higher revenues starting from 2011 and continued Government spending cuts helped reduce the budget deficit to 2.8% of GDP in 2011 and further to 1.5% in 2012. In 2013 and 2014, the budget deficit grew respectively to 1.7% and 2.0% of GDP due to accelerated growth of expenditures combined with lower growth of revenues.

The budget of RA continues to face the challenge of low tax collection from domestic economy (22% of GDP in 2014) and high burden on the pension fund. In 2012, the Government initiated reforms in the area of taxation of private individuals to boost revenues of pension funds that resulted in higher budget revenues. The composition of taxes generates risks: taxes on private individuals constitute one third of tax revenues, while 40% of total budget revenues come from the VAT, much of which is generated by imports of goods and services. Lower money remittances will result in weaker domestic demand and imports. According to some preliminary estimates of the Manager, the budget deficit can reach 3.7% of GDP in 2015, and that budget deficit expansion is acceptable taking into account the need to maintain employment and stimulate economic growth.

The significant external debt limits the space for the budget manoeuvre in the medium-term perspective. At end-2014, the government external debt of the Republic of Armenia, including the Central Bank's debt, was US \$3.9 billion or 36.1% of GDP. With the domestic debt taken into account, the government debt to GDP exceeded 41% of GDP as at 1 January 2015. In the first six months of 2015, to ensure a smooth budget process, Armenia issued its Eurobonds in the amount of US \$500 million, part of which (US \$200 million) was used to repay debt. Dram depreciation at end-2014 led to worsening of the external debt to GDP ratio, which exceeded the national ceiling of 50% in 2015. Under the national external debt management strategy, it will call for lowering the budget deficit of RA over the period of 2016-2018 to below 3% of GDP from the level of 2014 that will help

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<sup>8</sup> For instance, good performance of agriculture in 2014, in particular in the agro-processing sector related thereto, has a positive effect on exports of finished food products. Combined with good performance of exports of precious stones and precious metals, that growth off-set the drop in exports of mineral products. As a result, the foreign trade deficit in 2014 went down to 26.6% of GDP compared to 28.7% of GDP in 2013 owing to continued export growth at 2.7% per year, while import growth was only 0.4%.

stabilise the level of external debt, but limit the scope of using the budget multiplier to boost economic growth.

At the same time, the high share of borrowing on concessional terms in the structure of external debt results in a relatively smooth external debt repayment profile. In 2014, the level of external debt service somewhat increased, exceeding 3% of GDP or 8% of export proceeds and money remittances. According to some preliminary estimates of the Manager, the level of external debt service in subsequent years will not exceed 10% of export proceeds and current transfers.

In 2014, the overall gross external debt level was around 78% of GDP, but—according to the Manager’s preliminary assessment—this ratio is likely to exceed 90% in 2015 following the Eurobond issue and dram depreciation. Further expansion of borrowing on market terms can jeopardise the debt sustainability, which will greatly depend on the ability of primarily enterprises and banks to refinance their debt<sup>9</sup>.

In spite of the worsening debt position of Armenia, the impact of the loan on the country’s debt sustainability is estimated as insignificant. If provided, the loan of US \$40 million will result in government external debt growth by 1.2% and an increase in the external debt to GDP ratio by 0.5% of GDP<sup>10</sup>. Taking into account the significant grace period and low price of the debt, that will not have a significant impact on debt sustainability and will not generate a sizeable burden for the budget.

### **3.1.2. Structural Constraints for Sustainable Growth**

The pre-crisis growth model of Armenia’s economy turned out to be extremely vulnerable to the crisis: in 2003-2008, over 90% of GDP growth was generated by construction and services. The global crisis started with declining capital inflows, money remittances and external demand that resulted in economic recession and disclosed imbalances in the GDP structure and inefficiencies in investments. Thus, Armenia was faced with the deepest GDP decline in the region, which reached 14.1% in 2009. It took Armenia 4 years to recover the pre-crisis level of GDP. The inefficiencies inherent in the growth model lead to accumulation of toxic assets in the real estate sector that is a significant constraint to the country’s investment capacity. Moreover, trends in construction will be having a negative effect on the overall economic growth.

Despite the macroeconomic stabilisation measures and a range of structural reforms implemented, the model is still extremely vulnerable to external shocks. The key factor of economic growth is final consumption supported with cash inflows from abroad, which can be generated either through expansion of external debt or through money remittances of migrant workers. In the long run, both of these channels cannot be factors of sustainable economic growth. Expansion of external debt will result in growth of debt service payments and, thus, will negatively affect the national income. Money remittances largely depend on economic growth in major labour recipient countries. Taking into account the high degree of labour migration concentration—the Russian Federation accounts for 90% of that—Armenia’s economic growth increasingly depends on economic developments in Russia. Declining money remittances will lead to lower GDP, as well as higher poverty, while the high poverty rate already poses a structural challenge<sup>11</sup>.

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<sup>9</sup>The share of the private sector in gross external debt was 53.5% of GDI in 2014.

<sup>10</sup>Including dram depreciation at end-2014.

<sup>11</sup>In spite of income growth in 2000-2014, the poverty rate (32% in 2014 based on the national poverty line definition) and the unemployment rate (16.2% in 2013) are still high. The economy is unable to generate a sufficient number of jobs to contain migration and Armenia would maintain its status of a labour exporter and would be unable to reduce its dependence on money remittances if no policies are taken to develop domestic production and improve the labour market and the quality of education.

Negative investment trends observed over the post-crisis period is the factor that maintains the existing economic model. In 2009-2014, the contribution of investment to GDP was negative. As at end-2014, the share of investment in GDP was below 20% against nearly 40% in the pre-crisis year. The low level of investment results in lack of sources for creating new jobs in the medium-term perspective, *inter alia* in priority sectors of the economy.

In spite of improved ranking of the country in the WB Doing Business report, investment growth is greatly constrained by restrictions in small and medium business creation and development that leads to a high unemployment rate in Armenia. According to the WB, the employment rate in Armenia is significantly lower than in most European countries: 53% compared to the average rate of 60% in Europe. Although the GDP growth rates have recovered, the unemployment rate continues to be high at 18% that is above the regional average.

Another factor is insufficient development of infrastructure that results in higher transportation time and costs. According to the WEF Global Competitiveness Report for 2013-2014, Armenia ranks the 80<sup>th</sup> of 148 countries by the quality of its infrastructure, and the country's business community sees the underdeveloped infrastructure as a key barrier to business development (we could be speaking about weak institutional capacity in general). The level of state investment in infrastructure is low, making 2% of GDP in 2013<sup>12</sup>. Further expansion of budget spending on capital construction, including infrastructure projects, calls for further reforms in public finance management, *inter alia* improvement of tax collection. Private sources to finance investment growth are limited. The inflow of direct investment has been consistently going down since 2009 and was 3.5% of GDP in 2013-2014. The deterioration of the economic situation at end-2014 significantly narrowed the capacity of the banking system to finance investment.

The level of development of the financial system is another factor hampering the country's social and economic development. Despite the progress achieved—credit to the economy exceeded 44% of GDP in 2014—Armenia's financial system is lagging in its development, in particular from the institutional standpoint, behind those of developed countries. The country ranks the 99<sup>th</sup> of 144 countries covered by the WEF rating. Improved access to credit, in particular for small and medium businesses, capital market development, de-dollarization of the economy—67% of total loans and 72% of all deposits were denominated in foreign currency in 2014,—and lower interest rates should remain the priorities, but with the difficulties associated with maintaining a sustainable balance of payments and with volatility of the exchange rate, this task calls for structural solutions.

## 3.2. Agriculture in RA

Agriculture is a key sector of RA economy. In the mid-1990s, agriculture held a dominating position among sectors of the economy generating 63% of GDP and 37% of employment<sup>13</sup>. In 2013, the share of agriculture was 21% of GDP and that of agro-industry was 29% of GDP. Around 36%<sup>14</sup> of the population—not taking into account those employed in agro-industry—are engaged in agricultural production. Agricultural output largely dropped in the part of plant products, which accounts for about two thirds of gross agricultural output.

Factors contributing to lower plant product output in Armenia. The landscape of Armenia is represented by mountains and narrow valleys characterised by a high degree of aridity. Most of the soils in Armenia are steppe ones, including chernozems, flood land soils, and flood land marsh soils

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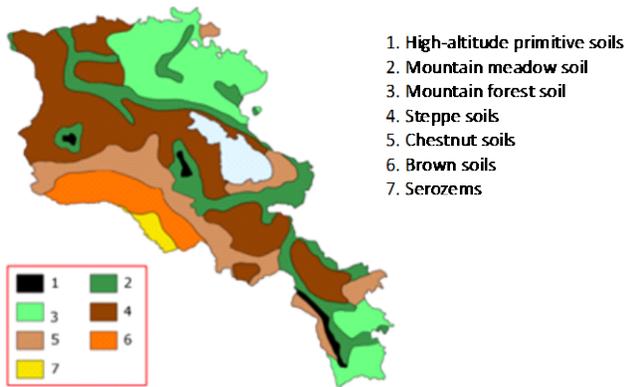
<sup>12</sup> Source: Armstat, calculations of the Manager

<sup>13</sup> Data of the National Statistical Service as at end-1998.

<sup>14</sup> Data of the National Statistical Service as at end-2013.

(Figure 1). A large number of rare plant and animal species and nearly half of Armenian flora are concentrated in the steppe<sup>15</sup>.

Figure 1. Soils of the Republic of Armenia



Source: UNFCCC Second National Communication

The process of desertification has impacted a large part of Armenia’s territory to a varying degree<sup>16</sup>. Over 1973-2003, 140,000 ha of plough land and 300,000 ha of hay and pasture fields were withdrawn from agriculture owing to soil erosion and slips in Armenia; out of 114,000 ha of eroded land to be reclaimed, about 3.5 % have been restored<sup>17</sup>. With plough lands shrinking and efficient water resource management called for, Armenian agriculture and irrigated arable farming become vulnerable to climate change<sup>18</sup>. By 2030, the moisture content of soil is expected to decline by 10-30 %, access of various crops to moisture – by 7-13 %, while water shortage will increase by 25-30%<sup>19</sup>. As shown in the map in Annex 2, environmental changes will affect irrigation in Armavir, Ararat, Kotaik, Vayots Dzor, and Shirak *marzes*<sup>20</sup> most of all.

As a result of the agrarian reform of the 1990s, small households with average land holding of about 1.4 ha dominate in the sector. They are engaged in both crop growing and livestock farming. Small farms are faced with insufficient state support of agriculture, lack of fuel, fertilizers, quality seeds, knowledge, and financial resources. Irrigation is one of the key factors of crop yield in the agricultural sector of Armenia (Figure 2). In 2013, the crop area in Armenia was 319,100 ha. Currently, 207,600 ha are effectively equipped for full or partial irrigation control: 133,400 ha are managed by WUAs users, the rest are community lands located far from irrigation networks and watered from local water sources.

<sup>15</sup> United Nations Framework Convention on Climate Change (UNFCCC). 2010. *Second National Communication*. Republic of Armenia Ministry of Nature Protection.

<sup>16</sup> National Report on Implementing the UN Convention to Combat Desertification in Armenia, 2000.

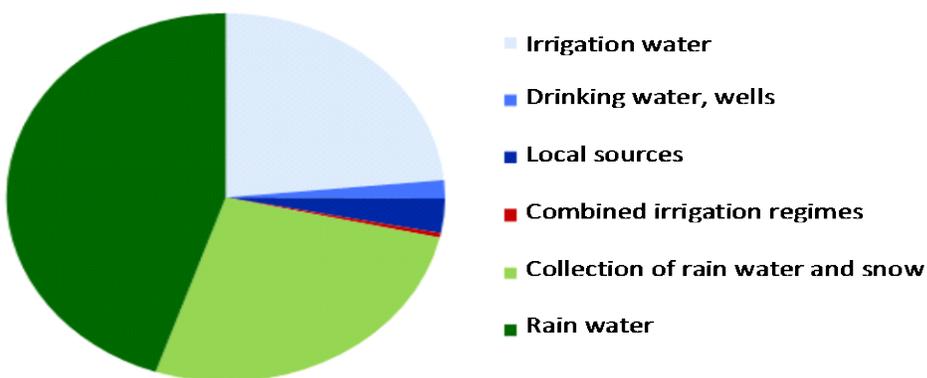
<sup>17</sup> According to 2003 data.

<sup>18</sup> FAO: AquaStat Survey, 2008.

<sup>19</sup> World Bank. June 2012. Climate change and agriculture country note.

<sup>20</sup> A *marz* is an administrative and territorial unit of RA (region).

Figure 2. Consumption of water in agriculture of RA, by sources, 2010 (%)



Source: National Statistical Service of RA

The irrigation sector in Armenia is faced with severe shortage of investments for better water and energy efficiency. Over the period after the collapse of the Soviet Union (1991), its irrigation system was on the edge of a break-down as a result of lack of technical maintenance and operation, extremely insufficient state financing, and insolvency of small land owners, who had become new owners of their land plots. At present, the gap between the needs of the farming sector and the capacity of the country's irrigation system continues growing and the level of water losses in irrigation canals average from 37 to 44% depending on canal type. The need for capital investment is reinforced by the effects of climate change and growing water consumption as farmers try to switch to growing more valuable crops.

In the mid-1990s, a long-term national programme to restore and restructure the irrigation and drainage network was adopted in RA and was supported by donors. For example, over the period of 1994-2013 the WB supported programmes with a focus on technical rehabilitation and building the institutional capacity of Armenia's irrigation system. The following results were achieved through their implementation:

- Creation of 54 WUAs, which cover all the irrigated lands of Armenia;
- Rehabilitation and improvement of security systems at 44 dams;
- Reduced operating costs and improved cost recovery up to 45.2 % (from 8 % in 2000);
- Larger area of irrigated land, which expanded from 112,300 ha to 128,860 ha;
- Reduced energy consumption—by US \$3.4 million per year;
- Equipment of the irrigation system with water meters.

The situation, however, became worse due to the fact that the large-scale Millennium Challenge Corporation programme (MCC)<sup>21</sup> for 2006-2011 was not implemented even by half (Table 1).

<sup>21</sup> Millennium Challenge Corporation is the US government foreign aid agency relying on innovative mechanisms.

Table1. Planned and actual performance under Millennium Challenge Corporation programme (MCC)<sup>22</sup> in the irrigation sector of Armenia in 2006-2011

<b>Components of Millennium Challenge Corporation programme</b>	<b>Planned</b>	<b>Actual</b>
Rehabilitation of main canals, km	200	36
Construction of flow irrigation systems, units	18	5
Rehabilitation of pump units, units	68	17
Rehabilitation of on-farm canals, km	500	250

Only one third of crop area is currently irrigated, while the infrastructure of Armenia's irrigation system needs rehabilitation and modernisation:

- main canals: 400 km need rehabilitation;
- secondary canals: 1,468 km need rehabilitation;
- on-farm networks: the average canal life is 25 years and around 500 km currently need rehabilitation; and
- pump unit useful life outlasted: one quarter of the existing networks can switch to flow irrigation, while the rest require rehabilitation.

In 2011, based on calculations prepared by Vorogum-Jrar organisation, the total immediate need for capital investment in irrigation systems was estimated at US \$172.6 million, including US \$22.7 million to switch from mechanical to flow irrigation, US \$11.2 million for pumping equipment modernisation, and US \$138.7 million for main, secondary, and on-farm irrigation network rehabilitation and modernisation.

The institutional development programmes implemented in the sector so far have generated their positive effects, but the process of institutional reforms should be uninterrupted. Up to now, the support has focused on legal and administrative issues, while the need to improve management procedures remains unaddressed:

- WUA staff do not operate efficiently enough;
- Farmers still remain improperly informed about their rights and responsibilities and are not actively involved in WUA management;
- As WUAs strengthen, a range of supporting institutions should be created;
- Audit and dispute resolution commissions of WUAs are not active enough; and
- WUAs are poorly equipped for operation and technical maintenance of the irrigation infrastructure.

<sup>22</sup> Millennium Challenge Corporation is the US government foreign aid agency relying on innovative mechanisms.

### 3.3. Project Description

#### 3.3.1. Project Objectives and Components

The Project covers irrigation system rehabilitation and institutional capacity building in different regions of the Republic of Armenia. The key objectives under the Project include irrigation system modernisation to achieve the following ultimate goals:

- improved efficiency of irrigation systems;
- larger area of irrigated land;
- management capacity building and improved equipment capacity of water user associations (WUAs), creation of WUA Federations.

The project consists of four components to be implemented over the period of 2016-2020.

#### Component 1. Switching from mechanical to flow irrigation

The objective of this component is to reduce the costs related to supply of irrigation water by replacing mechanical irrigation (using pumps) with flow irrigation. At present, it is possible to create 18 flow irrigation systems that would help take pump units out of operation. Based on some calculations, 8 flow irrigation systems with an internal rate of return of at least 21% have been selected for the Project (Table 2).

Thus, this component of the Project covers design, designer supervision, technical supervision, and construction of 8 flow irrigation systems totalling around 70.4 km.

Table 2. Flow irrigation systems selected for construction under the Project<sup>23</sup>

No	Name of flow irrigation system	WUAs	Length of section restored (m)	Actual irrigated area	Additional area
			m	ha	ha
1	5 <sup>th</sup> distributor of Artashat canal	Masis	6,000.0	280.0	100.0
2	Nor Kharberd	Masis	9,500.0	180.0	130.0
3	From the Azat river to discharge canal of the 1 <sup>st</sup> stage of Mkhchyan pump unit	Azat	1,300.0	480.0	50.0
4	Ptghni	Jrvezh-Dzoragyukh	12,000.0	105.0	145.0
5	Nor Gehi and Nor Artamet	Nairi	6,000.0	140.0	92.0
6	Agrichi	Martuni	30,000.0	500.0	706.0
7	Bardzruni	Vayk	4,300.0	30.0	70.0
8	Tsitsernakaberd	Yerevan	1,300.0	111.5	80.0
	<b>Total</b>		<b>70,400.0</b>	<b>1,826.5</b>	<b>1,373.0</b>

Source: Project FS

<sup>23</sup> The table includes calculations, which may be adjusted as the project implementation progresses.

## Component 2. Rehabilitation of main and secondary canals

Main canals, representing the first step of water intake from natural water sources, and secondary canals hold a strategic position in the irrigation sector. The efficiency of the whole irrigation system depends on their reliable operation. The total length of main canals of RA major irrigation systems is around 541 km and that of secondary canals is 2,627 km.

The criterion for selection of main and secondary canals to be covered by the Project was improvement of the economic efficiency of irrigation systems. Thus, the Project covers only those canals (Tables 3-4), which:

- are in a critical technical condition,
- will facilitate reduction of operation and maintenance costs and losses of irrigation water, and
- will result in improved security of neighbouring settlements.

Therefore, this component covers design, designer supervision, technical supervision, construction, and rehabilitation of:

- around 8.1 km of the total length of 4 main canals;
- around 54.1 km of the total length of secondary canals at 22 selected WUAs.

Table 3. Main canals selected for rehabilitation and construction under the Project<sup>24</sup>

No.	Name	RA marz	Length of section restored (m)	Actual irrigated area
			m	ha
1	Artashat main canal	Artashat	1,400	20
2	Arzni-Shamiram	Kotaik	2,475	30
3	Lower Razdan	Khoy	3,500	11
4	Kotaik	Kotaik	800	208.3
<b>Total</b>			<b>8,175</b>	<b>259.3</b>

Source: Project FS

Table 4. Secondary canals selected for rehabilitation and construction under the Project<sup>25</sup>

No.	Name	WUAs	Length of section restored (m)	Actual irrigated area	Additional area
			m	ha	ha
1	Sayat-Nova	Masis	4,500.0	410.0	100.0
2	Arbat	Masis	1,800.0	95.0	20.0
3	Margara canal	Merdzapnya	5,000.0	1,488.0	160.0
4	Terminal section of Mrgashat canal	Merdzapnya	2,800.0	100.0	100.0
5	Garni main canal	Garni-Gegard	6,000.0	800.0	220.0
6	Shah-Arskiy canal	Vagharshapat	2,500.0	1,075.9	170.0

<sup>24</sup> The table includes calculations, which may be adjusted as the project implementation progresses.

<sup>25</sup> The table includes calculations, which may be adjusted as the project implementation progresses.

7	Discharge canal of Aratashen system	Aknalich	2,300.0	90.0	110.0
8	Discharge canal of Araks-Jrarat	Aknalich	2,200.0	47.0	125.0
9	Lower Razdan canal, 2 <sup>nd</sup> stage, 5 <sup>th</sup> branch	Khoy	2,800.0	140.0	150.0
10	Distributor R-6	Shenik	1,400.0	276.0	70.0
11	Distributor R-4	Shenik	2,700.0	272.0	43.0
12	Distributor MH-7	Shenik	700.0	526.8	20.0
13	Right-bank Kasakh canal	Kasakh	1,500.0	300.0	100.0
14	Goht canal	Garni-Gegard	1,500.0	400.0	60.0
15	Left-bank Kasakh canal	Nairi	3,200.0	10.0	300.0
16	Dvin canal	Artashat	300.0	468.0	0.0
17	Artashat canal No.49	Artashat	1,000.0	158.8	0.0
18	Atsik distributor No.10	Armavir	3,500.0	145.0	65.0
19	Distributor MH-3	Shenik	1,500.0	87.0	35.0
20	Voskevaz main canal	Parpi	3,400.0	103.0	184.9
21	Left-bank branch of the 2 <sup>nd</sup> stage of Zeytun-Akhtanak water pump unit	Noemberyan	2,300.0	55.0	60.0
22	Left-bank branch of the 3 <sup>rd</sup> stage of Zeytun-Akhtanak water pump unit	Noemberyan	1,200.0	310.0	0.0
<b>Total</b>			<b>54,100.0</b>	<b>7,357.5</b>	<b>2,092.9</b>

Source: Project FS

### Component 3. Modernisation of WUA on-farm distribution network

In some cases, the on-farm distribution irrigation system in Armenia is unable to satisfy the current needs of agriculture. There is a total of 13,670 km of on-farm canals operated in the country.

The Project covers on-farm networks, which are in a critical condition and characterised by high water losses and use of mechanical irrigation sources (Table 5). Their rehabilitation would enable reduction of both water losses and electricity consumption.

Thus, the Project includes design, designer supervision, technical supervision, and rehabilitation of around 277.8 km of on-farm canals at 27 selected WUAs.

Table 5. On-farm canals selected for rehabilitation and construction under the Project<sup>26</sup>

No.	Region	WUAs	Length of section restored (m)	Actual irrigated area	Additional area	Investments
			m	ha	ha	'000 US \$
1	Ararat	Araks	8,500.0	797.0	170.0	887.4
2	Ararat	Masis	30,450.0	915.0	570.7	2,630.8
3	Ararat	Azat	7,000.0	178.0	142.2	708.7
4	Ararat	Artashat	12,100.0	1,055.7	395.0	1,109.7
5	Ararat	Vedi	9,200.0	631.5	283.3	788.5
6	Ararat	Ararat	16,700.0	1,590.0	675.0	1,536.1
7	Armavir	Musaler	5,300.0	245.7	230.3	561.6
8	Armavir	Vagharshapat	5,900.0	910.8	161.9	532.2
9	Armavir	Aknalich	14,675.0	277.0	113.9	700.7
10	Armavir	Khoy	21,590.0	1,142.0	553.2	1,783.6
11	Armavir	Armavir	13,750.0	1,092.1	583.5	1,439.8
12	Armavir	Sev-Jur Akhtamar	8,100.0	488.0	338.2	694.3
13	Aragatsotn	Shenik	11,900.0	359.4	334.9	1,098.9
14	Aragatsotn	Merdzapnya	1,500.0	494.0	105.9	342.2
15	Aragatsotn	Kasakh	800.0	100.0	21.3	83.3
16	Aragatsotn	Ashtarak	2,000.0	173.0	35.7	192.2
17	Aragatsotn	Parpi	6,400.0	392.0	411.9	491.0
18	Aragatsotn	Amberd	1,360.0	77.0	75.7	103.5
19	Aragatsotn	Shamiram	4,900.0	192.5	59.2	152.4
20	Aragatsotn	Talin	9,500.0	140.0	113.0	365.8
21	Kotaik	Garni-Gegard	8,010.0	1,274.0	192.0	641.7
22	Kotaik	Jrvezh-Dzoraghbyur	22,000.0	474.2	90.9	554.1
23	Kotaik	Nairi	7,150.0	522.8	122.2	434.9
24	Kotaik	Egvard	7,500.0	481.6	264.2	196.4
25	Razdan	Razdan-Jur	17,710.0	458.7	433.2	925.5
26	Gegarkunik	Martuni	11,000.0	602.0	383.6	862.4
27	Syunik	Megri	12,810.0	220.0	106.0	440.6
	<b>Total</b>		<b>277,805.0</b>	<b>15,283.9</b>	<b>6,966.7</b>	<b>20,258.4</b>

Source: Project FS

<sup>26</sup> The table includes calculations, which may be adjusted as the project implementation progresses.

#### **Component 4. Project management; WUA institutional capacity building and piloting WUA Federations**

This component consists of 2 parts:

##### **Component 4.1. Project management**

It includes ensuring support to the project implementation unit in its on-going coordination of the Project implementation, including financial management, procurement, accounting, targeted use of funds, monitoring and performance assessment, cooperation with beneficiaries, preparation and filing of financial and other reports provided for in the Agreement on Project Reporting, engagement of external auditors, and compliance with applicable policies and procedures under the Project.

##### **Component 4.2. WUA institutional capacity building and piloting WUA Federations**

The key objective of this subcomponent is to ensure uninterrupted implementation of the institutional reforms launched by other donors, improve the responsibility of water users and efficiency of WUA management. In the process of the Project preparation, the team reviewed institutional aspect of the irrigation sector and identified its key challenges. Based on that, a package of measures was developed aiming at:

- improving collection of fees for irrigation water;
- improving the legislative framework for water sector management entities;
- developing WUAs management bodies, including the institute of representatives, administrative councils, and various commissions;
- improving the equipment capacity of WUAs;
- improving the quality of irrigation services;
- promoting implementation of new irrigation technologies; and
- improving water users' awareness of WUAs.

Thus, this component of the Project includes:

- a) Building the technical capacity of WUAs and WUA federations, *inter alia* by introducing the SCADA system of monitoring electricity consumption and automatic water metering equipment for pressure water systems and open canals for major water users, calibration of the power system of pump units, and procurement of 3 excavators and 2 cranes;
- b) Advising WUAs and WUA federations on legal, financial, institutional, and other issues;
- c) Training WUAs staff, including water metering and distribution experts;
- d) Creating and disseminating awareness-raising video films; and
- e) Piloting new irrigation technologies (drip, trickle irrigation) on around 400 ha of commanded areas of 12 communities of Kaghtsrashen flow irrigation system.

### **3.3.2. Current Project Status**

In June 2013, the Fund Council approved the Manager's Appraisal Report on the Preliminary Application of the Republic of Armenia for an investment loan to be provided by the EFSD in the amount of US \$40 million to implement the Irrigation System Modernisation and Institutional Capacity Building Project<sup>27</sup>.

Having received the approval by the Council, the Manager continued working on the Project. In particular, an Agreement was signed on 5 December 2013 between the WB and EDB on cooperation

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<sup>27</sup> Letter of the Ministry of Finance of the Republic of Armenia No. 1215-51-214 of 16 April 2013, with the investment project conceptual framework attached.

between the two institutions in the process of preparing and implementing the Irrigation System Modernisation and Institutional Capacity Building Project. Under that Agreement, the WB is to prepare the project based on the Manager's request with support in the form of a grant of the Capacity Development Trust Fund for the Countries of Europe and Central Asia<sup>28</sup> (US \$495,000), while the Manager undertakes to comply with applicable social, environmental, procurement, and financial management policies of the WB in the process of implementing the EFSD project, as well as engage the WB as a consultant to monitor implementation of the above policies.

In May 2014, a Grant Agreement between the WB and the Republic of Armenia was signed to support the Project preparation. The following documents have been prepared so far:

- Project Feasibility Study;
- Report on Institutional Capacity of Irrigation Sector;
- Guidelines on Application of WB Social and Environmental Policies;
- Guidelines on Application of WB Involuntary Resettlement Policies; and
- Project Monitoring and Appraisal Plan.

It should be noted that, in the framework of the third phase of its programme, the WB has launched implementation of a parallel irrigation project. The EFSD and WB projects are complimentary and serve as a follow-up to the programmes financed earlier. The two projects are coordinated through the following channels: (a) joint missions to Armenia and working contacts with the WB project manager enable sharing experience and ensuring maximum cooperation, (b) the State Committee of Water Management and one and the same project implementation unit are responsible for implementation of both projects that enables coordination of efforts to avoid duplication.

### **3.3.3. Project Financing Needs**

The Project financing needs (Table 6) have been defined based on cost calculations for construction work related to the irrigation system modernisation (prepared by “HGSN” LLC) and WUA institutional capacity building activities (prepared by “VISTAA Plus” LLC).

The cost of construction projects was defined by the consultant (“HGSN” LLC) based on the unit cost of main types of construction work (for canals built with ready-made reinforced concrete conduits and L-shaped reinforced concrete blocks of all types and sizes, open cast-in-situ or reinforced concrete canals, covered steel and polyethylene pipes of various diameter). The unit cost was calculated based on the information published in the recent bulletin of the Ministry of Urban Planning of RA. In addition to main types of work, the consultant also used relevant ratios to include into the calculation the cost of all secondary work (earthwork, preparatory work, insulation, construction of structures, making expansion joints, and other types) and all standard accrued items estimated as a percentage, such as overhead expenses, temporary buildings and structures, and winter appreciation.

The cost of the institutional component was determined by the consultant (“VISTAA Plus” LLC) relying on the cost estimate prepared based on the unit cost for relevant expense items.

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<sup>28</sup> The Capacity Development Trust Fund for the countries of Europe and Central Asia (ECAPDEV) was created in 2011 with the resources provided by the Government of the Russian Federation and is managed by the WB. The objective of providing grants is to ensure better quality of investment project preparation and build the institutional capacity of project implementation agencies.

Table 6. Project financing needs, by years, US \$ million

Component	2016	2017	2018	2019	2020	Share	Total
1. Switch from mechanical to flow irrigation	399.1	3,589.6	4,028.7	4,028.7	25.3	24.1%	12,071.4
2. Rehabilitation of main and secondary canals	335.8	3,633.5	4,078.5	4,078.6	21.9	24.3%	12,148.3
3. Modernisation of on-farm irrigation systems of WUAs	641.7	6,126.8	4,925.3	4,925.3	3,955.9	41.2%	20,575.0
4. Project management. Building the institutional capacity of WUAs	1,412.8	2,250.6	973.6	319.2	249.1	10.4%	5,205.3
<b>Total</b>	<b>2,789.4</b>	<b>15,600.5</b>	<b>14,006.1</b>	<b>13,351.8</b>	<b>4,252.2</b>	<b>100%</b>	<b>50,000.0</b>

Source: Project FS

### 3.4. Project Economic Efficiency

The economic efficiency of the Project was assessed by the Consultant based on comparing the “project scenario” and “no change” scenario for each component. For the purposes of making the calculations, all economic profits and expenses by components were added up and efficiency indicators were calculated for the time horizon of 15 years. Table 8 presents consolidated indicators for the Project components.

The following direct effects of Project implementation were taken into account:

- Net savings of electricity: for new flow irrigation systems – the amount of past electricity costs; for modernised canals – electricity savings due to lower water losses in canals;
- Net savings of operation and maintenance costs;
- Expanded irrigated area;
- Improved yields of agricultural crops by regions of Armenia; and
- 10% gradual growth of net profits of farmers owing to more reliable water supply.

Annual electricity savings of 14.37 million kWh start after completion of all construction work, i.e. 5 years after the start of construction. In money terms, that makes around US \$1.26 million. About 50% of the amount will be generated owing to the shift from mechanical to flow irrigation systems. Annual savings of operation and maintenance costs of the irrigation systems will be US \$0.67 million after the Project is completed (Table 7).

Table 7. Annual net cost savings of irrigation systems after Project completion

Cost savings related to:	US \$ million
– electricity	1.26
– operation and maintenance costs	0.67
<b>Total</b>	<b>1.93</b>

Source: Project FS

The irrigated area will expand as a result of the Project implementation by 10,432.6 ha, and of all the arrangements transformed in the framework of the Project, only 4 main and 3 secondary canals do not contribute to the effect.

It should be noted that the approach presented in the FS does not account for potential switch to more valuable crops; as well as gradual growth of irrigation system maintenance costs and water losses in the “no change” scenario.

Table 8. Project efficiency indicators

<b>I. Switch from mechanical to flow irrigation</b>	
Capital investment, US \$ million	12.07
Annual electricity savings, kWh million	7.31
Annual electricity savings, US \$ million	0.66
Savings of operation and maintenance costs, US \$ million	0.11
Actual irrigated area, ha	1,826.5
Additional irrigated area, ha	1,373.0
Number of beneficiaries	21,920.0
IRR	32.2%
NPV, US \$ million	5.22
<b>II. Rehabilitation of secondary canals</b>	
Capital investment, US \$ million	12.15
Annual electricity savings, kWh million	0.71
Annual electricity savings, US \$ million	0.06
Savings of operation and maintenance costs, US \$ million	0.09
Actual irrigated area, ha	7,357.5
Additional irrigated area, ha	2,092.9
Number of beneficiaries	26,908.0
IRR	65.5%
NPV, US \$ million	6.08
<b>III. Modernisation of on-farm irrigation systems</b>	
Capital investment, US \$ million	20.57
Annual electricity savings, kWh million	6.35
Annual electricity savings, US \$ million	0.54
Savings of operation and maintenance costs, US \$ million	0.47
Actual irrigated area, ha	15,283.9
Additional irrigated area, ha	6,966.7
Number of beneficiaries	65,554
IRR	73.4%
NPV, US \$ million	19.58

Source: Project FS

Canals and systems with the highest internal rates of return were selected for the purposes of the Project: the minimum IRR for selecting sites under the first components was 21.2%, that under the second component – 34.3%, and the third component – 32.7%. In addition, as some secondary and on-farm canals covered by the Project are in a critical condition, even small investments generate very high savings of electricity and a significant reduction of water losses and, thus, high IRRs.<sup>29</sup>

The net present value of the whole Project is US \$30.88 million. This indicator characterises net benefits for RA generated by the Project in value terms, i.e. it is the sum of cost savings and growth of farmers' incomes discounted to the current period.

The number of Project beneficiaries will be 114,382 people. The range of Project beneficiaries will include water supplying organisations, including Jrar CJSC (WSA), WUAs, and the State Committee of Water Management, as well as farmers engaged in crop farming on areas commanded by

<sup>29</sup> As all the main canals selected for the Project are in a critical condition, no IRR calculations were made for them.

the selected irrigation systems. The number includes farmers (immediate beneficiaries) and their family members that is a conservative estimate based on average indicators for beneficiaries located on actually irrigated lands.

### **3.5. Social, Economic, and Anti-Crisis Effects of the Project**

#### **Improved employment and lower poverty rates in rural areas**

The Project involves direct creation of new temporary jobs for the period of construction work. In particular, around 14 contracts totalling about US \$41 million are to be executed for construction work under the Project in different regions of Armenia that will help employ rural population not otherwise employed and mitigate effects of the current economic crisis.

In addition, as the Project aims at improving the efficiency and stability of irrigation water supply and expanding the irrigated area, these measures will improve the attractiveness of the agricultural sector and may have a positive effect on permanent employment. For instance, the FS shows that net average profits of farms generated by additional irrigated area under the component of switching from mechanical to flow irrigation are estimated at US \$432 per 1 hectare. Combined with improved employment, that can become one of the factors contributing to lower poverty rates in rural areas.

#### **Budget efficiency**

– Higher tax revenues:

As the Project focuses on developing the agricultural production, tax revenues coming from the following sources are expected to grow: the personal income tax owing to higher incomes of beneficiaries and the land tax owing to expansion of the irrigated area by 10,432.6 ha.

– Lower spending on social assistance:

As the Project is to generate higher incomes for farmers and additional temporary employment at the stage of the Project implementation, this can be a factor contributing to reduction of Armenia's Government spending to pay unemployment benefits<sup>30</sup>.

– Subsidising water supply:

The Government of Armenia currently subsidises the difference between the fees collected by Water User Associations from farmers benefiting from irrigation water supply and the real cost of irrigation water. The real maintenance and operation costs include the cost of electricity (in case of mechanical irrigation), cost of water purchased from water supplying entities, and other operation and maintenance costs. If implemented, components 1-3 of the Project are to result in lower irrigation water supply costs that will also lead to lower objective needs for government subsidies.

#### **Improved balance of payment indicators**

Rehabilitation and modernisation of the irrigation system leads to improved efficiency in agriculture that, in its turn, can result in farmers' switching to produce with a higher added value. Therefore, the efforts generate a gradual growth of agricultural exports (natural juice, canned fruit and vegetables), import substitution, and, thus, better balance of payment indicators.

#### **Development of institutional and infrastructure framework of market economy**

The Project is designed to provide infrastructure for the sector, where private businesses prevail, that promotes further development of the market economy in Armenia and private investment inflows.

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<sup>30</sup> In Armenia, there is no unified system of unemployment benefits and benefits are paid to individual members of low-income households based on means testing. The basic amount of the benefit is 18,000 dram per month (around US \$45).

The Project also addresses issues of efficient WUA management, thus, building the institutional capacity of the irrigation sector.

### **3.6. Project Support by Government**

The Government of Armenia has initiated a number of institutional reforms and irrigation infrastructure development efforts to create an environment for sustainable and efficient agriculture regulated by market mechanisms and has fixed these initiatives in the following documents:

- Strategic Programme of Long-Term Development of RA for 2014-2025 (RA Government Resolution No. 442-T of 27 March 2014), including irrigation system modernisation, water supply improvement, and application of WUA joint management principles.
- RA Government Programme for 2012-2017 (RA Government Resolution No. 730-A of 18 June 2012 approved), specifying (paragraph 3.1.7.2.) the following priority areas for investment:
  - introduction of new water supply systems in rural areas;
  - construction of water reservoirs, irrigation infrastructure modernisation;
  - repair and reinforcement of key hydraulic engineering structures; and
  - proper operation and technical maintenance of existing facilities.

The proposed Project will further the efforts of RA Government in this direction.

### **3.7. Project Compliance with EFSD Mission Statement**

The Manager sees the Project as fully consistent with the EFSD mission statement. If implemented, the Project will contribute to improved economic and social sustainability of the Republic of Armenia, as well as better food security of the country (see Annex 1 for the Matrix of Project Compliance with EFSD Mission Statement).

As noted in the previous section, the Project will help improve employment, reduce the poverty rate in rural areas, raise the budget efficiency in Armenia, and improve balance of payment indicators. These effects are an integral part of the EFSD mission, which is to ensure sustainable development of the EFSD member states. The Project is also characterised by a moderate integration potential as

- the infrastructure created under the Project can facilitate foreign investment inflows from other CIS countries and creation of joint ventures with them.
- more regular and predictable water supply helps improve crop yield and expand exports. Mutual trade expansion is also possible at the investment phase: equipment, goods and services purchased under the Project will be supplied based on tenders, including international ones.

### **3.8. Project Financing Mechanism and Terms**

#### **Project financing mechanism**

The Borrower under the investment loan will be the Republic of Armenia, therefore the borrowed EFSD resources are a sovereign loan and make part of sovereign obligations of the Republic of Armenia. The Republic of Armenia will reflect the borrowed EFSD resources in its state budget (as a source of budget deficit financing and as budget expenditures to finance the National Investment Project), as well as make budget appropriations in the volume needed for servicing the EFSD loan.

The total amount of the Project financing to be provided by the EFSD is estimated at US \$40 million. The required Project co-financing by the Republic of Armenia is proposed to be set at US \$10 million (Table 9) in the form of:

- Exemption of taxes and other mandatory payments under contracts and operating expenses covered with Investment Loan proceeds,
- Co-financing of on-farm canal construction (under component 3 of the Project).

Table 9. Sources of Project financing and categories of expenses

Categories of expenses	US \$ million
<b>EFSD</b>	
– Goods, work, advisory services, training, and operating expenses under the Project (100%, except for expenses to be covered from the budget of the Republic of Armenia)	40
<b>Republic of Armenia</b>	
– Payment of taxes and other mandatory payments under contracts and operating expenses (100%)	10
– Co-financing under component 3 of the Project (10% of the cost of construction work less taxes)	
<b>Total:</b>	<b>50</b>

The responsibility for Project implementation and compliance with the terms of the loan agreement under the Project will be divided between executive government bodies and organisations of RA in the following way:

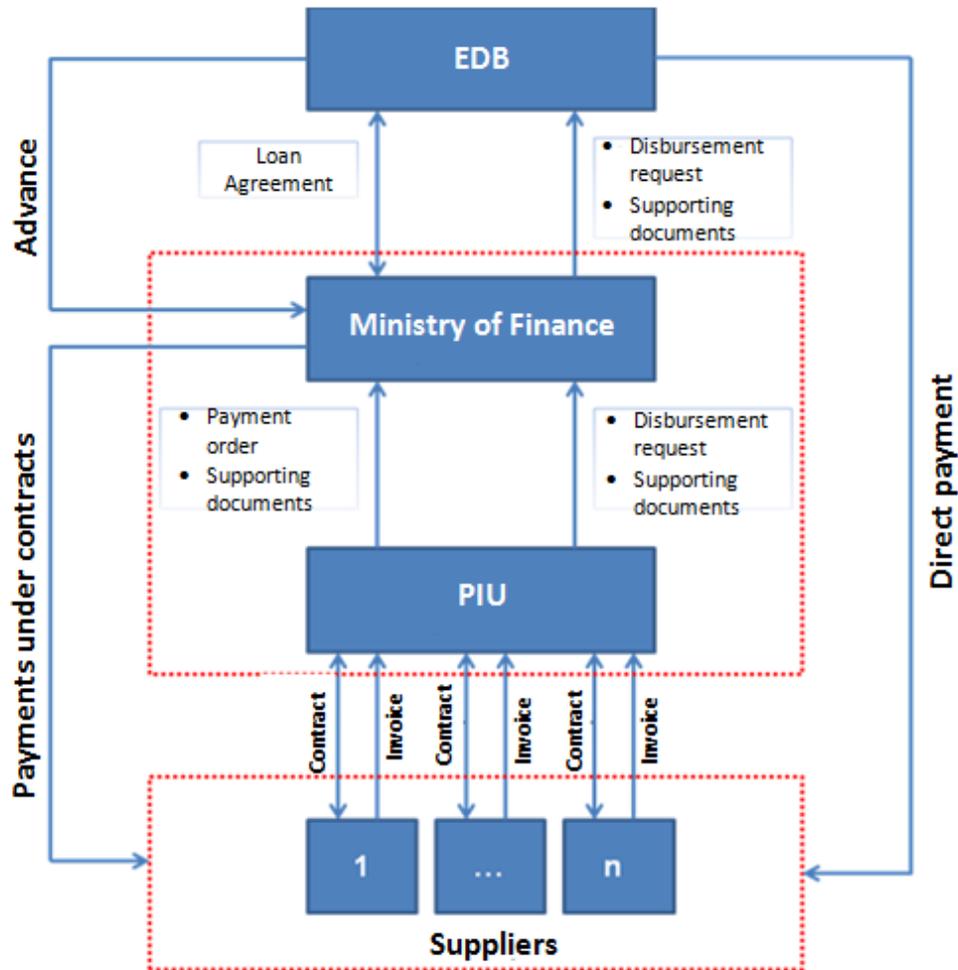
- the State Committee of Water Management of the Republic of Armenia is responsible for the overall management of Project implementation;
- the National Institution Water Sector Programme Implementation Unit, State Committee of Water Management, Ministry of Agriculture of the Republic of Armenia, is responsible for day-to-day coordination of Project implementation, including finance management, procurement, accounting, targeted use of funds, monitoring and performance assessment, preparation and filing of financial and other reports under the Project, engagement of external auditors, and compliance with applicable policies and procedures;
- the Ministry of Finance of the Republic of Armenia is responsible for:
  - a) opening and managing a Dedicated Account in the name of the PIU,
  - b) making full and timely Payments under the loan, as well as providing financing of the Project from the RA budget in a timely fashion.

Since the Project design includes no Project Company, the Manager recommends to assign the rights and responsibilities of the Ultimate Beneficiary established by the Regulation on the Use of Fund Resources for Providing Investment Loans to the Republic of Armenia.

The Manager proposes to provide the Investment Loan based on WB disbursement procedures<sup>31</sup> and using the following methods: an advance transferred to the account and direct payments to accounts of contracted suppliers on condition that supporting documents are provided to the Manager to confirm targeted use of funds. The project financing mechanism is presented in Figure 3.

<sup>31</sup> Disbursement Handbook for World Bank Clients, May 2006, with subsequent amendments and addenda; World Bank Disbursement Guidelines for Projects, 1 May 2006, with subsequent amendments and addenda.

Figure 3. Project financing mechanism



### Financing terms of investment loan

Owing to the high growth of external borrowing and vulnerability of the debt position to external shocks, a zero limit on non-concessional lending in the overall portfolio of external government and government guaranteed loans was agreed in the framework of the current IMF programme with RA. RA undertook the commitment not to raise loans and not to issue guarantees for loans, which can push the grant component of the portfolio down to a level below 30 %.

Based on the aforesaid and taking into account the need to comply with the requirement of the grant component of at least 30 %, the Manager proposes to establish the following financing terms for the requested Loan:

- interest rate: 2 % annual;
- risk premium: not applicable;
- front-end fee: 0.5 % of the loan amount;
- commitment fee: not applicable;
- maturity: 20 years, including a 10-year grace period (during which no principal repayments are to be made);
- requirement of Project co-financing by the Borrower: at least US \$10 million (20 % of the total Project cost).
- grant component: 30.79%.

### **3.9. Environmental and Social Impact Assessment**

According to EDB's Environmental and Social Responsibility Policy, the Project is classified under category B – a project with potentially significant environmental and social impacts of local nature, which are usually reversible and / or can be prevented. Under the Agreement between the Manager and the WB, WB environmental policies shall apply for the purposes of the Project. According to WB environmental policies, the Project is also classified under category B – the Project environment impacts are limited to the easement area, are short-term, and can be mitigated in the process of Project implementation.

WB operational policies will be followed during the Project implementation:

– 4.01. “Environmental Assessment”: The environmental impacts of the irrigation system modernisation project implementation will be minimal as most of the construction work is expected to be performed within the limits of the existing irrigation infrastructure. However, switch to flow irrigation will result in movement of part of water intake and affect distribution of water resources. But as one of the Project objectives is to ensure efficient water use, the Project has a capacity to ensure environment sustainability.

Guidelines on Application of WB Social and Environmental Policies were developed in the framework of the Project preparation. The guidelines include efficient measures to mitigate the environmental impact of the Project. At the stage of Project implementation, the Beneficiary must prepare an Environmental Management Plan (EMP) and follow it in the process of construction of infrastructure facilities.

– 4.12. “Involuntary Resettlement”: The need for land uptake or temporary restriction of land use is hardly likely to arise in the framework of Project implementation as rehabilitation of existing irrigation infrastructure normally does not generate such impacts, while construction of new pipelines is planned along existing lines. However, there is such a risk. In the framework of the Project preparation, Guidelines on Application of Involuntary Resettlement Policies were developed. The guidelines establish the principles of work in case of involuntary resettlement in the framework of the Project.

– 4.09 “Pest Management”: As a result of the Project implementation, crop cultivation will be restored on part of agricultural land that, in its turn, can lead to more extensive use of pesticides. There is no need to develop a Pest Management Plan in the framework of the Project, but the institutional component of the Project includes raising farmers' awareness of good pesticide application practices.

### **3.10. Monitoring Project Implementation**

The Manager proposes to perform Project monitoring and evaluation in accordance with EDB's monitoring procedures. The monitoring procedures will include collection of the following project reports:

– For each calendar six months: a project implementation progress report, a report on the progress in achieving Project monitoring indicators, a report on procurement plan implementation under the Project;

– quarterly: a report on sources and use of funds; a report on use of funds under project activities; a statement of the Dedicated Account; a financial status report; an equilibrium balance of the Dedicated account; a statement of expenses; primary accounting documents to confirm eligible expenses under contracts: for procurement of goods for the amount exceeding US \$300,000.0; performance of work for the amount exceeding US \$2,000,000.0; for consultant services for the amount exceeding US \$100,000.0; for hiring individual consultants for the amount exceeding US \$50,000.0.

The PIU will perform on-going monitoring of the Project, among other things, using the matrix of Project indicators:

Key Project performance indicators

- Reduced electricity consumption in selected irrigation systems and improved efficiency of irrigation systems;
- Lower operation and maintenance costs in selected irrigation systems;
- Larger area of irrigated land; and
- Management capacity building and improved equipment capacity of WUAs, creation of a WUA Federation.

Intermediary and final outputs

- Number of pump units taken out of operation;
- Length of restored sections of main and secondary canals;
- Length of restored sections of on-farm canals;
- Area services by improved irrigation systems;
- WUAs with developed management capacity;
- Existing WUAs benefiting from support due to improvement of their equipment capacity;
- Beneficiaries consuming services of improved irrigation systems;
- WUAs consolidated as a result of the WUA Federation creation;
- Trained WUA staff, including females; and
- Number of Environmental and Social Management Plans prepared for individual sites.

### 3.11. Project Risk Assessment

Risk group	Description	Risk level assessment	Impact on Project indicators	Mitigation measures	Risk level assessment after mitigation measures
Design risks	Risks of design errors and poor quality of design documentation.	Medium	High	<p>Contractors will be hired following the Procurement Policies for Projects Financed with the EFSD Resources and the IBRD Guidelines on Procurement of Goods, Works and Non-consulting Services in the part consistent with the Procurement Policies of the EFSD. <i>Inter alia</i>, the Manager will follow prior review procedures for:</p> <ul style="list-style-type: none"> <li>all contracts selected through international competitive bidding,</li> <li>contracts selected through local competitive bidding if their cost exceeds US \$3 million and the first two of such contracts irrespective of their cost.</li> </ul> <p>IBRD experts are expected to be engaged for the purposes of monitoring implementation of the above procedures by the Beneficiary.</p>	Low
Construction risks	Risks of Project implementation cost overruns compared to the FS parameters.	Medium	Medium		Medium
	Risks of Project implementation time overruns compared to the FS parameters.	High	Medium		Medium
Operator risks	There is a risk that during implementation of the EFSD Project, the PIU may have to assume the responsibility and accountability for management of another project, and it may result in a lack of skilled staff and time.	Medium	High	<p>The Manager maintains contacts with all the IFIs, working in the irrigation sector in the framework of this PIU. The number of staff required to be engaged in the Project implementation has been analysed and costs of hiring the staff have been budgeted in the Project.</p> <p>A fully functioning PIU, including availability of necessary resources and qualified staff, is a separate commitment of the Beneficiary and a condition of the Agreement effectiveness.</p>	Low
Operation risks	<p>There is a risk that after the Project is completed, WUAs will not have sufficient resources to ensure efficient operation and maintenance of irrigation facilities:</p> <ul style="list-style-type: none"> <li>Weak equipment capacity;</li> <li>Low collection of water fees; and</li> <li>Poor institutional capacity of WUAs.</li> </ul>	High	High	<p>In the framework of Project preparation, a scheme of irrigation system management by WUAs and a conflict resolution mechanism will be designed;</p> <p>Training for farmers and WUAs, as well technical rearmament of WUAs are planned in the framework of the Project.</p>	Medium
Supplier risks	Risks related to insufficient capacity of suppliers to ship construction materials and difficulties with delivery of construction materials to construction sites.	Medium	High	Detailed analysis of available capacities of construction material suppliers and transportation companies at the design stage and taking the results of that analysis into account in design. Including requirements to the quality of suppliers into bidding documentation. Including sanctions into contractor	Low

				agreements.	
Financial risks	Risks of the beneficiary's insolvency.	<b>Low-medium</b>	<b>High</b>	The Manager performs on-going monitoring of the Beneficiary's debt sustainability. As at end-2014, the government debt was 43.9% of GDP. By 2016, Armenia's government debt will be within the range of 44-46% of GDP, and will be gradually going down afterwards. The government debt sustainability is not a concern. <sup>32</sup> Another factor mitigating this risk is the condition fixed in the draft Agreement that the Beneficiary undertakes to make sure that none of its external debts has priority over its debt under the Investment Loan.	<b>Low</b>
Environmental risks	The Project implementation may have negative environmental impacts.	<b>Medium</b>	<b>High</b>	Guidelines on Application of WB Social and Environmental Policies were developed in the framework of the Project preparation. WB experts will be engaged for the purposes of monitoring application of the policies.	<b>Low</b>
Social risks	Although the Project is expected to be implemented on uninhabited territories, the Project may have negative impacts on social patterns of people residing in the areas of project implementation.	<b>Low</b>	<b>High</b>	Guidelines on Application of WB Involuntary Resettlement Policies were developed in the framework of the Project preparation. WB experts will be engaged for the purposes of monitoring application of the policies.	<b>Low</b>
Legal risks	Risks of inappropriate interpretation and, as a consequence, non-performance (delayed performance) under the Investment Loan Agreement and all related documents, other than legislation of RA. Risks related to the need for suppliers to obtain permits, licenses and other documents in accordance with the national legislation of the Republic of Armenia or international treaties.	<b>High</b>	<b>Medium</b>	The key mitigating factors will include the following: <ul style="list-style-type: none"> <li>the Manager signs an agreement to extend the investment loan directly to RA, followed by its ratification in due process, which will upgrade its status to that of an international instrument, and will thereby ensure its precedence over national legislation of RA;</li> <li>incorporation of provisions on sanctions in the Agreement (suspension of financing, requirement of early loan repayment) that can be used by the Manager if the Beneficiary fails to comply with any provision of the Agreement.</li> </ul>	<b>Medium</b>
Corruption and fiduciary risks	Corruption and fiduciary risks may arise due to untargeted use of funds in the process of Project financing.	<b>High</b>	<b>High</b>	Procurement under the Project will be performed following the Procurement Policies for Projects Financed with the EFSD Resources and the IBRD Guidelines on Procurement of Goods, Works and Non-consulting Services in the part consistent with the Procurement Policies of the EFSD. <i>Inter alia</i> , in cases to be specified in the loan agreement, the Manager will resort to the procedures of prior contract review. IBRD experts are expected to be engaged for the purposes of monitoring implementation of the above procedures by the Beneficiary. Compliance control procedures will be performed	<b>Medium</b>

<sup>32</sup> Republic of Armenia: 2014 Article IV Consultation-First Review Under the Extended Arrangement-Staff Report; Staff Supplement; and Press Release, IMF.

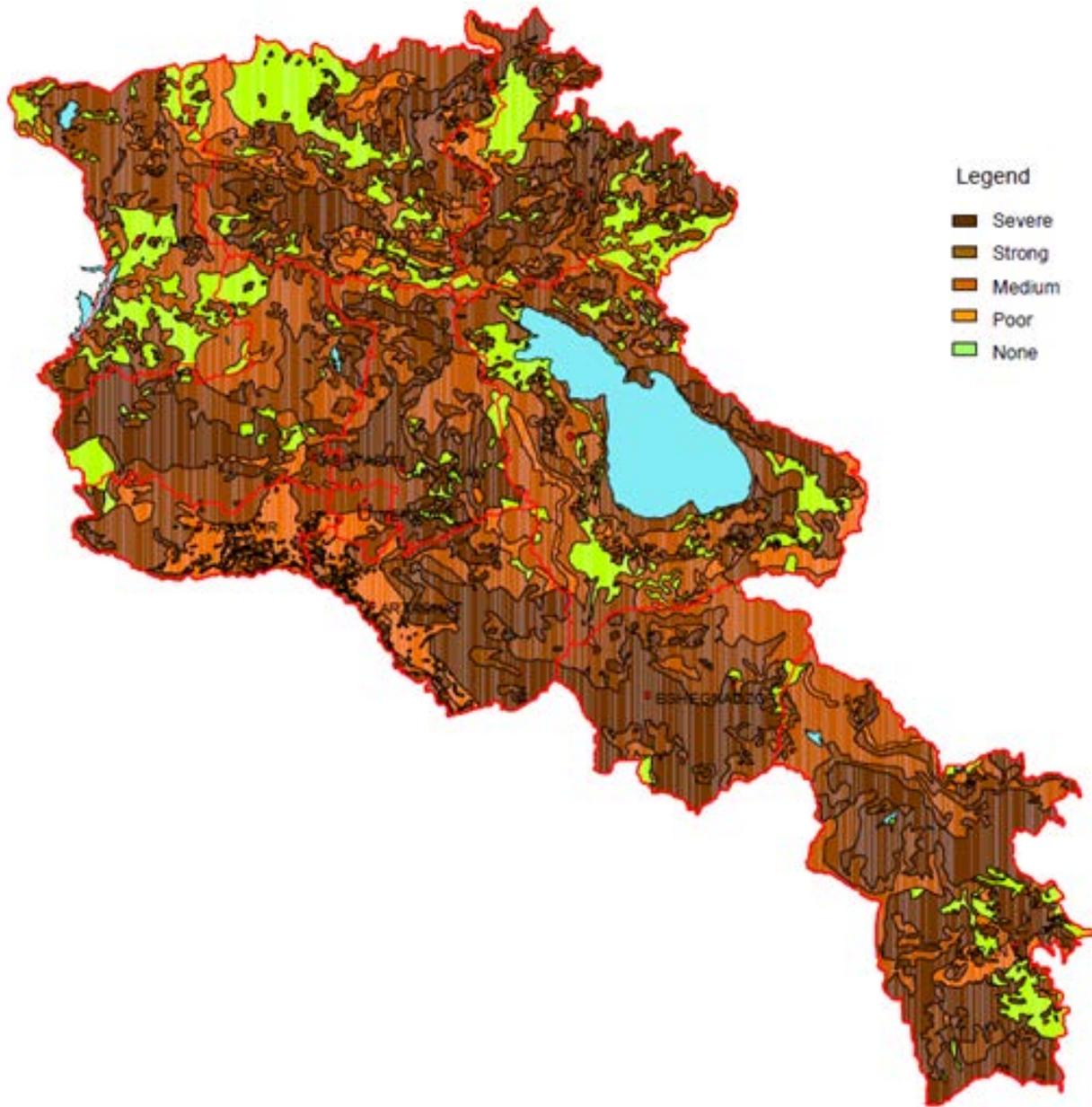
				<p>in accordance with the Manager's internal regulatory documents. The Investment Loan Agreement will specify sanctions for non-compliance with the Procurement Policies of the EFSD and applicable disbursement procedures.</p>	
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## Annex No. 1. Matrix of Project Compliance with EFSD Mission Statement<sup>33</sup>

		Objectives				
		Anti-crisis	Integration	Sustainable development		
Criteria				Social stability:	Economic sustainability:	Environmental sustainability:
		<ul style="list-style-type: none"> <li>• Project implementation in depression-stricken sector</li> <li>• Project implementation in sector exposed to crises</li> <li>• Funding of project, whose failure may produce adverse social and economic impacts (threats to food security, agricultural production capacity)</li> </ul> <ul style="list-style-type: none"> <li>• Implementation of project of strategic importance in the context of increasing budget constraints</li> <li>• Restoration of sector in the aftermath of armed conflicts, mass riots, etc.</li> </ul> <ul style="list-style-type: none"> <li>• Creation of new jobs in the context of growing unemployment</li> </ul>	<ul style="list-style-type: none"> <li>• Growth of mutual investments in EFSD member countries</li> <li>• Growth of mutual trade in EFSD member countries</li> <li>• Growth of product items for trading between EFSD member countries</li> <li>• Growth of passenger and freight traffic flows in EFSD member countries</li> <li>• Reduced overheads on traffic of passengers and goods between EFSD member countries</li> <li>• Reduced time of traffic of passengers and goods between EFSD member countries</li> <li>• Improved access (reduced costs and time) to key transport hubs (not necessarily located in EFSD member countries) linking EFSD member countries</li> <li>• Project implementation with a view to preparation of country to joining the Customs Union</li> </ul>	<ul style="list-style-type: none"> <li>• Creation of new jobs</li> <li>• Creation of new jobs for disadvantaged groups of population</li> <li>• Improvement of food security</li> <li>• Reduction of volatility of prices for food and basic services</li> <li>• Increased accessibility of basic services (education, health care, etc.)</li> <li>• Improved access to higher quality water resources</li> <li>• Increased access to electric power supply for communities in inaccessible and sparsely populated areas</li> <li>• Extended coverage of inaccessible and sparsely populated areas with communications services</li> <li>• Provision of access to housing utility services (sewerage, gas supply, district heating) for communities in inaccessible and sparsely populated areas</li> </ul>	<ul style="list-style-type: none"> <li>• Growth of tax revenue (both directly from project implementation, and indirectly, from creating conditions for development of other industries and/or businesses)</li> <li>• Development of export-driven sectors</li> <li>• Growth of share of domestic value-added products</li> <li>• Support of stability of operation of national power supply systems</li> <li>• Reduction of logistics overheads</li> <li>• Diversification of economy and/or exports</li> </ul>	<ul style="list-style-type: none"> <li>• Project implementation is carried out under stringent environmental policies (WB safeguards)</li> </ul>

<sup>33</sup> The Investment Project under review must comply with one or more criteria in each column of the matrix. Highlighted criteria indicate compliance.

## Annex No. 2. Map of RA Territories Subject to Desertification



*Source: National Action Programme to Combat Desertification in Armenia, 2002*

### Annex No. 3. Vulnerability of RA Regions to Hazardous Hydro-Meteorological Phenomena



Source: UNFCCC Second National Communication