Government of the Republic of Armenia

Proposal for
Millennium Challenge Account (MCA) Assistance

March 2005

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EXECUTIVE SUMMARY

This proposal, presented by the Government of the Republic of Armenia, seeks financial assistance from the MCA, in the amount of US$ 175 million, to support a four year program of strategic investments in irrigation and community roads, aimed at increasing agricultural production in poor rural areas of the country. The proposal has been elaborated in close consultation with key stakeholders in civil society, the most important being the communities themselves. The specific poverty reduction focus on public infrastructure in rural areas is consistent with the government's Poverty Reduction Strategy Paper (PRSP) of August 2003 and addresses directly the various impediments reducing rural poverty identified in the first full PRSP progress report of March 2005. The proposal has been prepared within the framework of the guidance for MCA assistance provided to eligible countries.

Main Highlights

- **Objective:** **Increase Agricultural Productivity and Output, and Reduce Rural Poverty**
- **MCA Financing:** **$175 million**
- **Implementation:** **4 years**
- **Key Sectors:** **Irrigation and Rural Roads**
- **Impact:** **5% Decrease in Rural Poverty by 2009**

Economic Context. Since 1994, Armenia has enjoyed a period of uninterrupted growth that has averaged 8% annually, one of the highest amongst all the transition economies. Following the break up of the Soviet Union and Armenia's subsequent declaration of independence in 1991, there have been three distinct periods of economic growth: a **first** phase (1991-93) of severe economic contraction; a **second** phase (1994-99) which involved Armenia's transformation to a market economy, characterized by a successful stabilization and reform program and average annual GDP growth rates above 5%; and a **third** phase (2000-04), which saw an increased government focus on improving the business investment climate and annual growth rates that exceeded 10%.

At the policy level, economic reform measures were put in place aimed at building a market-oriented economic system with the following objectives: macroeconomic stability, low inflation, strong fiscal discipline, tight monetary policies, and the privatization of state-owned enterprises. These policies have resulted in Armenia's transformation to a fully liberal economy. In acknowledgement of this progress, the Heritage Foundation's 2005 Index of Economic Freedom, ranked Armenia 42nd out of 155 countries. At the beginning of 2003, Armenia became a full member of the WTO.

Poverty Context. At the end of the 1980s, the combined effects of a serious earthquake, the break up of the Soviet Union, and the Nagorno-Karabagh conflict led to a sharp increase in the level of poverty. Despite resumption of economic growth in the mid-1990s, its impact on poverty was not felt until towards the end of the decade. Recent data confirms that poverty started to decline more strongly since 1998, especially extreme poverty. By 2003, 43% of the population was classified as poor (i.e. below $22 a month) of which 7.4% were very poor (i.e. below $13 a month) as compared with 55% and 23% respectively in 1998/99. In 2004, per capita GDP income of Armenia's 3.2 million population was estimated at about $1100.

An important observation emerging from Armenia's recent poverty data is that the gains from high economic growth rates have not been equally distributed amongst the population, nor across different regions of the country. Growth has mostly benefited the capital Yerevan, and, to a lesser extent, other cities, while poverty reduction for the population living in rural areas has been almost stagnant.

Recent evidence suggests that the impact of agricultural growth in reducing rural poverty in Armenia has been much stronger than that of economic growth; in particular, data from household surveys shows that each percentage point of growth in agriculture during 2000-2003 had resulted in a reduction of 0.37% in rural poverty by 2003. Consequently, specific policies and investments aimed at promoting sustainable growth in agriculture are key to bringing about a reduction in rural poverty.

I Purposes and Objectives

Proposed Investment Areas. A productive agricultural sector is important for the national economy, vital for food security as well as for rural poverty alleviation, and provides links to downstream industries such as agricultural processing. More than one million people, or 35% of the population, live in rural areas and their economic livelihood is dependent on agricultural production. In 2003, farm income accounted for more than 50% of total income of rural households. With very few opportunities for off-farm employment, Armenia's rural population depends for survival on small farms.

There are two important preconditions for productive agriculture in Armenia: (i) investment in **irrigation,** which is key to increasing agricultural production, improving labor productivity and eradicating rural poverty; and (ii) investment in a **rural roads network,** which is essential for commercializing agricultural production in rural communities. Only 10% of Armenia's rural road network is in good condition and there has been minimal investment, or maintenance of the network, over the past decade.

Proposed Goals.

(i) The proposed investments in **irrigation** are aimed at expanding irrigated land area and increasing the efficiency of the network. These investments are expected to (a) expand irrigated areas by about 10,000 ha; (b) convert selected irrigation areas from pump to gravity irrigation to make water costs more affordable; (c) result in significant energy savings; (d) reduce water losses in the tertiary conveyance network by 50% as well as in key sections of the main canals; (e) improve drainage in agriculturally productive areas of the Ararat valley; and (f) strengthen the management and administrative capacity of water user associations. The primary project beneficiaries will be more than 110,000 small farming households (or about 40% of all rural households) who will be able to increase the productivity of their irrigated land.

(ii) The proposed investments in **rural road rehabilitation** will improve the access of rural communities to agricultural markets as well as to social infrastructure. The investments will upgrade the condition of 1105 kms of rural roads from 'very poor', or 'poor', to 'good'. The project beneficiaries are estimated to be about 390,000 rural inhabitants residing in 308 rural communities.

(iii) In terms of **results,** investments in irrigation are expected to reactivate irrigated agriculture in about 30,000 ha (22% of irrigated land), improve the reliability of a further 30,000 ha (22% of irrigated land), reduce losses in tertiary systems from 40-50% to 20-25% for 25,000 ha (19% of

irrigated land), and result in energy savings of 60 million kwh/yr (22% of energy consumption in irrigation). For rural roads, the investment would result in a 10% increase in marketable agricultural surplus in project areas after 4 years. The overall impact would be a 5% decrease in rural poverty by 2009.

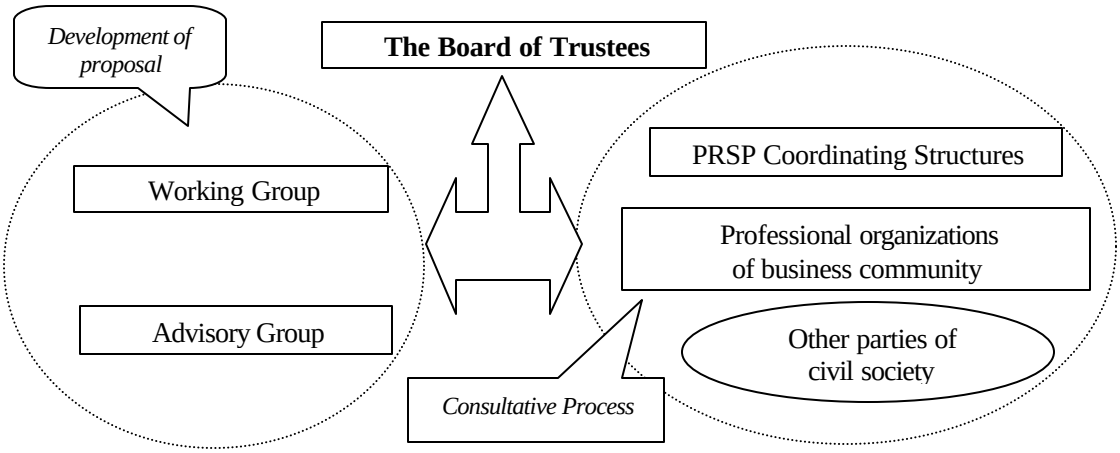
II. Justification. Agriculture productivity in Armenia depends heavily on water from irrigation schemes. Currently, irrigated areas account for less than 10% of total agricultural land while nearly 85% of total crop production is produced with irrigation. According to recent family farm field surveys, the difference in productivity between irrigated and rain fed agriculture is estimated between US$900-1,000 per hectare. Thus, given the prevalence of small farm households in Armenia's agricultural sector, they will be the main beneficiaries of such interventions. Analyses based on standardized farm models indicate that, even without taking into account a change in crop patterns, increasing irrigated land by 30% for an average farm will generate incremental net income sufficient to a lift a family out of poverty.

A recent evaluation of the condition of Armenia's irrigation network revealed that, only 135,000 ha, or about 60%, was efficiently irrigated. Three main problems explain this situation and are the justification for the proposed investments. First, the high cost of water supply in areas with predominantly pumping irrigation makes irrigation uneconomic; second, water losses are high, typically 40-50% in tertiary canals; and, third, most of the pumping stations have high electricity consumption and maintenance costs.

Linkages between road conditions, economic development and poverty in rural areas are well documented in Armenia. First, regions with the worst road network conditions also tend to be the ones with higher incidences of poverty. Second, community poverty levels correlate strongly with distance from a district center, distance from Yerevan, and with altitude. Third, various studies have shown a close relationship between road conditions and agricultural surpluses, and hence lost income, due to the lack of transportation for agricultural products to markets.

III Consultative Process. The Government of Armenia and the Board of Trustees of Armenia's MCA proposal have placed particular emphasis on a broad-based consultative process, covering the entire territory of the country, during the preparation of this proposal. A specific set of structures, comprising a Board of Trustees, a working group, and an advisory group, was set up to help ensure that the consultative process was properly implemented and coordinated (Figure 1).

Figure 1. Schematic framework of the consultative process



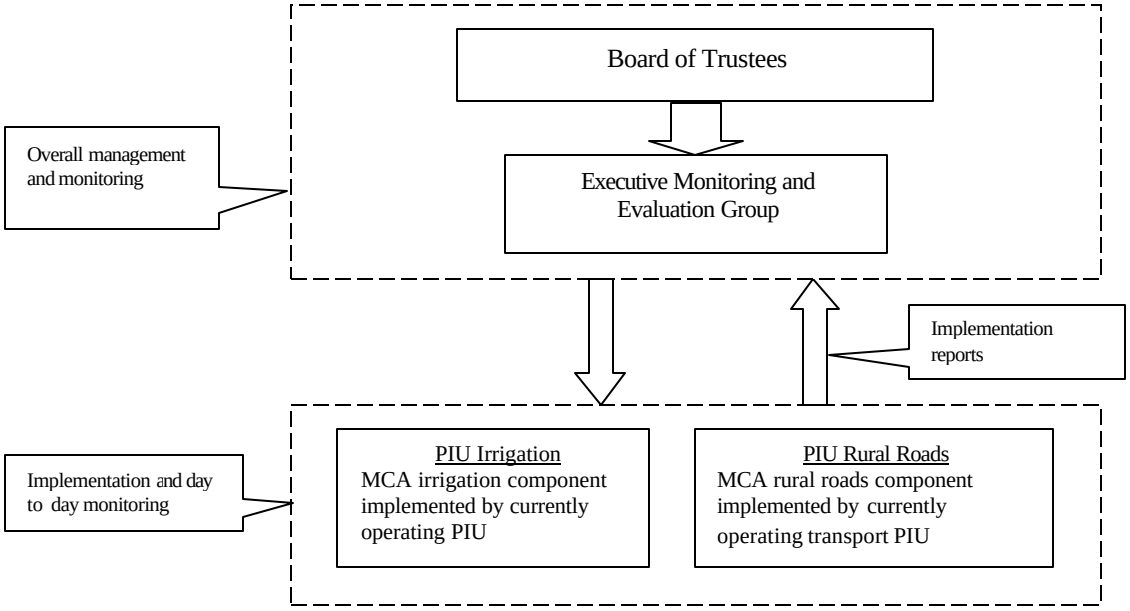
Mechanisms for ensuring an adequate consultative process were defined by the Board of Trustees. Discussions and consultations were held in all *marzes* of Armenia during the period of June-September, 2004. Consultative meetings in marzes were organized by both regional authorities and by representatives from *marz* NGOs involved in the PRSP process. Extensive use was also made of the internet and e-mail, mass media and interviews, and dissemination of the booklet on the MCA. The government plans to continue public involvement during implementation of the investment program.

More than 1200 individuals participated in the consultative process and some 230 written proposals were received on particular investment projects. The main needs reflected in the proposals were (a) job creation through improvement in the business environment; (b) improvements in physical infrastructure that included irrigation and drinking water systems, repair of local roads, and expansion of the gas supply system; and (c) better access to social infrastructure such as education and healthcare. Each of these needs is important for a coherent approach to reducing rural poverty. Donor assistance from USAID, World Bank, UNICEF, UNDP, GTZ and others is supporting social infrastructure while funding from the MCA is being sought to expand rural infrastructure.

IV. Implementation The project investments will be implemented over **four** years.

a. Institutional Framework. The basic strategy is to make use of existing institutional arrangements for project implementation, reporting to the MCA Board of Trustees. Thus, implementation of the irrigation and rural roads components would be the responsibility of Project Implementation Units (PIU) for similar donor-funded investments. Given the increased size of the investment programs in irrigation and transport, they would need to be further strengthened by contracting additional staff. Both PIUs would report to the already established Board of Trustees for the MCA, chaired by the Prime Minister, which, in addition, would have an executive monitoring and evaluation group. The Board would be enlarged to include civil society representatives and some donor representatives in an advisory capacity.

Figure 2. Organizational Structure of Armenia's MCA Program



b. Donor Coordination. Close coordination would be maintained with donors on sector policy and implementation issues using the government's aid coordination unit in the Ministry of Finance and Economy used during the PRSP process. In the irrigation sector, the main donors over the past decade have been the World Bank (approximately $60 million in three operations) and IFAD ($15 million) while the main policies on which coordination is required are the phase out of subsidy policies and the contributions of water user associations to capital investment plans. In transport, the main donors have been the World Bank ($70 million, of which $57 million is for preservation of the road network) and the Lincy Foundation, a US-based non-profit organization ($90 million for roads).

c**. Policies.** The broad policy framework for the MCA proposal is closely linked to the policy priorities already being pursued by the government under the PRSP where rural poverty was recognized as a serious concern. The PRSP identified five policy priorities to help reduce rural poverty which the government has since adopted. At the sector level, the main policy being supported under donor-financed irrigation projects is an effective cost recovery mechanism and the need for water users to contribute to O/M and capital improvements of the tertiary network. In rural roads, the main policy objective will be to ensure an adequate funding mechanism is in place to provide for future maintenance needs as well as defining an appropriate role for local community authorities.

d. Cost and Financing. The total estimated cost of the proposed investments is **$175 million** over 4 years**.** In irrigation, the estimated cost of investments is **$118 million** while in rural roads the estimated cost of investments is **$57 million.** Financing in the amount of **$175 million** is being sought from the MCA The investments in irrigation form part of a continuing investment program, with an estimated $10.5 million financed jointly by World Bank and government funding in 2005, while budget supported investments in rural roads in 2005 will be about $5-6 million.

e. Monitoring and Accountability. The monitoring and evaluation arrangements will be the responsibility of two entities: (i) a special executive monitoring and evaluation group, under the Board of Trustees for the MCA, which would have responsibility for monitoring the broader impact of the investments on agricultural productivity, output, improved marketing access, and on rural poverty; (ii) two PIUs, reporting to the Board of Trustees, which will be responsible for monitoring implementation progress, including project inputs and outputs.

V. Sustainability Strategy. The key elements and related commitments of the government's strategy to sustain progress under the proposed MCA program are contained in its Letter of Development Policy of October 2004 to the President of the World Bank. This letter describes the government's medium-term economic reform program which has specific, monitoring indicators (through to 2007) in consolidating macroeconomic reform, strengthening governance, and modernizing the rural economy. A central theme of the government's reform program is modernization of Armenia's rural economy and investments in both irrigation and rural roads are priority areas. In the irrigation sector, the government is planning to take steps to merge the currently separated ministerial responsibilities for irrigation development and drainage. The management of Armenia's irrigation network has been recently devolved to 54 regional water user associations. Steps are being taken towards longer term sustainability by improving cost recovery in irrigation, giving authority to newly created water user associations to manage the country's irrigation system, and allocating scarce budget resources (the 2005 capital budget contains $ 5-6 million for rural roads).

VI. Commitment to MCA Criteria. The government of Armenia remains committed to the key principles which established its eligibility for MCA assistance. These are (i) policies that deepen the democratic process, strengthen the judiciary, and encourage increased private sector involvement in the economy; (ii) the reduction of poverty through economic growth; (iii) consultation processes that seek the participation of all representatives of civil society in decisions that affect their development; and (iv) a willingness to have progress towards fair election processes, economic openness, and citizen participation monitored by independent observers.

In terms of the three, core performance areas and related indicators, Armenia's ranking in FY 2005 is above the median for the 16 indicators except for 2 social expenditure indicators. The following actions are being taken, or have been taken, to either consolidate or strengthen its performance:

(i) **Ruling Justly:** The government is putting in place policies, processes, and monitoring systems aimed at advancing Armenia's progress towards a liberal democracy and a more just society in which all its citizens participate. It remains strongly committed to improving governance and fighting corruption. Since the adoption of an Anti-Corruption Action Plan, it is well advanced in implementing the planned 98 measures. Some 12 working groups, which include NGO representation, are monitoring corruption cases. A special unit has also been set up in the President's office to monitor corruption concerns. Finally, under the PRSP, the government's performance under Civil Exclusion and Inequality will be monitored in areas such as freedom of the press, government effectiveness, rule of law, and a corruption perception index which are similar to the indicators used for Ruling Justly.

(ii) **Investing in People.** The government is strongly committed to providing basic health and education services to all Armenians irrespective of income level or gender. The PRSP again provides a framework for the government's socio-economic policies over the medium-term in which a priority area for action is enhancing human development and improving safety nets. The PRSP targets will increase public expenditure on education and health to 4% and 2.5% of GDP respectively by 2015 from 2.2% and 1.2% of GDP respectively in 2002. The government's 3-year budget expenditure plan (2005-7) in these social sectors shows encouraging progress towards this goal, with 90% of the increase in the 2005 budget allocated to health, education, and social assistance. Also, the percentage of girls completing 'primary' education (i.e. through age 12) is currently above 95%.and for 'secondary' education (through age 15) is 80-85%.

(iii) **Economic Freedom**. In its medium-term plan, the government intends to maintain economic growth at annual levels of no less than 6%, which it is exceeding, with a target for inflation of 3%. It will maintain prudent fiscal policies, keeping the budget deficit within 2-3% of GDP. As part of its policy to attract new investment, it will address weaknesses in tax and customs administration, improve public confidence in the banking and non-banking financial sector, and remove administrative barriers which still deter investment. It will also maintain its favorable credit rating in international financial markets.

Independent evidence from assessment groups such as the Heritage Foundation and Transparency International indicates that progress is already being made, with Armenia rated as the most liberal economy amongst the CIS countries and making progress in reducing corruption.

VII. Future Areas for MCA Compact Support. The present proposal represents a first step of priority investment areas for which MCA support is being sought by the government of Armenia. Assuming Armenia continues to MCA eligible in FY 2006, the government plans to present additional investment proposals that are important for Armenia's future economic development

within the framework of the Compact between Armenia and the MCC. The next proposal would likely involve a series of investments in transport that include the rehabilitation of the railways network and a new E-W road to the Georgian border, designed to improve transport modes and to facilitate growing trade within the region. This proposal would be presented during 2006.

VIII. Government Representative

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IX. Transparency

The government plans to follow a similar strategy to that adopted in making the PRSP a public document. First, there would be broad circulation of the Compact document in the Armenian language throughout the country. Second, the Compact would be made available to the public through the internet on the MCA website. Finally, discussions and roundtables would be held in all *marzes* of Armenia outlining the investment plans intended to benefit particular communities. Steps would be taken to ensure that representatives from communities in project areas attend.

MAIN PROPOSAL

1. PURPOSES AND OBJECTIVES

This proposal, presented by the Government of the Republic of Armenia to the Millennium Challenge Corporation (MCC), has been elaborated through a process of intensive consultations with the relevant stakeholders in civil society, professional and business organizations, as well as the representatives of the local communities, and within the suggested directions of the MCA assistance. The proposal is based on the priorities of economic and social development, which were put forward in the Armenian Poverty Reduction Strategy Paper (PRSP) adopted by the government in August 2003. The first Progress Report on PRSP implementation, prepared by government in September 2004, served as a reference document to identify main results, achievements, shortcomings and bottlenecks in the PRSP implementation process in 2003-2004.

1.1. Economic Recovery and Growth: the Role of the Government Policies

During the early 1990s, a severe economic and social crisis, accompanied by an energy crisis and the blockade of transportation routes which brought about an contraction in real wages, the liquidation of numerous jobs in the economy, a dramatic decline in real incomes of the population, and the demise of the social safety net, resulted in mass migration, widespread unemployment, poverty and inequality[1].

Macroeconomic stabilization and bringing down inflation in 1994-1995, removal of most price and tariff subsidies (including subsidies on bread and cross subsidies on electricity tariffs) combined with the start of the large scale financial assistance provided by IFIs, the main bilateral donors (USA, EU, UK, Germany, Netherlands and others) and the Armenian diaspora[2], as well as improvement in the external, business and living conditions[3], all served as catalysts for resuming economic growth. After a dramatic decline during 1990-1993 (GDP shrunk more than twice, comprising in 1993 only 46.9% of the 1990 level), Armenia entered a period of uninterrupted economic growth, which averaged 8.4% over the period 1994-2004. This is one of the highest figure amongst the transition countries. Growth accelerated even more in the period 2000-2004, at an average annual rate of 10.4%. Due to strong economic performance in the last decade, Armenia surpassed the 1990 GDP level by 5.4% at the end of 2004.

The analysis of the 11 years' growth history in Armenia allows a separation into two different growth periods: the recovery of growth in 1994-1999 and export and import substitution-based growth in 2000-2004.

The main factor behind recovery of growth was the expansion of internal demand based on external financing, such as grants and concessional loans and Diaspora remittances. However, this period

[1] During 1990-2001 some 645,000 jobs, or 47.4% of jobs in non-agricultural sector were cut, most of them in 1990-1995. The share of wages in the income structure of the population shrunk from 78% to 36.8% in 1993, whereas the Gini coefficient of income concentration increased in 1994 to 0.606 from 0.27 in 1990. The estimated level of emigration from Armenia in 1989-2001 comprised about 800,000 people, or about 25% of current population, and most of them left the country in 1989-1994.

[2] External assistance in 1995-1999 accounted, on average, for about 30% of GDP, of which approximately half was provided in the form of concessional loans and grants, and another half – in the form of remittances from Diaspora.

[3] Re-commissioning of the nuclear power plant and overcoming the energy crisis in 1995-1996, ceasefire in Nagorno Karabakh conflict sustained since 1994, and some improvement in transportation conditions starting from 1995.

was characterized by a lack of investment in production for two reasons: (i) internal demand in a country, with an "open" trade regime in the period from crisis to recovery, could be almost instantly met through imports rather than through the restoration of internal production, which takes much more time; and (ii) recovery of production was based on the reserve of underutilized production capacities.

Starting in 2000, economic growth substantially accelerated in almost all of the sectors of the economy (see Table 1). It was fuelled by an expansion in domestic demand, which resulted in a surge in construction (average annual growth rate in 2000-2004 was 28.7%), and growth in trade (with an annual average growth rate of 12.7% in 2000-2004), as well as by increased import substitution and strong export performance (average growth rate in 2000-2004 was 25.3%).

Table 1. Real GDP growth by main sectors in 1995 – 2004 (y-o-y % change)

	2000	2001	2002	2003	2004	AVERAGE 1995-1999	AVERAGE 2000-2004
GDP	**6.0**	**9.6**	**12.9**	**13.9**	**10.1**	**5.3**	**10.4**
Agriculture	-2.3	11.6	4.4	4.3	14.5	3.0	6.3
Industry	6.4	3.8	14.2	15.4	2.1	1.8	8.2
Construction	28.4	14.5	47.0	44.4	13.4	7.9	28.7
Transport & Communications	-0.6	16.0	6.0	8.2	17.0	7.6	9.1
Trade	8.3	15.5	15.2	14.5	10.5	19.2	12.7
Other services	9.1	5.3	7.2	7.6	12.2	2.0	8.2

Source: National Statistical Service of Armenia.

Two groups of factors contributed to this: an appropriate and consistent economic policy, and a substantial increase in private investment. An impressive change in investment patterns took place starting 2000: nominal values of domestically and externally funded public investments remained practically unchanged, while their share in total investments went down from the average 55.6% for 1995-1999 to 25.2% for 2000-2004.

Table 2. Investments in fixed assets by source of funding in 1995-2004 (% of total)

	1995-2004 AVERAGE	1995-1999 AVERAGE	2000-2004 AVERAGE
Investments in fixed assets	**100.0**	**100.0**	**100.0**
Public investments	33.8	55.6	25.2
domestically funded	10.3	17.5	7.5
externally funded	23.5	38.1	17.7
Private investments	66.2	44.4	74.8

Source: National Statistical Service of Armenia.

The nearly threefold increase in the volume of investments in fixed assets was almost fully attributable to an increase in private investment, especially investments of the population in housing construction, which was the main factor behind the construction surge in 2000-2004.

Economic and structural reforms, aimed at building a market-oriented economic system, were undertaken by the Armenian government. These reforms included sustaining macroeconomic stability and low inflation, increasing fiscal discipline, tightening monetary and fiscal policies; the

[4] In 2004, the corresponding share was 13.9% compared with 27.5% in 2003 and 33.2% in 2000, respectively.

privatization of state-owned enterprises (particularly, of public utilities, and the gradual removal of subsidies), a set of measures aimed at removal of administrative barriers and improvement of the business environment; sustaining an open economy with a low level of import tariffs[5], the absence of non-tariff regulations and quotas and practically no restrictions on financial transfers to and from abroad and within the country; the building of efficient and targeted social safety nets, based on the family poverty benefit system, and aimed at eradication of extreme poverty.

These policies resulted in Armenia's transformation to the most liberal economy amongst the CIS countries (according to the Heritage Foundation 2005 Index of Economic Freedom, Armenia by the level of economic freedom is ranked 42nd out of 155 countries and is considered the most economically free country in the CIS region). At the beginning of 2003, Armenia became a full member of the WTO.

1.2. Priority Areas for Poverty Reduction in the Rural Area through Enhancing Pro-poor Economic Growth

The positive impact of economic growth on poverty reduction has started to show since 2000[6] with increased exports, the construction boom, and an increase in the number of other developing activities in the economy. This period was characterized by stabilization of employment in the non-agricultural sector, stabilization of emigration, and a significant reduction in poverty and inequality: in 2003, 42.9% of the population were poor, of which 7.4% were very poor (i.e. below the food poverty line)[7], compared with 55.1% and 22.9% in 1999, respectively. At the same time, the Gini coefficients for income and expenditure concentration decreased from 0.59 and 0.37 in 1999 to 0.43 and 0.27 in 2003, respectively.

Household surveys, conducted in Armenia in 1999-2003, present enough evidence for economic growth being the main factor behind poverty reduction via an accelerated increase in the incomes of poor population from new employment, whereas the introduction of the family benefit system in 1999 contributed significantly to extreme poverty reduction in 1999-2003. Thus, according to 2001 and 2003 household surveys, social transfers were responsible for 25% of poverty reduction in 2003, of which social assistance (mainly in the form of family benefits) accounted for 4.6%, and pensions – for 20.3%[8], whereas the rest of poverty reduction is more directly attributable to economic growth via increases in labor income[9].

However, the gains from strong economic growth were not equally distributed between the Armenian population and the regions. Growth mostly affected the capital Yerevan, and to a lesser

[5] Armenia's weighted average custom tariff rate in 2004 was 2.5 percent (2005 Index of Economic Freedom, The Heritage Foundation, 2005, p.91).

[6] In 1994-1999 economic growth, attributable mostly to external sources of funding with very limited number of the growing clusters, did not significantly affect poverty, inequality and unemployment. On the contrary, this period was characterized by further job cuts: according to official statistics some 210,000 jobs were cut in the economy during 1995-1999.

[7] The general poverty line in 1999-2003 comprised about 2.4 US dollars (in PPP equivalent) per person per day, whereas the food poverty line, used for identification of the very poor, comprised about 1.5 US dollars in PPP equivalent per person per day.

[8] Social assistance and pensions are a more substantial income source for the very poor. Without social assistance, the level of extreme poverty (i.e. below the level of food poverty line) in 2003 would comprise 9.1% compared with the actual level of 7.4%, whereas without pensions the level would be 12.3%.

[9] The share of income from employment in total incomes of the non-poor population in 2003 comprised 56.2% as compared with 38.9% in 2001.

extent, other cities, whereas the current situation with poverty reduction in rural areas might be described as stagnant.
The biggest effect of economic growth on poverty reduction occurred in Yerevan, where poverty incidence decreased from 55.2% in 1999 to 29.6% in 2003, or by 86.4%, and each percent of cumulative GDP growth in 1999-2003 resulted in 1.75% of poverty reduction. In other cities of the country, the economic growth also led to the corresponding decrease in the poverty incidence, but to a substantially lesser extent than in Yerevan. In other cities, poverty decreased from 61.7% in 1999 to 49.9% in 2003, or by 23.6%, and each percent of cumulative GDP growth in 1999-2003 resulted in 0.48% of poverty reduction.

An analysis of economic growth and poverty reduction linkages clearly indicates that the impact of economic growth on rural poverty in 1999-2003 was much more modest than on urban poverty. In 2001, rural poverty reduction-GDP growth elasticity was about the half of the country average corresponding indicator and comprised only a quarter of it in 2003. In 2003, 1 percent of GDP growth resulted only in 0.14% of rural poverty reduction. Due to much lesser sensitivity of rural poverty to economic growth in 2003, rural poverty incidence in 2003 outnumbered urban poverty (rural poverty comprised 47.5% as compared with 39.7% for urban poverty)[10].

The main reasons are:

1. *Very limited non-agricultural jobs in the rural area and, hence, limited possibilities for non-farm activities*. According to 2001 Population Census, employment in agriculture comprised 79.6% of total rural employment[11], the second largest employment group was public services (i.e. public administration, education, health and social services) accounting for 13%, whereas employment in industry and services accounted for only 4.4% and 3.0%, respectively.

2. *Substantial and increasing labor productivity gap between agriculture and other sectors of Armenian economy*. In 2003, labor productivity in agriculture comprised only 46.4% of total labor productivity in the economy, compared to 90.1% in 1990, 108.8% in 1995 and 52.3% in 2000. This is mostly explained by substantial excess employment in agriculture, the poor state of most local irrigation networks (part of which are currently not operational) and limited mobility of the rural labor force due to the poor conditions of the rural road network, hampering the efforts of the rural population to find jobs outside the place of their permanent residence.

3. *Until very recently, a special feature of Armenia's economic growth in non-agricultural sector - so called "growth without employment"*[12]*, was an important external restriction on rural population mobility and hence for over-employment in agriculture*. At early stages of the transition, this was a result of delayed employment cuts, compared with the severe decline in output in all main non-agricultural sectors and subsequent accumulation of excess employment labor force. Economic growth in non-agricultural sectors, which started in 1994, was based almost entirely on labor productivity increases, which resulted in mass job cuts in practically in all sectors of the economy and a mass closure and restructuring of

[10] In all previous household surveys, the incidence of urban poverty was higher than the incidence of rural poverty. Thus, in 1996, urban poverty comprised 58.8%, rural poverty 48%; in 1999 58.3% and 50.7%;in 2001, 51.9% and 48.7%; and in 2002, 52.6% and 45.3%, respectively.

[11] Excluding military service and persons that did not state their occupation (mostly, temporary migrants working abroad).

[12] See for example, World Employment Report 2004-2005, ILO 2005.

enterprises in the post-privatization period. The non-agricultural job cuts in 1990-2003 totaled 742,400, or 55.3% of all non-agricultural jobs in 1990. In 2002-2003, there was a stabilization in employment, which continued in 2004 also (number of employed increased by 3,300, or by 0.3%), a fact which indicates that internal resources for job cuts in non-agricultural sectors are becoming more and more limited, and are nearly exhausted in construction and manufacturing (except machinery, chemical and light industry). In conclusion, some employment increase in non-agricultural sectors is possible, provided that strong economic performance continues, which the PRSP anticipates might take place in the near future, which in turn could relax the above-mentioned restriction.

In contrast to general GDP growth, the impact of agricultural value-added growth on rural poverty reduction was much stronger: each percent of growth in agriculture in 2000-2003 resulted in 0.37% of rural poverty reduction in 2003[13]. This means that the well-being of the rural population depends on economic growth in agriculture substantially more than on economic growth in general[14], and economic policy aimed at promoting sustainable growth in agriculture will continue to be the first priority in rural poverty reduction.

Another important issue in agricultural development is the increasing gap between labor productivity and labor income, making unit labor costs in agriculture the highest compared to other sectors. Labor productivity in agriculture in 2003 comprised 29.2% of the labor productivity in manufacturing and 10% of the labor productivity in construction, whereas incomes from labor in agriculture comprised 47.4% and 49.3% of the labor income in manufacturing and construction, respectively, i.e. the labor cost in agriculture in 2003 was about 1.6 higher than in manufacturing and 4.9 higher than in construction.

Table 3. Labor productivity and labor income in agriculture

	1990	1995	2000	2001	2002	2003
Labor Productivity in Agriculture						
% to total labor productivity in the economy	89.3	108.8	52.3	56.7	51.7	46.4
% to labor productivity in industry	90.5	92.0	33.7	37.8	35.5	29.2
% to labor productivity in construction	57.2	85.7	18.5	19.0	13.3	10.0
Labor Income in Agriculture						
% to average labor income in the economy	78.4	101.7	65.3	68.9	67.8	72.3
% to labor income in industry	71.9	93.5	50.6	47.1	45.9	47.4
% to labor income in construction	49.0	65.5	35.8	40.7	41.4	49.3

Source: National Statistical Service.

Taking into account the obsolete infrastructure and fixed capital in the rural economy[15], it resulted in much more limited possibilities of the investment generation than in the other sectors of the economy. In addition, agriculture in 1999-2004 received a disproportionate low share of investments in fixed assets, including in rural infrastructure.

[13] Agricultural value added in 2003 comprised 118.7% of 1999 level, whereas rural poverty in 1999-2003 decreased by 6.9%, i.e. from 50.8% in 1999 to 47.5% in 2003.

[14] The elasticity of rural poverty reduction from economic growth in agriculture roughly corresponds to elasticity of poverty reduction in cities other than Yerevan of Armenia from non-agricultural economic growth. In 2001 these indicators comprised 0.477and 0.473, and in 2003, 0.371 and 0.383 correspondingly.

[15] See for example, Rural Infrastructure in Armenia: Addressing Gaps in Service Delivery, World Bank 2004.

Table 4. Share of Agriculture in total investments in fixed assets (in current billion drams), 1999-2004

	1999	2000	2001	2002	2003	2004
Total investments (excluding housing)	52.8	79.9	81.7	101.4	124.7	147.6
Agriculture	10.5	6.6	5.5	6.9	6.2	7.3
in % to total	*20.0*	*8.2*	*6.7*	*6.8*	*4.9*	*4.9*
Memorandum item: Share of Agriculture in GDP %	*27.22*	*25.09*	*25.55*	*23.63*	*21.64*	*22.5*

Source: National Statistical Service.

The poor condition of rural infrastructure, especially of irrigation networks, strongly affects the structure of agricultural production, forcing farmers to cultivate crops, which are less sensitive to the quality and reliability of irrigation water supply, and may be more easily used in internal consumption or bartered with other basic commodities. This is the main reason for the relatively high share of grains, especially wheat, which in 1995-2004 occupied, on average, about 60% of total cropland, but generates the lowest revenues, compared with other crops, due to generally unfavorable conditions for cultivation of wheat in Armenia[16].

On the other hand, the country's underdeveloped rural road network results in high internal transportation costs. For poor rural communities, where distances from the marz capitals are generally higher, conditions of the rural road networks are much worse and transportation costs could be twice as high as the average. Together with substantial regional differences in crop productivity[17], which are mostly due to availability, reliability and costs of irrigation water supply, high transportation cost is the main factor determining the low level of commercialization and monetization of agriculture and the still very high share of subsistence farming in Armenia.

According to NSS[18], the average level of commercialization[19] of agriculture in Armenia in 2002 was estimated at 54.1% of total agricultural output. However, the level of monetization (i.e. the share of sales for cash) was about twice lower than the level of commercialization.

[16] In 2004, when the average yield of wheat was the highest in the last 15 years, and comprised about 2.2 tons per hectare (compared with the average yield of 1.7 tons per hectare for 1998-2003), it still comprised about 58% of average cereals yield in the high income countries, and about 40% of the yield in EU-15. On the other hand, the average revenues from wheat per hectare (provided that all the harvest is sold) comprised about 460 US dollars in 2004, or 4.8 times less than from potatoes, 5.5 times less than from tomatoes and 8.7 times less than for grapes.

[17] In 2004 the highest yield of wheat was in Ararat marz (about 3.6 tons per hectare) and the lowest – in the Vayots Dzor marz – 1.6 tons per hectare, or 2.3 times less. The difference between the highest (Armavir marz) and the lowest (Lori marz) yield of potatoes was about 3.9 times. For vegetables the difference in yields between Ararat marz and Tavush marz was about 5.9 times.

[18] See The Sales and Usage of Agricultural Produce by Farms in 2002. The Statistical Analytic Report. Yerevan 2003 (in Armenian).

[19] The commercial sales of agricultural produce are sales for cash, barter exchange and in kind payments for goods and services.

Table 5. The level of commercialization and monetization of the main agricultural produce in 2002

	WHEAT PER HA	POTATOES PER HA	VEGETABLES (TOMATOES) PER HECTARE	GRAPES PER HA	WATER-MELONS PER HA	MILK PER COW	MEAT PER TON
Total Output, current US dollars	302.11	2,119.0	2,453.2	1,675.2	2,005.8	291.9	1,551.7
Level of commercialization, %	27.3	42.8	66.1	69.9	92.7	37.1	78.5
Level of monetization, %	14.2	28.4	53.8	63.8	81.0	26.1	68.2
All revenues (cash, barter, in-kind), current US dollars	82.5	906.9	1,621.6	1,171.0	1,859.3	108.3	1,218.1
Cash revenues, current US dollars	*42.9*	*601.8*	*1,319.8*	*1,068.8*	*1,624.7*	*76.2*	*1,058.3*
The share of transportation costs to total output, % *	20.2	16.3	26.4	13.9	32.2	16.5	1.8

* The average transportation cost is calculated assuming 40.3 kilometers average distance and 400 AMD per ton/km (for milk – per1000 liters/km).
Source: National Statistical Service of Armenia.

The analysis shows a substantial positive correlation between the levels of commercialization and monetization of agricultural produce, and the level of productivity: *the higher the total output, the higher are general and cash revenues. The lowest productivity and, hence, the lowest degree of commercialization and monetization is for wheat.*

Because of high transportation costs of agricultural exports, demand is mostly determined by the level of households' income and food processing industry growth. Being limited by the small size of domestic markets, this demand tends to suppress prices of agricultural products, whereas price indices for other goods and services grew faster, which negatively affects the level of commercialization of farms and incomes of the rural population, pressing smaller and less efficient farms to increase internal consumption and barter trading to adjust to deteriorating conditions of business.

Table 6. Agricultural Exports in 1998-2004

	2004	2003	2002	2001	2000	1999	1998
Agricultural Exports, million current USD	13.773	8.991	4.433	2.56	2.411	1.962	1.455
Share in agricultural output, %	1.46	1.27	0.67	0.40	0.46	0.34	0.18
Share in total exports, %	1.93	1.31	0.88	0.75	0.80	0.85	0.66
Share in exports (excluding FEA GN Group 71*)	3.32	2.68	1.80	1.17	1.35	1.49	0.87

* Group 71 represents the biggest item of Armenian exports, namely natural or cultured pearls, precious or semiprecious stones, precious metals, which are almost exclusively imported to be processed in Armenia and their value is not included in industry output.
Source: National Statistical Service of Armenia.

In 2003 and 2004, a rather substantial increase in prices of agricultural products occurred due to improved domestic demand as a result of strong growth in food processing and increases in the incomes of the urban population, as well as to strong growth of agricultural exports, which during 1998-2004 increased more than 9-fold. However, the volume of agricultural exports is still negligible, when compared with agricultural output. Adding more higher value products and

reducing both internal and external transportation costs, will, to a great extent, contribute to a further growth of agricultural exports and thus will be an important factor for a favorable dynamics of internal prices of agricultural products.

Table 7. Prices on agricultural products and other goods and services (1997=100)

	2004	2003	2002	2001	2000	1999	1998
Agro products price index	108.0	98.5	90.3	88.4	80.5	90.4	104.4
Price indices for resources for agro production*	122.5	114.6	107.5	105.9	102.0	97.8	100.0
Producer Price Index	161.6	132.8	109.7	108.7	112.8	112.3	108.2
Capital construction price index	133.0	131.3	129.5	124.5	121.0	120.3	113.7
Road transport freight tariffs index	112.8	108.1	104.9	105.2	106.1	99.0	99.8
Consumer price index	123.3	115.2	106.1	104.0	101.1	100.7	98.7

* 1998 = 100

Source: National Statistical Service.

However, these improvements did not fully offset the previous negative price dynamics and the external conditions for agriculture tend to be less favorable than in 1997.

The promotion of sustainable economic growth in agriculture, according to the PRSP, should take place as follows:

- Labor productivity increases;
- Enhancement of the level of commercialization of the rural farms and facilitation of transfer from the subsistence level farming to agricultural businesses; and
- A better integration of the rural population into the economic life of the country and diversification of the sources of their income from labor.

These goals are substantially interconnected. Labor productivity increase and the narrowing the productivity gap between agriculture and the rest of the economy is, in a sense, a result of enhancement of the level of commercialization of the rural farms. On the other hand, labor productivity increase is a prerequisite for transfer to agricultural businesses and abolition of subsistence farming. In order to increase labor productivity, more non-agricultural jobs in rural settlements should be available and labor mobility must increase. However, labor productivity growth in the current state of rural development should be considered as a highest priority and as the main instrument to increase incomes of the rural population.

There are three subsets of financial instruments needed to achieve this, namely, public investment program, facilitation of access to credits, and the creation of an operational insurance scheme. The main reason for any public financial participation is the current dramatic lack of internal savings in the agricultural sector of the economy, as well as the lack of efficient mechanisms of mobilization of savings for investment purposes.

On the basis of this analysis, two main issues may be singled out, namely sustainability of economic growth in agriculture and high transportation costs.

The sustainability of agricultural growth should be considered as a key problem for economic development in Armenia, due to the following reasons:

?? The low (actually the lowest in the whole economy) labor productivity, resulting in high and increasing unit labor costs (because of unfavorable price dynamics) which severely limits the savings from agricultural activities, and, hence, potential investment generation;

?? A dramatic lack of investment has resulted in a further deterioration of rural infrastructure[20] and obsolete and inefficient fixed assets;

?? Labor intensive type of agriculture, prevailing in Armenia since land reform, completed at the early stages of transition, predetermined the extensive type of agricultural growth, with a practically unchanging level of labor productivity and little positive dynamics in the yields of crops and diary products.

While the shortage and quality of fixed capital in agriculture may be eventually sorted out by facilitating the access of farmers to borrowing, the rural infrastructure issues demand substantial investments, which cannot be generated from the limited internal savings derived from agricultural activities.

1.3 Community Preferences

The survey on community preferences in respect of future investment in rural development performed in Armenia in 2004[21] indicated the following priorities:

?? Investments in gas and piped drinking water
?? The provision of improved irrigation and roads
?? Improvements to the telephone service

These preferences cover important social infrastructure needs as well as critical infrastructure needed to boost agricultural production. The Government's approach is to seek financing from the World Bank and other donors for social infrastructure investment and, in parallel, seek MCA assistance to address the main infrastructure impediments to increasing agricultural production in rural communities, which will result in the sustainable increase of the volume and level of incomes of the rural population.

1.4 Irrigation as the main precondition of productive agriculture

Currently the most effective and reliable way to increase labor productivity, accelerate growth and eradicate rural poverty are investments in irrigation networks. During Soviet Union times, the volume of cropland under permanent irrigation was 280 000 hectares, or 57% of all arable land. The Soviet irrigation system was based on the mechanical irrigation principle with extensive use of electricity (around 600 million kilowatts yearly in the late 1980s compared with 222.8 million kilowatts in 2003) and water was provided free of charge.

The lack of recurrent expenditure, and maintenance, on the infrastructure over the last decade, has had a deleterious impact on the condition of the network. The irrigation infrastructure is in a poor

[20] The lack of recurrent expenditure, and maintenance, in infrastructure over the last decade, has had a deleterious impact on the condition of the network. The irrigation infrastructure is in a poor state or entirely non-operational in over 52% of previously irrigated land. 20% of the total network is regarded as being in good condition, whilst 28% is regarded as being in fair condition. Regarding the road network, from a total length of 3,692km of roads which connect rural communities with main roads, 2,250km (61%) are classified as poor or very poor, with a further 1033km (28%) in fair condition and only 406km (11%) in good condition . Furthermore, only 597km (16%) of these roads are fully passable during the winter time, while over 748km (20%) are completely impassable. (see Rural Infrastructure in Armenia: Addressing Gaps in Service Delivery, World Bank 2004, pp. 110, 118).

[21] Rural Infrastructure in Armenia: Addressing Gaps in Service Delivery, World Bank 2004

state or entirely non-operational in over 52% of previously irrigated land. About 20% of the total network is regarded as being in good condition, whilst 28% is regarded as being in fair condition.

Currently over 80% of crop output is produced on permanently irrigated lands, comprising about 140 000 hectares. The average yield from 1hectare of permanently irrigated land with the current structure of the crop budget, with the prevailing share of wheat, is about
US$ 900-1,000 higher than the yield, harvested from 1 hectare of non-irrigated land. Based on this, the restoration of normal irrigation water supply will have an immediate and direct effect, of the order of US$140 million annual increase in the volumes of agricultural crop production (or about US$ 70 million increase in agricultural value added, i.e. 9% increase as compared with the 2004 level). On the basis of conservative changes in the structure of the crop budget (i.e. 10-15% reduction in the share land under grains and a corresponding increase of lands under potatoes or vegetables cultivation) the increase could be even more i.e. in the range of 11-12% of 2004 agricultural value added, which would result in a reduction of rural poverty in the range of 3.3-4.5 percent.

However, a full restoration of the Soviet-type irrigation system, at an estimated cost of about US$ 800 million is not economically viable, especially in areas, where the multilevel mechanical irrigation systems are operating, because of the very high price of water for irrigation provided via mechanical pumping. In these conditions, the irrigation investment strategy should aim at the improvement of the level of commercial viability of crop production, keeping or upgrading mechanical irrigation system only in the places, where they are economically efficient and replacing them with the gravity and other systems, which will provide water at an economically acceptable cost.

Although the bulk share of investments in agriculture were in irrigation[22], there is still a very substantial funding gap, which, in the medium – term, can only be met by external funding. The urgency of the need for improvement of the irrigation systems as a base for economically viable agriculture and rural poverty reduction is further amplified by the forthcoming elimination of the irrigation tariff budget subsidies in 2007.

1.5 Rural Roads Network improvement to foster community economic development

Another internationally proven priority way of rural development acceleration and poverty reduction are investments in the rural road networks. Out of a total length of 3,692km of roads, which connect rural communities with main roads, 2,250km (61%) are classified as poor or very poor, with a further 1033km (28%) in fair condition and only 406km (11%) in good condition . Furthermore, only 597km (16%) of these roads are fully passable during the winter time, while over 748km (20%) are completely impassable[23].

[22] Total volume of investments in irrigation during the last decade was about US$ 128 million, funded exclusively from the external sources (113 million UD Dollars – three consessional credits from the World bank, one of which is ongoing, and 15 million US Dollars IFAD investment program). Government is providing budget subsidies for mechanical irrigation systems to partly cover the cost of electricity and subsidize the current tariffs for irrigation. The tariff subsidy will be terminated starting 2007.

[23] Rural Infrastructure in Armenia: Addressing Gaps in Service Delivery, World Bank 2004, p. 118

There is a proven correlation between the level of community development and rural network conditions in many countries, including in Armenia[24]. Rural poverty in Armenia almost always goes together with a poor road network. Most of the poor rural communities are located at 1700 meters above the sea level, and practically all of them have unsatisfactory access conditions to the main interstate roads. Thus, poor communications to the external world is a factor deepening the already existing poverty, which is mostly due to unfavorable conditions for agricultural activities, the absence or unreliability of irrigation, and the very low level of commercialization of farming.

Furthermore, improvement in the rural road networks conditions may substantially increase the incomes of the poor from making possible, or facilitating, their access to jobs outside of their communities, as well as increase commercial sales of agricultural produce in district and marz urban markets. According to some estimates, the poor condition of rural roads resulted in significant losses of produce in 42% of rural communities, with 18% of communities reporting output losses of 40% or more, and a further 24% reporting losses that exceeded 30%. In a small proportion of the communities, these losses, which result from the inability to get the crop to market in time, accounted for 70-80% of the total harvest of the community[25].

While the road network in Armenia has benefited from a significant injection of foreign funds during the past five years, these funds have been targeted to the rehabilitation of the main (mainly interstate) roads, with the intention of returning them to good condition. The secondary and local roads, which connect rural areas to the primary road network and to the main regional commercial centers, have received almost no capital or recurrent funding for the past decade. Total expenditures on rural roads have amounted to approximately US$ 0.5 million over the last five years, with approximately half (US$ 0.23 million) funded from community budgets.

On the basis of rather conservative estimates, the rehabilitation of the rural roads may generate an additional income around US$ 40 million annually (about 5% of 2004 agricultural value added), mostly because of diversification of the incomes of community residents from employment outside of their communities and increases in sales of the agricultural produce in the regional markets. The overall result is a significant reduction in rural poverty amongst the poor as well as in remote rural communities in the range of 10-12% (the total effect on the poverty reduction throughout the country may be estimated at about 1.5-2%). Other aspects that will be positively affected are better access to the basic education and health services, which will also contribute to the better use of general education and health establishments, which is also one of the government priorities under the PRSP.

Rural roads being public goods should be financed publicly. Here also the investment program in the medium-term future can be funded only via external assistance. However, an economic justification and criteria for the selection of the rural roads should apply. The government's economic justification and road selection criteria is described in the next section of this Proposal.

[24] *"Poorest Communities In Armenian Marzes", Armenia Social Trends, Information Analytical Bulletin, Yerevan, UNDP, 2002 - 2004*

[25] Rural Infrastructure in Armenia: Addressing Gaps in Service Delivery, World Bank 2004, p. 25

2. PROGRAM DESCRIPTION BY PRIORITY AREA

2.1. Priority Area 1: Irrigation Project Summary

2.1.1. Project development objective

The proposed project component will contribute to poverty reduction in rural areas by means of enhancing the productivity and sustainability of irrigated agriculture. It will enhance rural economic development by providing the basis for moving the agriculture sector from predominantly subsistence farming to commercial agriculture, thus helping to increase farmers' income enough to lift them from poverty. It would also contribute to overall economic growth by stimulating non-farm employment creation in agro-food downstream industries and boost domestic demand due to multiplier effects of project generated incremental income flows into the economy.

2.1.2. Justification

Agriculture is essential for the Armenian national economy and particularly critical for food security as well as for poverty alleviation in rural areas. For one third of the population that lives in rural areas, it is the main source of livelihood, with farm income (both from sales and own account consumption) accounting for nearly 60% of total income of rural households in 2003. With very few opportunities for off-farm employment, people depend for survival on their small farms. Currently, the farm household sector, with about 340,000 farm households, generates over 95% of the total agricultural production; however, the average holding is only 1.4 hectares of arable or perennial crop land, typically divided into 3 or 4 plots. Farms generally are diversified, with a strong subsistence orientation due to low productivity.

About 1.4 million ha are used for agriculture, with arable land covering 494,300 ha, perennial crops about 37,800 ha, and pastures the remainder. Currently, around 220,000 ha are covered by irrigation systems (down from 315,000 recorded in 1987), but only 60 % of this area effectively received water in 2004, due to high deterioration of the system.

Agriculture productivity in Armenia heavily depends on water from irrigation schemes. While the currently irrigated area accounts for less than 10% of total agricultural land, nearly 85% of total crop production is produced with irrigation. This is explained by both higher crop yields and higher values of crop budgets from irrigation based agriculture as compared to rain fed agriculture. According to very recent family farm field surveys, the difference in productivity between irrigated and rain fed agriculture is estimated at about US$900 per hectare. Table 8 gives an illustration of estimated returns to irrigation water at farm gate by main crops and 4 agro-economic zones.

Table 8. Net Return to Irrigation Water at the Farm Gate (US cents per cubic meter)

CROP	ARARAT PLAIN AREA	HILLY AREA	MOUNTAINOUS AREA	SUBTROPICAL AREA
Wheat	12	6	5	11
Vegetables	26	2	20	33
Potato	54	11	42	29
Alfalfa	1	0	1	0
Fruits	23	72	25	61
Grapes	51	22	-	11

It is clear that investing in irrigated agriculture, in economically sustainable manner, will spur pro poor growth since, in the Armenian context, small farm households would be the ones to benefit from such interventions. An analysis based on standardized farm models indicates that, even without taking into account changing crop patterns in response to the increased reliability of

irrigation, increasing irrigated land for an average farm by 30 % will generate incremental net income enough to lift a family out of poverty, providing that other sources of income remained unchanged.

An analysis based on information collected from 54 newly established water user associations/companies (WUA)[26] revealed that although the supply of irrigation in 2004 clearly improved in terms of reliability of supply, only 135,000 ha was actually irrigated out of about 220,000 ha covered by irrigation infrastructure. Three main problems explain this situation. *First*, the high cost of water supply in areas with predominantly pumping irrigation makes irrigation economically non-viable due to very inefficient pumping schemes. *Second*, water losses in secondary and tertiary canals are reported to be of the order of 40-50%, which effectively reduces the total irrigated area, since additional water supplies become unavailable in most cases because of technical or/and economic reasons. *Third*, most of the pumping stations have very high electricity consumption compared to their design parameters and high maintenance costs due to frequency of service disruptions beyond what was designed.

In this proposal to the MCA, the Government will address these three issues.

2.1.3. Project Description Summary

The proposed project components are aimed at an expansion of irrigated land areas and an increase in the efficiency of irrigation systems. This will be achieved through the following sub-components:

a) conversion of 19 selected schemes from pump to gravity irrigation to make water delivery affordable for irrigation on over 10,000 ha and to expand irrigation area by approximately 14,500 ha;
b) construction of 7 new small reservoirs to irrigate 2,000 ha.
c) renovation of pumping stations to save energy and increase reliability of irrigation;
d) rehabilitation of tertiary conveyance systems to bring down water losses from 40-50% to 20-25%;
e) rehabilitation of drainage system in Ararat valley on 30,000 ha;
f) rehabilitation of 4 primary canals for 20 WUAs;
g) institutional strengthening of state water supply agency and 54 WUAs.

The project will be implemented in **four** years at an estimated project cost at US$ 118 million (including project administration, design and supervision cost). Summary of objectives, outcomes and estimated cost of the Irrigation Project by sub-components presented in Table 9 below, and the detailed economic analysis of project sub-components in ANNEX 1.

[26] WUAs have been established, in line with Government ongoing reforms, aimed at strengthening the institutional set-up responsible for management of the irrigation system on the basis of participatory irrigation management principles. This was done in line with the Government strategic objective to give users substantial responsibility, progressively commercialize the sector, establish user-based incentives for improved O&M, improve the performance of irrigated agriculture and the viability of service and users institutions on an institutionally and financially sustainable basis.

Table 9. Irrigation Component: Summary of Objectives and Outcomes

HIERARCHY OF PROJECT DEVELOPMENT OBJECTIVES	KEY PERFORMANCE INDICATORS	MONITORING AND EVALUATION
MCA Objective:	**Impact Indicators:**	
1. Rural poverty reduction through long-term sustainable agricultural growth	Decrease in poverty headcount in rural areas by 5 percentage points and/or decrease in self perception of poverty in project areas by 20 percentage points over 4 years	ILCS or similar type surveys; Specific qualitative field surveys in project areas (before and after project);
General Objectives of the Component:	**Outcome Indicators:**	
1. Increased quality, access and reliability of irrigation services in project areas	Over 80% respondents record satisfaction with quality, access and reliability of irrigation services	
2. Increased marketable surpluses in project areas	15 to 20 percentage increase in marketable surpluses in project areas over 4 years	
3. Increased farmer mixed income	By 30 %	
Outpu ts by subcomponents:	**Output Indicators:**	
a. Conversion to gravity irrigation	**Conversion of 19 schemes from pump to gravity irrigation**	
1. Reduced cost and increased reliability of irrigation	Convert 10,000 ha from pump to gravity irrigation, for a total savings of 19.7 million kwh/year	
2. Increased productivity	Re-activate irrigated agriculture in approximately 14,500 ha	
b. Construction of new small reservoirs		
1. Increased productivity	7 new small reservoirs constructed and 2,000 ha shifted from rain fedto irrigated agriculture.	
c. Renovation of pumping stations		
1. Reduced cost of irrigation **d. Physical rehabilitation of tertiary conveyance structures.**	Energy savings over 39 million kwh /year	
1. Increased efficiency of irrigation system	Halve current losses in tertiary irrigation systems from 40-50 % to 20-25 % for 25,000 ha irrigated land to save over 40 million cubic meters of irrigated water	
2. Increased productivity	Re-activate irrigated agriculture in approximately 6,200 ha	
e. Rehabilitation of Drainage System in Ararat valley		
1. Improvement of land reclamation and sanitary conditions	30,000 ha of lands and 150,000 of beneficiaries	
f. Rehabilitation of Primary canals		
1. Increased productivity and reduced losses	80 million m^3 water will be saved 20 WUAs will benefit	
g. Institutional Strengthening		
1. Sustainable water organizations	54 WUAs and State Water Supply Agency	
Inputs by subcomponents:	**Input Indicators (Estimated Cost):**	
a. Conversion to gravity irrigation	US $ 32.2 million	
b. Construction of new small reservoirs	US $ 8.4 million	
c. Renovation of pumping stations	US $ 14.9 million	
d. Physical rehabilitation of tertiary conveyance structures.	US $ 24.5 million	
e. Drainage Ararat Valley	US $ 12.7 million	
f. Main Channel rehabilitation	US $ 12.0 million	
g. Institutional Strengthening	US $ 5.3 million	
h. Project adm, design and supervision	US $ 8.0 million	
d. Total, Irrigation Component	**US $ 118.0 million**	

2.1.4. Benefits and target population

The primary project beneficiaries will be about 150,000 private farming households who will be able to increase the productivity of their irrigated agriculture directly as a result of the proposed project interventions.

In addition, it is expected that project will generate indirectly about 10,000 new jobs in non-agriculture sector since incremental agricultural production will generate additional demand for local goods and services.

2.2. Priority Area 2: Rural Road Network Rehabilitation

2.2.1. Project development objective

The development objective of the project is to improve the access of rural communities to product and labor markets, as well as to social infrastructure, and to enhance the mobility of the rural population, in order to improve their quality of life and promote economic development. These objectives are aligned with those established in the Armenia PRSP.

2.2.2. Justification

Road transport plays a vital role in Armenia's regional and national economic development. Currently, nearly 90% of domestic freight and more than 95 % of passenger journeys are transported by roads. However, while the condition of main (interstate) roads over the last few years has been improved substantially as a result of World Bank financed Highway and Transport projects and Lincy Foundation interventions, the overall condition of the road network, particularly those connecting rural communities, are still in urgent need of improvement if the benefits of the current economic upturn are to be preserved in a sustainable manner. Recognizing the crucial role of road transport as catalyst for economic growth and poverty reduction, the recent PRSP emphasized the mobilization of public resources and donor assistance to improve road infrastructure as a high priority.

The public road network of Armenia consists of 7,788 km of roads, including 1,440 km of main roads, 2,621 km of secondary roads, and 3,727 km of rural roads. A recent inventory survey of rural roads revealed that the condition of more than 70% of the network can be classified as poor or very poor, with only 7% classified as good.

Linkages between road conditions, the state of economic development and poverty risk in rural areas are well documented in Armenia. *First*, regions with the worst road network conditions also tend to be the ones with a higher incidence of populations eligible for family benefits. The same is true when comparing road conditions and poverty headcount, poverty severity and the poverty gap at the marz level. *Second*, communities' self perception of poverty is closely correlated with distance from district center, distance from Yerevan, and altitude. *Third*, various studies revealed a strong relationship between road conditions and the level of surpluses of agricultural produce and lost income due to the unavailability of transportation for agricultural products to the main markets.

The PRSP give emphasis to improvements in rural road infrastructure as being key to spurring economic development by increasing incomes and employment. The lack of adequate roads is

recognized as a significant obstacle for the commercialization of products and makes it more difficult particularly for small producers to market their products, due to the high costs of transport and the resulting monopolistic conditions of the commercialization chain. In addition, the poor condition of roads severely limits mobility of labor and capital, thus decreasing the non-farm employability of the rural population.

Table 10. Rural Road Component: Summary of Objectives and Outcomes

HIERARCHY OF PROJECT DEVELOPMENT OBJECTIVES	KEY PERFORMANCE INDICATORS	YEAR 1	YEAR 2	YEAR 3	YEAR 4
MCA Objective:	**Impact Indicators:**				
1. Rural poverty reduction through improved connectivity of rural communities	Decrease in self perception of poverty in project areas by 10 percentage points over 4 years				
General Objectives of the Component:	**Outcome Indicators:**				
1. Increased quality of roads	Over 90% respondents record satisfaction with quality of roads in project areas				
2. Increased marketable surpluses in project areas	10 percentage increase in marketable surpluses in project areas over 4 year				
3. Increased mixed income from farming and non farm employment income	By 10 % over 4 year				
Output:	**Output Indicators:**				
Roads rehabilitated as planned	1105 km of rural roads improved from very poor or poor conditions to good	227.5 km	303 km	312 km	261.5 km
Inputs:	**Input Indicators (Estimated Cost):**				
Total, Rural Road Component	US $ 57 million	US$ 11.4 mn	US$ 14.3 mn	US$ 17.1 mn	14.2mn

2.2.3. Benefits and target population

The project beneficiaries will be about 390,000 rural inhabitants residing in 308 rural communities.

3. CONSULTATIVE PROCESS

3.1. Objectives of the consultative process

The Government of Armenia and the Board of Trustees of Armenia's Millennium Challenge Account Program have put particular emphasis on the participation of the public, as well as established institutional structures, in the preparation of Armenia's Millennium Challenge Account Program. For this purpose, a broad-based consultative process, covering the entire territory of the country, was organized and initiated. The main objectives of the consultative process were:

- To provide ample information to the public on the mission and objectives of the Millennium Challenge Account;
- To present the ideas of the Government of Armenia and the Board of Trustees of Armenia's Millennium Challenge Account Program with respect to possible programmatic directions of the proposal;
- To determine the relevance of the proposed programmatic directions to the real needs of the public;
- To ensure an opportunity for all stakeholders to submit proposals and/or programs to be further incorporated into Armenia's Millennium Challenge Account Program.

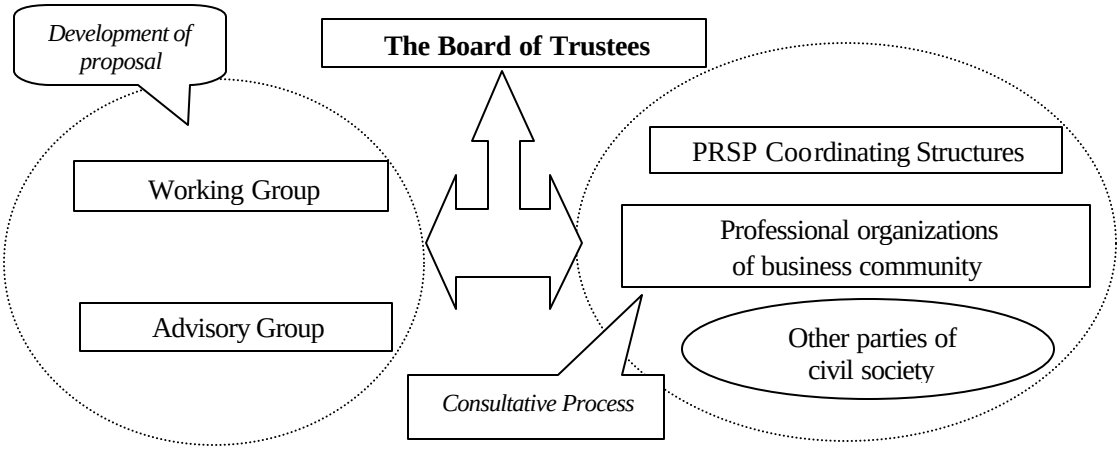
3.2. Description of the consultative pro cess

3.2.1. Structures responsible for preparing Armenia's MCA Program

Activities for developing Armenia's Millennium Challenge Account Program and ensuring the consultative process throughout the development phase were coordinated and implemented by:

- The Board of Trustees of Armenia's Millennium Challenge Account Program;
- The working group for preparing Armenia's Millennium Challenge Account Program; and
- The advisory group for Armenia's Millennium Challenge Account Program.

Figure 3. Schematic framework of the consultative process



The Board of Trustees of Armenia's Millennium Challenge Account Program:
The Board of Trustees of Armenia's Millennium Challenge Account Program carried out the overall coordination of the development of Armenia's Millennium Challenge Account Program and

organized the consultative process. The Board was established by the Decree of the President of Armenia No. 96 dated May 31, 2004. President's chief economic advisor, Ministers of Finance and Economy, Agriculture, Transport and Communications, and the Chairman of State Water Systems Committee of the Government of Armenia were appointed as members of the Board. The Board was chaired by the Prime Minister.

The Board of Trustees took the following measures in organizing the preparation of the program:

- Provided information to the public on the objectives of the Millennium Challenge Account.
- Publicized its ideas with regard to the possible directions of Armenia's program and called for a broad-based public discussion on these issues. The programmatic directions emerged from the priorities in the Poverty Reduction Strategy Paper approved in 2003.
- Established the Secretariat of the Board of Trustees of Armenia's Millennium Challenge Account Program. Conferred the functions of the Secretariat of the Board of Trustees on the PRSP Coordination and Monitoring Unit of the Ministry of Finance and Economy.
- Determined the mechanisms for organizing the consultative process. Three main directions for the implementation of the process were defined: (i) discussions and meetings with public entities involved in PRSP processes; (ii) discussions with entities representing the private sector; and (iii) measures aimed to involve associations or individuals that were not represented in the aforementioned entities.
- The particular entities to be involved in the development of Armenia's Millennium Challenge Account Program were determined and formed.

The working group for preparing Armenia's Millennium Challenge Account Program:
The Board of Trustees of Armenia's Millennium Challenge Account Program formed the working group for preparing Armenia's Millennium Challenge Account Program and for the day-to-day management of Program's development. Representatives from 12 governmental agencies and 2 non-governmental organizations[27] were included in the group. The working group:

- summarized the results of the consultative process;
- presented the main factors constraining economic growth and poverty reduction, based on various surveys and studies conducted by governmental agencies; and
- determined the possible direction of Armenia's Millennium Challenge Account Program. On this point, programs for overcoming the problems impeding development in rural areas, particularly in the agricultural sector, were presented.

It was proposed to consider investment projects for construction of gravitational irrigation systems and water reservoirs, as well as the repair of community roads.

The advisory group for preparing Armenia's Millennium Challenge Account Program:
In order to draft the final version of the proposal for Armenia's Millennium Challenge Account Program, the Board of Trustees established an advisory group consisting of independent local experts. The advisory group also made an independent assessment of the work undertaken by the working group for preparing Armenia's Millennium Challenge Account Program.

[27] "National Union of Farmers" and "Armenian Democratic Forum" NGOs.

3.2.2. Mechanisms for ensuring the consultative process

Mechanisms for organizing the consultative process were defined by the Board of Trustees for Armenia's Millennium Challenge Account Program. Three main directions for the implementation of the process were defined: (i) discussions and meetings with public entities involved in PRSP processes; (ii) discussions with groups representing the private sector; and (iii) measures aimed at involving associations or individuals not represented in the aforementioned entities or groups..

Discussions with PRSP structures: The first attempt to adopt a broad-based and institutionalized participatory approach in program development in Armenia was made during the drafting of the PRSP. The intention was to build on the achievements of this participatory approach during the implementation of the PRSP. For this purpose, through wide-scale discussions, representatives from various groups of the public, who, as a result of joint discussions, had drafted the agreement[28] on cooperation for the implementation of the Poverty Reduction Strategy Paper, were selected.

The Agreement defined the medium-term priorities stemming from the PRSP and the institutional framework for the implementation and supervision of the Agreement. As a result, a PRSP Steering Committee was formed for coordinating the process of PRSP implementation. Representatives from the Government of Armenia, communities, businessmen, trade unions, the Church, scientific organizations and five groups of non-governmental organizations[29] were represented in the Steering Committee.
Discussions and meetings with PRSP structures were conducted in all phases of the consultative process, as follows:

Meeting held at the Government Headquarter on July 4, 2004

Discussions on the preparation of Armenia's Millennium Challenge Account Program were held on July 4, 2004 with representatives of the public involved in PRSP coordination structures.
Participants were representatives from the Government of Armenia, the Board of Trustees, non-governmental and international organizations and other stakeholders.

The Minister of Finance and Economy presented the mission and objectives of the Millennium Challenge Account. Approaches of the Board of Trustees of Armenia's Millennium Challenge Account Program with regard to possible programmatic direction of the proposal were presented, as well. Participants were urged to initiate active discussions by presenting their viewpoints on the proposed programmatic directions and other possible options.
Various viewpoints were put forward. In particular, *Hranush Kharatyan*, the chairperson of "Hazarashen" Ethnological Studies Center NGO, mentioned that she fully agrees with the approach of targeting rural areas, particularly issues relating to roads and irrigation, in the Program. At the same time, she expressed her concern regarding the fact that social tension is not reducing in parallel to the economic growth of recent years. In other words, the continued economic growth is not accompanied by a social impact. Addressing this problem should be one of the main priorities of the Program. Problems of border areas, rural communities and refuges were prioritized. Importance was attached to promoting small and medium sized businesses, and the fact that there is huge labor surplus of around 240,000 people in rural areas due to job losses, and the need for a targeted policy addressing these issues within the framework of the Program was underlined. *Karine Danielyan*, chairperson of Association for Sustainable Development, mentioned that there is

[28] See www.prsp.am

[29] NGO groups involved in issues of (i) special needs groups; (ii) Human Rights protection (including education, healthcare, social security and insurance); (iii) environmental protection; (iv) small and medium-sized businesses; and (v) rural areas.

a need to register non-operational enterprises in rural areas and enact a specific policy in order to support their re-operation.

As a result of the discussion, participants agreed to organize similar discussions in their respective structures and present the results to the secretariat of the Board of Trustees.
The meeting was broadcast by all TV channels.

Meeting held at the Ministry of Finance and Economy on July 21

The second meeting with representatives of the public involved in PRSP coordination framework was held on July 21, 2004, during which the Minister of Finance and Economy presented the proposals already received. The procedure for receiving proposals and the criteria for their selection were discussed. The Board of Trustees pointed out that they will continue to take in proposals and approaches and the final deadline for summarization of proposals is set at September 2004.

Meeting held at the Ministry of Finance and Economy on October 21

A round-table discussion on the preparation of Armenia's Millennium Challenge Program was organized by the Board of Trustees at the Ministry of Finance and Economy on October 30.

The list of participants included *Vardan Khachatryan*, Minister of Finance and Economy, *Razmik Petrosyan* representing communities, *Arsen Ghazaryan* representing businessmen and employers, *Boris Kharatyan* representing trade unions, *His Grace Bishop Paren* representing the Church and representative from groups of NGOs, such as *Levon Nersisyan* representing the people with special needs, *Hasmik Aslanyan* representing the Human Rights protection sector, *Gevorg Arakelyan* representing the environmental sector, *Hrachya Javadyan* representing the small and medium-sized enterprises sector, *Vanik Soghomonyan* representing the rural areas sector.

The Board of Trustees presented the priority areas proposed by the working group for preparing Armenia's Millennium Challenge Account Program for inclusion in the proposal to be submitted to the Millennium Challenge Corporation. Representatives of non-governmental organizations and other stakeholders presented their comments and approaches regarding the proposals.

In particular, *Vanik Soghomonyan*, chairperson of National Union of Farmers, mentioned that in his opinion the Government, through analysis, has arrived to realistic conclusions. Issues of rural areas, particularly those related to rural infrastructures, are also obstacles to private investments in those areas. *Levon Nersisyan*, chairperson of Astghik NGO, mentioned that programs to be funded should be selected based on clearly defined and transparent criteria. *Razmik Petrosyan*, Mayor of Aparan, mentioned that priority areas presented by the Government do not need further justifications; any resident outside Yerevan would confirm those. *Larisa Minasyan*, director of the Armenian branch of Open Society Institute, attached importance to the formation of mechanisms for public scrutiny of the use of allocations form Millennium Challenge Account.

Information on the meeting was disseminated through all TV channels.

Discussions with specialized structures representing the private sector: In order to prepare Armenia's Millennium Challenge Account Program, the Government of Armenia organized discussions within the Business Support Board and the IT Development Support Board, where memberships consist of representatives from businesses involved in relevant activities. Meetings were held on July 10 and 15, 2004. During discussion, representatives of the Board of Trustees of

Armenia's Millennium Challenge Account Program presented the objective of the Millennium Challenge Account and the directions of programmatic proposals.

It was agreed that such meetings will be regularly held in the future, and participants will summarize their proposals and will submit them to the secretariat of Armenia's Millennium Challenge Account Program. As a result, programmatic proposals were submitted by Tanners Union, National Union of Farmers, Union of Beekeepers, National Gas Engine Association, and Union of Transporters.

Measures aimed to involve associations and/or individuals not represented in PRSP structures: The above-presented two mechanisms of the consultative process ensured the participation of the more organized groups of the public in Program related discussions. The Board of Trustees took the following measures in order to involve non-organized structures, as well as individuals in the consultative process:

- Discussions and meetings in marzes (Annex 7);
- Provision of information on the process through the mass media, interviews;
- Dissemination of the booklet on Armenia's Millennium Challenge Account Program;
- Use of internet and e-mail.

Provision of information on the process through the mass media and dissemination of printed materials: All the nationwide events mentioned above were widely covered through the mass media. Videotapes on marz level events were broadcast by national and marz TV channels. During marz events, journalistic interviews were also conducted directly with local people and presented in the same reports.

An invitation for participation in public discussions on the preparation of Armenia's Millennium Challenge Account Program was printed in June 11, 2004 issues of "Hayastani Hanrapetutiun" and "Hayots Ashkharh" daily newspapers, where it was proposed to all stakeholders to have active participation in recommending programmatic directions to be funded within the framework of the Millennium Challenge Account Program and information was provided on how and to whom the recommendation should be submitted (address of the Ministry of Finance and Economy, phone numbers and the website address of the secretariat of the Board of Trustees).

Officials representing central authorities gave interviews to news services on the objectives and the mission of the Millennium Challenge Account. An informational booklet on Armenia's Millennium Challenge Account Program was produced in more than 5,000 copies and disseminated at each meeting.

Use of the internet and e-mail: The proposal to participate in discussions on the preparation of Armenia's Millennium Challenge Account Program and complete information on discussion and meetings are published on the website of the Ministry of Finance and Economy (www.mfe.gov.am). The membership of the Board of Trustees, its statute and records of their meetings are also published on the same website. The proposal to participate in public discussions is also published on the PRSP website (www.prsp.am). The website of the Ministry of Finance and Economy also contains addresses, where anyone can send his or her proposals. The site also contains the summary sheet of the submitted proposals, which allows the authors to follow the further advancement of their own proposals.

Indirect measures/offers of support: Indirect achievements were also recorded in the consultative process. A number of NGOs and their associations offered their support to the consultative process. These organizations included, in particular, association of NGOs involved in the initiative "Partnership for an open society", "The choice is yours", "Mission Armenia", "Helsinki civic union" NGOs.

Within this context, the initiative "Partnership for an open society" organized a discussion on Armenia's Millennium Challenge Account Program on July 29, 2004, with the participation of mainly representatives from NGOs. Representatives from the Government of Armenia and the secretariat of the Board of Trustees were also invited and participated in the event. Other organizations also supported the organization and convening of meetings with the public.

3.3. Results of the consultative process

All stakeholders of the society participated in the wide-scale consultative process, including central and local authorities, NGOs, trade unions, business community and donor organizations. As a result of this process, both quantitative as well as valuable qualitative results were obtained.

3.3.1. Quantitative results

The quantitative results of the consultative process are as follows: events organized within the framework of the consultative process had more than 1,200 participants, a large number of verbal proposals were submitted during more than 20 meetings, which were incorporated into the records of those meetings, more than 230 written proposals were received, which are basically very well formulated investment projects with appropriate budgets attached.

The written proposals received were grouped by authors into the following categories:

- Central and regional authorities 58 proposals;
- Local community authorities 86 proposals;
- Scientific organizations 21 proposals;
- NGOs and their associations 49 proposals;
- The private sector and their specialized organizations 10 proposals;
- Individuals 12 proposals.

3.3.2. Analysis of the results

Job creation

Job creation was mentioned during all discussions as a problem. The issue was raised as an issue for both urban and rural communities. Within this context, proposals were submitted on improvement of the business environment and improved access to credits.

Improvement of physical infrastructure

A large number of proposals referred to the development of infrastructures. These included improvements in irrigation and drinking water systems, restoration of marz, and local roads. Numerous proposals were submitted for expanding the gas supply system in the country.

Better access to social infrastructure

During the meetings, enhancing the accessibility and improving the quality of education and healthcare was mentioned as a particularly important need, including improvement of material-technical provisions and restoration of heating in schools.

Other areas

At the same time, based on the specialization and regional belonging of participants, comments and proposals were put forward, which were specific to their field of activity and/or their region. In particular, measures for addressing the availability of quality and affordability of seeds, the lack of an agricultural insurance system and anti-hale services, problems of land salinity and outdated machinery-tractor fleets, forest restoration, desertification and landslides and reconstruction of landfills were proposed.

3.3.3. Next steps

The government plans to continue its efforts to maintain public involvement in the implementation of Armenia's Millennium Challenge Account Program, in both decision-making and program monitoring activities. The need to adopt such an approach was mentioned in most of the meetings and discussions. It is also planned to involve representatives of the public in the evaluation of the results of program implementation through relevant surveys and studies. The government will also involve them in the executive board of the body responsible for program implementation.

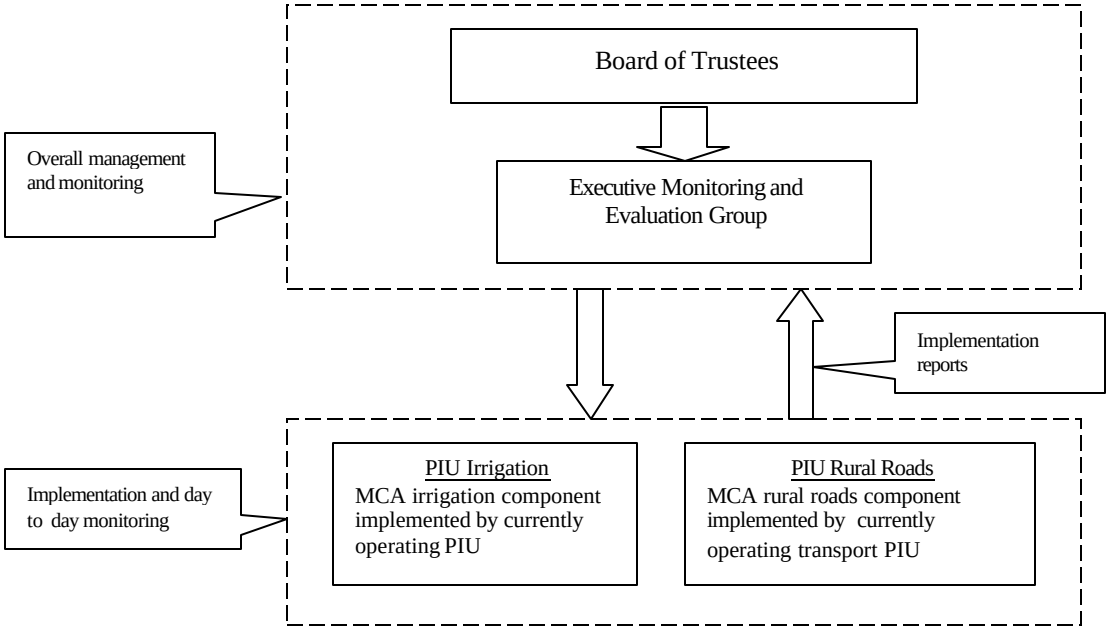
4. INSTITUTIONAL FRAMEWORK

The project investments will be implemented in a period of **four** years, tentatively from January 1, 2006 to December 31, 2009, depending on when MCA funding is approved.

4.1. Institutional Framework

The basic institutional strategy is to make use of existing project implementation experience in the irrigation and roads sectors which have a proven track record in terms of project administration. Thus, project management of the irrigation and rural roads investments will be the responsibility of the existing Project Implementation Units (PIU) that have been in charge of different World Bank-financed irrigation, dam safety, and transport projects since 2000. However, they would provide quarterly reports on overall implementation progress to the Board of Trustees of Armenia's MCA proposal that has already been established. This Board would include the Chairman of the State Water Committee as well as the Minister of MOTC and would continue to be chaired by the Prime Minister.

Figure 4. Organizational Structure of Armenia's MCA Program



Both PIUs have now acquired extensive project management experience as well as a demonstrated capacity to administer donor funding with efficiency and transparency.
However, given the increase in scope of the project management responsibilities as a result of MCA assistance, the staffing of the PIUs would need to be increased. It is estimated that a total of 15-20 additional staff (i.e. 35-40% increase), would need to be recruited for the Irrigation PIU and about 15-20 additional staff for the Roads PIU whose activities are declining as the transport project nears completion, but will need to locate staff in different regions of the country for rural roads.

Procurement. The PIUs will coordinate all project investment related activities and will be responsible for all procurement matters; procurement procedures would be simlar to those followed for the World Bank, modified to meet MCA requirements. As needed, the PIU would also undertake limited design activities, especially for rural roads. The PIUs would be responsible for the financial management of the project and for all project accounting. In this regard, they would need to satisfy the minimum requirements of the MCA in regard to financial management and disbursement arrangements and ensure that the financial systems already in place in terms of accounting procedures, software, and internal controls are satisfactory to the MCA.

Auditing. Auditing arrangements would follow established practices for donor related funding. Audits would be undertaken by independent private auditors acceptable to the MCA and contracted through an acceptable selection process. Audits would be undertaken annually and reports submitted to the MCA within six months of the end of each financial year.

Monitoring. The PIUs and will be responsible for monitoring all project inputs and outputs and will provide regular reports to the Board of Trustees as part of the project reporting requirements. However, project outcomes will be the responsibility of the Board of Trustees. For this purpose, a small executive monitoring and evaluation group will be set up under the Board of Trustees. They would commission the National Bureau of Statistics, other government sector ministries, or local consulting firms to monitor the impact of investment on increasing agricultural production, improving access to markets for rural communities, and the overall impact on reducing poverty in rural areas of the country. The Board of Trustees for the MCA proposal will provide an annual report to the MCA on the impact of the project investments.

4.2. Donor Coordination

In recent years, Armenia has had a good record in donor aid coordination. This is partially attributable to improved public expenditure management practices including planning, budgeting, execution and control. Since 1998, all externally funded credits and loans, both for general budgetary support and project financing, as well as budget support grants, are reflected in the state budget. In last two years, progress has been made also in terms of including in the budget project financed grants (particularly, capital grants) and officially provided technical assistance.

Donor activities are coordinated both through government involvement as well as through consultations amongst bilateral and multilateral donors by holding regular meetings. On the government side, the major functions related to donor aid coordination are assigned to the Ministry of Finance and Economy.

After the introduction of medium-term budgeting practices by the government at the beginning of the current decade, donors now refer to medium-term budget programs in planning their country strategies. In this regard, the approval of the Poverty Reduction Strategy Paper (PRSP) can be considered as an important step towards improved coordination of domestic and donor policies. In particular, donor country strategies approved after the PRSP refers to that as a key framework document and strategic directions of donor actions are based on country development priorities identified in the PRSP.

Donor aid coordination in the priority areas identified in the PRSP document was, in most cases, good. In the irrigation sector, the World Bank focused on rehabilitation of primary and secondary canals, while the International Fund for Agricultural Development (IFAD) worked on on-farm irrigation at the tertiary level. The actions of these two donors were also consistent and well-coordinated in terms of developing stronger management institutions for the country's tertiary network. The main donor in road rehabilitation were the World Bank and the Lincy Foundation[30]. Two projects funded by the World Bank (namely, the Highway and the Transport projects) were implemented in close coordination with the activities of the Lincy Foundation.

While developing this proposal for the MCC, the government carefully considered all past, ongoing and planned donor assistance programs relevant to the proposed activities for MCA assistance (see Table 11), in order to avoid possible duplications and overlap. The govemment paid particular attention to strengthening linkages- on the one hand between outcomes of ongoing (and/or past) donor funded projects and proposed activities, and, on the other hand, between proposed activities and projects planned to be implemented by other donors in the future.

Table 11. Main related projects funded by other donors (completed, ongoing and planned)

SECTOR / AREA OF INTERVENTION	NAME OF THE PROJECT	DONOR	STATUS
Irrigation / Agriculture			
Deteriorating irrigation infrastructure and ineffective water management	Irrigation Rehabilitation Project	The World Bank (IDA)	Completed
Enhancing profitability and sustainability of irrigated agriculture.	Irrigation Development Project	The World Bank (IDA)	Ongoing
Protecting the people and socio-economic infrastructure downstream of the dams facing highest risk of failure.	a) Dam Safety Project b) Dam Safety II Project	The World Bank (IDA)	Ongoing
Weak agricultural support services, including rural finance.	Agriculture Reform Support Project	The World Bank (IDA)	Ongoing
Lack of medium term credit resources (including for agro-industry).	Enterprise Development Project	The World Bank (IDA)	Completed
Weak land markets.	Title Registration Project	The World Bank (IDA)	Completed
Support to the continued development of commercial activities in the rural areas by improving market linkages, product quality, competitiveness and capacity of Armenian rural entrepreneurs and producers.	Rural Enterprise and Small-Scale Commercial Agriculture Development Project	The World Bank (IDA)	Planned
Weak agricultural support services and developing institutions for management at secondary and tertiary levels.	North-West Agricultural Services Project	IFAD	Completed

[30] The Lincy Foundation is an institution established by Armenian Diaspora, which during last few years granted considerable funds for rehabilitation of highways, bridges, tunnels and Yerevan's streets, construction and repair of housing units in the Spitak earthquake zone, and reconstruction of cultural institutions.

Weak agricultural support services, lack of access to rural finance, inadequate infrastructure and institutional capacity on the tertiary level.	Agricultural Services Project	IFAD	Completed
Lack of access to rural financial services, weak agricultural supporting services including business intermediation services.	Rural Areas Economic Development Programme	IFAD	Ongoing
Activities focused on agricultural marketing, rural finance and capacity building of extension and farmers' associations.	Marketing Assistance Project in Armenia	USDA	Ongoing
Lack of budgetary resources to fund priority programs in agriculture.	Food Security Program	EU	Ongoing
Road Rehabilitation / Transport			
Preservation of road network	Highway Project	The World Bank (IDA)	Completed
Deteriorated roads (highways, Yerevan's streets) and related infrastructure (bridges, tunnels, etc)	a) Road Building Project; b) Yerevan's Streets Rehabilitation Project	Lincy Foundation	Completed
Alleviation of the erosion of Armenia's road and railway asset base	Transport Project	The World Bank (IDA)	Ongoing

In regard to donor financing for irrigation, the World Bank has contributed ($58 million in three operations) and IFAD has contributed ($15 million). The main policies on which coordination is required are the phase out of subsidy policies and the contributions of water user associations to capital investment plans. In transport, the main donors have been the World Bank ($70 million, of which $57 million is for preservation of the road network) and the Lincy Foundation ($90 million for roads). Consultations with the main donor, World Bank, have already taken place in the formulation of the MCA proposal and would be extended to all donors during preparation to ensure a common approach.

4.3. Policies.

The policy framework for the MCA proposal are closely linked to the policy priorities already being pursued by the government under the PRSP. The PRSP recognized rural poverty as a serious concern, identifying several factors responsible for rural poverty-among them an underdeveloped rural distribution network and storage facilities, high transportation costs, small land holdings, and lower agricultural prices relative to consumer prices. The PRSP identified five policy priorities to help reduce rural poverty which the government has adopted. These policies are:

- promoting economic growth through macroeconomic stability;
- enhancing human development and improving social safety nets;
- implementing prudent fiscal policies and reforming the tax system;
- improving public infrastructure, especially irrigation and roads; and
- improving core public functions.

In addition to these policy priorities, a matrix of development outcomes has been agreed under the World Bank Poverty Reduction Support Credit (PRSC) approved in late 2004. The MCA proposal will support the government's efforts to attain specific investment targets in developing rural road infrastructure

At the sector level, the main policy being supported under donor-financed irrigation projects is an effective cost recovery mechanism to allow the main water agencies to

achieve financial independence from the government's budgetary process; the target year for this goal is 2007 and its attainment is being monitored under the PRSC. In addition, water user associations are expected to contribute to Operation and Maintenance costs and capital improvements of the on-farm network. In rural roads, the main investment objective will be to ensure adequate budget allocations for rural roads and that, subsequent to their construction, there is an effective funding mechanism in place to provide for future maintenance needs.

4.4. Project Selection

The specific investments to be financed in irrigation and rural roads have been identified in consultation with representatives from communities distributed in all the marzes of Armenia. The selection of these investments has been guided by the following criteria:

1. Irrigation: increasing the efficiency of the irrigation network and expanding irrigated land in rural communities with high agricultural production potential;
2. Rural roads: improving access of communities with high agricultural production potential to markets, storage facilities, and processing industries.

On the basis of the above criteria, a first year set of investments has been identified for which engineering design is under preparation. The preparation of later year investments will be defined on the basis of the same criteria and through continuation of consultation processes with rural communities.

Procurement of civil works and goods as well as the selection of consulting firms would follow procedures acceptable to MCA. In general, these would be in line with procedures in Armenia for the procurement of similar services and the procedures being followed by donors such as the World Bank for irrigation and road investments. The PIUs would have responsibility for all procurement activities.

4.5. Costs and Financing

The estimated cost of the investment program is $ 175 million over 4 years (2006-9) and would be incurred as follows:

SECTOR	COST ($ MILLIONS)	YEAR 1	YEAR 2	YEAR 3	YEAR 4
1. Irrigation	**118.0**	**25.0**	**35.0**	**35.0**	**23.0**
a. (Gravity Conversion)	(32.2)				
b. (Small Reservoirs)	(8.4)				
c. (Pumping Stations)	(14.9)				
d. (Tertiary Channels)	(24.5)				
e. (Drainage Ararat Valley)	(12.7)				
f. (Main Channels Rehabilitation)	(12.0)				
g. (Adm., Design, Support.)	(8.0)				
h. (Institutional Strengthening)	(5.3)				
2. Rural roads	**57.0**	**11.4**	**14.3**	**17.1**	**14.2**
TOTAL COST	**175.0**	**36.4**	**49.3**	**52.1**	**37.2**

The estimated costs are based on unit costs for similar civil works in irrigation and rural roads, and on recent bid estimates for equipment. Cost estimates are net of taxes, which would be borne by the government.

The total estimated cost of the proposed investments is **$175 million.** In irrigation, the estimated cost of investments is **$118 million** while in rural roads the estimated cost of investments is **$ 57 million.** Financing in the amount of **$175 million** is being sought from the MCA. In addition, the investment in irrigation forms part of a continuing investment program being supported by World Bank and IFAD funding while investments in rural roads will be supplemented by a World Bank Rural Infrastructure operation in 2005.

4.6. Monitoring and Accountability

Accountability. The financial accountability arrangements that would be used are similar to ongoing arrangements under World Bank- financed irrigation development and transport projects, modified to meet the specific requirements of MCA. In general, a financial management system will be documented in a Financial Management Manual (FMM). This document would include: (i) the project's financial management system which describes accounting and auditing policies, standards and internal controls; (ii) role of the financial management systems in project management and implementation; (iii) accounting arrangements required for project management, the format for and content of financial reporting; and (iv) the auditing arrangements to be in place during project implementation.

In order to facilitate timely implementation and payments to contractors, the government of Armenia will establish, maintain and operate a special account in a commercial bank acceptable to MCA. This account would need to be able to facilitate expenditures both in foreign and local currency. The administration of the special account would be the responsibility of the PIUs. Consideration should be given to whether more than one special account needs to be established for the two sector activities. The initial deposit in the special account should be equivalent to the estimated expenditures of the first quarter in the first year of implementation i.e. approximately $5 million.

Monitoring and Evaluating Progress. The monitoring and evaluation arrangements will be the responsibility of two entities as described in 4.1 and in Figure 4.:
(i) Board of Trustees for the MCA Proposal which would have responsibility for monitoring the broader impact of the investments on agricultural production, marketing access and water availability in rural communities, and in reducing rural poverty. The Board would prepare a mid-point report on progress in reducing rural poverty which would be delivered to the MCA no later than January 2008.A framework for monitoring progress of the irrigation component and the rural roads component is outlined below;
(ii) PIU, which will be responsible for monitoring overall implementation progress, in particular project inputs and outputs, and for preparing quarterly progress reports to the MCA.

5. SUSTAINABILITY STRATEGY

The elements of the government's strategy to sustain progress under the proposed MCA program are contained in its Letter of Development Policy of October 2004 to the President of the World Bank. This letter describes the government's medium-term economic reform program which would be supported by a series of Poverty Reduction Support Credits, provided the government maintains progress in carrying out a set of actions aimed at poverty reduction.

A key component of the government's reform program is maintaining the recent high levels of economic growth with low inflation levels, which it plans to do by remaining committed to macroeconomic stability, structural reform, and liberal economic policies that encourage continued private sector investment. Specific goals have been agreed to for 2007 for cumulative growth (25%), inflation levels (below 3%) and fiscal deficits (2-3% of GDP) which the government intends to meet. Similar goals have been agreed in public administration reform, aimed at strengthening tax and customs administration, improving governance, and strengthening public sector management.

A central theme of the government's reform program is modernization of Armenia's rural economy. Investment in both irrigation and rural roads are priority components of its program. In the irrigation sector, the government is planning to take steps to merge the currently separated ministerial responsibilities for irrigation development and drainage which has led to coordination difficulties. An important step recently taken is the management of Armenia's irrigation network which has been recently devolved to 54 regional water user associations. However, the technical, financial and managerial capacities of these associations are still weak so that training programs in water management, as well as in financial management and control, are urgently needed to build up their capacity. In this regard, the technical assistance funds being sought under the MCA proposal will be used for this purpose and will thus be important in sustaining the longer term viability of Armenia's irrigation network. In parallel to building up the capacity of the water user associations, the government is committed to improving cost recovery in irrigation from 50% in 2003 to 70% in 2007.

As a component of its strategy for rural infrastructure reform, the government intends to improve the access of rural communities to agricultural markets, storage, and processing facilities by investing in local roads. The government has committed itself by 2007 to reducing the share of rural roads in need of rehabilitation. To help achieve this goal, the government will ensure that adequate budgetary resources are allocated for rural roads and funding mechanisms are put in place to maintain them.

6. COMMITMENT TO MCA CRITERIA

Background. The government of Armenia remains committed to the key principles which established its eligibility for MCA assistance. These are (i) policies that deepen the democratic process, strengthen the judiciary, and encourage increased private sector involvement in the economy; (ii) the reduction of poverty through economic growth (iii) consultation processes that seek the participation of all representatives of civil society in decisions that affect their development; and (iv) a willingness to have progress towards fair

election processes, economic openness, and citizen participation monitored by independent observers. In each of these areas, the government is putting in place policies, processes, and monitoring systems aimed at advancing Armenia's progress towards a liberal democracy, a fully open economy, and a more just society in which all its citizens participate.

The government recognizes that it cannot have a fully functioning market economy without also having a liberal democracy in which laws are respected, there is fair competition in the market place, and where all citizens- irrespective of their political allegiances, personal wealth, or gender- can participate. Despite past difficulties in the electoral process, improvements are being made to improve voting processes at all levels, assisted by the presence of international observers. Steps are also being taken to improve the judicial system by putting in place an independent judiciary that is able to guarantee due process of law and has the confidence of the country's citizens. There is already a free, and mainly privately-owned, mass media to help ensure public access to all news as well as provide feedback to country's authorities. The government will encourage self regulation of the media's news to improve professional and ethical standards. Finally, in terms of participation of civil society in processes that affect their livelihood, the government will continue to build on the positive experience of the PRSP process in 2003 by encouraging participation, and subsequent feedback, from communities whose social and economic well being is the focus of government investment programs.

The set of eligibility criteria for MCA, i.e. **ruling justly, investing in people, and economic freedom**, together with the 16 performance indicators, link directly into the policy commitments made by the Armenian authorities for the country's medium and long-run development.

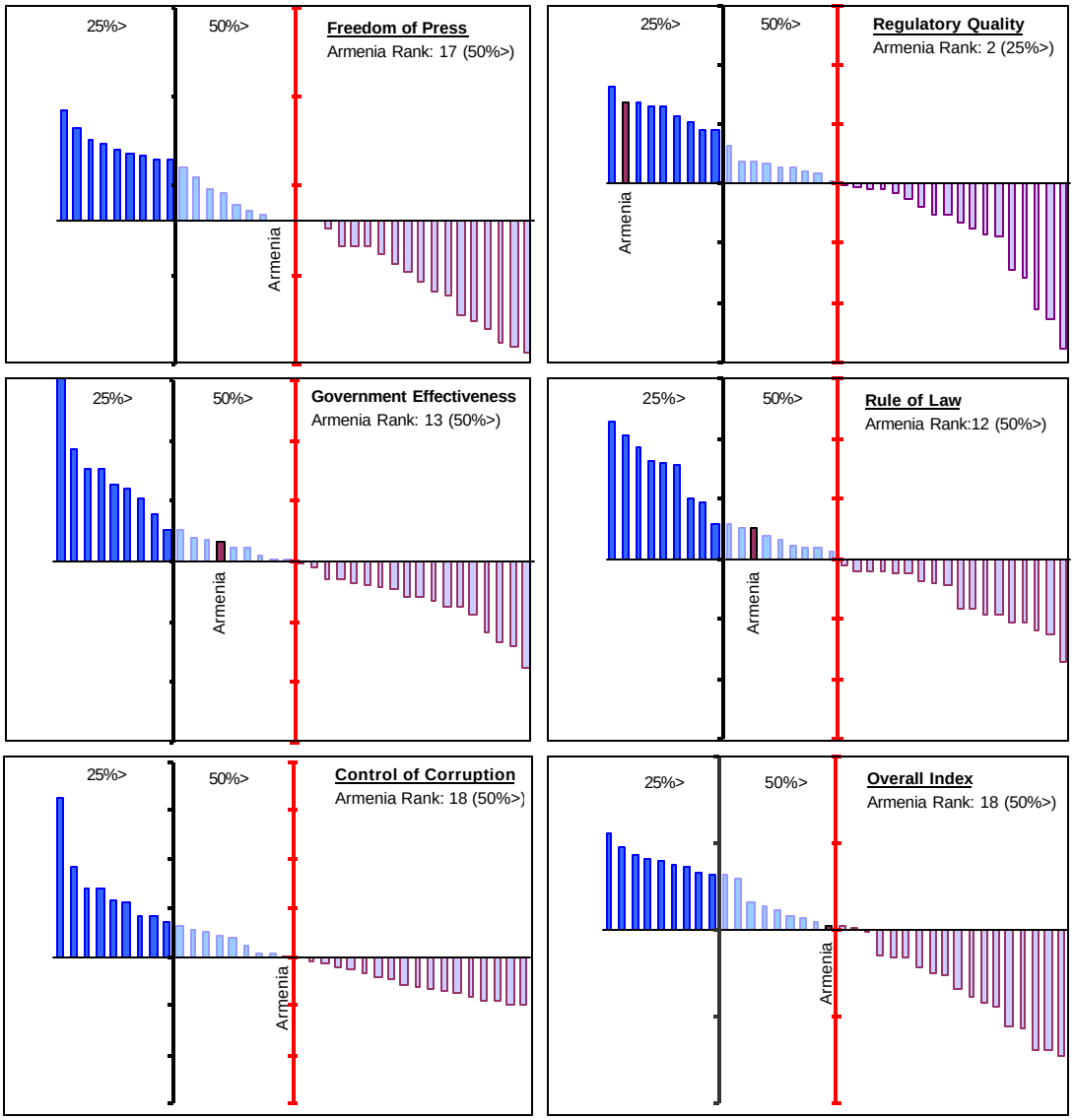
Ruling Justly: The government is putting in place policies, processes, and monitoring systems aimed at advancing Armenia's progress towards a liberal democracy and a more just society in which all its citizens participate. It remains strongly committed to improving governance and fighting corruption. Moreover, it believes that efforts made towards improved governance and institutional environment will considerably enhance the country's poverty reduction and economic development prospects. The government has followed up on this commitment by giving high priority to *improved core public sector functions* in its Poverty Reduction Strategy.

The government has also placed a special emphasis on fighting corruption and the corresponding measures it planned to take were documented in the anti-corruption strategy adopted by the government and presented to the public at the end of 2003. In addition, reforms to the judicial system, which are currently underway and actions aimed at improving tax and customs administration will make an important contribution to the enhancement of the business environment in the country and will increase the trust of both the private sector and the civil society in government institutions and policies.

The government intends to monitor its performance by using a clearly defined monitoring framework. In particular, the system of PRSP monitoring indicators includes Civil Exclusion and Inequality; Armenia's performance in this area will be monitored and evaluated by using 5 outcome and 27 explanatory indicators. It is worth mentioning that 3 out of 5 outcome indicators are the same as those under the Ruling Justly section of MCA

eligibility criteria, although the performance against corresponding targets will be assessed in slightly different manner.

Figure 5. Armenia PRSP Monitoring Framework: Social Exclusion and Inequality Outcome Indicators (Performance in 2002)



The five outcome indicators for Civil Exclusion and Inequality section of the PRSP monitoring indicators system are: (i) Freedom of Press, (ii) Regulatory Quality, (iii) Government Effectiveness, (iv) Rule of Law, and (v) Corruption Perception Index (or Control of Corruption)[31]. The government intends to take measures to enable it to rank amongst the upper 25% of those countries with nominal per capita GDP in the range of 1.5 -2.5 times Armenia's per capita GDP[32] . The recent ranking of Armenia is based on criteria presented in **Figure 5**.

[31] Sources for indicators are: (i) Freedom House; (ii)-(iv) World Bank Institute, and (v) Transparency International (or World Bank Institute).

[32] GDP per capita in Armenia, in nominal terms, amounted to US$ 1,104 in 2004 up from US$ 873 in 2003 and US$ 740 in 2002, respectively.

Investing in People: Economic collapse at the beginning of the 1990s negatively affected the performance in the health and education sectors. Public financing was reduced drastically while maintaining existing facilities and infrastructure became harder and the quality of the corresponding services deteriorated.

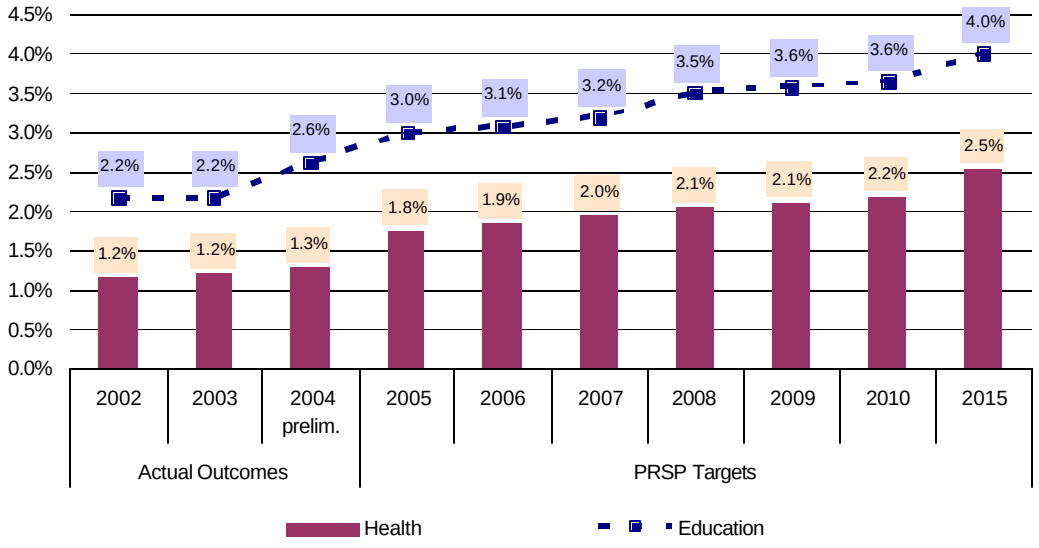
Starting in the mid-1990s, the government initiated a wide-range of reforms in the sectors aimed at improvement of the situation in these social sectors by addressing quality, accessibility and efficiency issues. The commitment of the government authorities was reflected in both overall socio-economic development and in sector programs. In particular, the Poverty Reduction Strategy, which provides the core framework for the socio-economic development policies of the government in the medium and long-run, clearly identifies *enhancing human development and improving social safety nets* as a key priority area for action.

In education, a key priority is assigned to secondary general education by addressing quality, equity and efficiency issues with clearly defined outcomes of increased years of schooling, higher secondary school completion rates and more equitable access to education services at upper secondary level.

In health, government policies are focused on increasing accessibility and improvements in the quality of essential health services. Both at the primary health and hospital levels, government is stressing child and maternal healthcare issues with the intention and defined measures to achieve corresponding Millennium Development Goals.

Prioritization of education and health sectors in economic growth and poverty reduction strategies correspondingly reflected in the government's programs to increase public expenditure. PRSP targets to increase public expenditure on education and health to 4% and 2.5% of GDP by 2015 up from 2.2% and 1.2% of GDP in 2002, respectively (see Figure 6). Government commitment to these targets was shown in the medium-term budget where 90% of the increase in budget resources in 2005 (as compared with 2004) have been allocated to education, health, and social assistance. In particular, projections of 2004 and 2005 annual budgets and 2004-2006 and 2005-2007 Medium Term Expenditure Frameworks (MTEF) are in-line with PRSP corresponding targets. Moreover, the government committed itself to making an additional inter-sectoral redistribution of public funds towards these sectors should additional resources not become available.

Figure 6. Public expenditure on education and health in 2002-2015, % of GDP



Source: Ministry of Finance and Economy; PRSP targets.

Economic Freedom: After a severe economic crisis in the early 1990s, Armenia had a strong economic performance, attributable to a macroeconomic stabilization program and to structural reform. As a result, Armenia currently is rated as one of the most liberal economies amongst the Central and Eastern European and CIS countries, and it became a full member of World Trade Organization in 2003.

At the same time, the government understands that further efforts towards macroeconomic stability and private sector development are crucial for sustainable economic growth in medium and long-term.

Thus, the government plans to undertake actions to promote strong economic performance in the medium to long-term, with expected annual GDP growth of 6% and inflation of 3% a year.

In regard to promoting a *better business and investment climate*, the government is committed to deepen its reforms to address weaknesses in tax and customs administration, increase public confidence in the banking and non-banking financial sector, particularly by taking measures to reduce the cost of business borrowing, improve the corporate governance of banks and payment systems. Despite the fact that conditions for starting a business, in broad terms, are favorable in Armenia, authorities intend to take actions to remove administrative barriers, which are still of concern to the private sector.

The government has continued to improve the business environment in Armenia. Further steps have been taken to reduce administrative bottlenecks while a number of new institutions have been created to assist new investors- among them, a Business Support Council and an Information Technology Council which are comprised of foreign and local businessmen as well as senior cabinet level officials. The progress made in improving the business environment is reflected in recent evaluations by both the Heritage Foundation and the Wall Street Journal whose rankings show Armenia to be the most open of the newly independent states and an improvement from a ranking of 115 in 1996 to 44 in 2003.

Starting 1995-1996, tight monetary policies allowed consumer price *inflation* to be brought under control and, in 1998-2002, the annual increase in prices was kept below the 3% target of the Central Bank of Armenia. However, during the last two years, some increase in consumer prices has taken place (mainly due to external factors) but the authorities are confident and committed to keeping inflation within the range of 3%, which has been set as a target for consumer price annual inflation for the medium-run.

The government is committed also to go further with its reforms in the area of fiscal policy and public expenditure management. With public expenditure constraints (in particular, given the targeted allocations in the social sector, physical infrastructure and core public services) in the medium-term, the government intends to keep the budget *deficit* in the range of 2-3% of GDP, which is consistent with macroeconomic stability. On the other hand, given the improved public debt position after an agreement with Russia on debt-for-equity swap in 2003, a budget deficit in the range of 2-3% of GDP will not affect seriously the public debt profile of the country.

The Armenian government remains confident that the above-mentioned policy measures together with other economic and social policies will create an environment conducive for private led economic growth while maintaining an equitable distribution of benefits, hence ensuring the overall success of MCA assisted investment in the proposed investment areas.

Government Action Against Corruption. Corruption amongst civil servants continues to be a problem as is also the prevalence of corruption in business dealings, financial transactions, and bidding processes. It is expected that more rigorous and transparent recruitment procedures, accompanied by firm sanctions against offenders, will start to reduce the incidence of corruption amongst civil servants. The government is aware that the perception amongst prospective investors of a high incidence of corruption in Armenia deters new investment but remains committed to eliminating corrupt practices in all areas of the economy; at the same time, it recognizes that this is a process that will take time. In this regard, it has been encouraged by Armenia's steady improvement in the annual country rankings of Transparency International, where it was ranked 82 out of 146 countries surveyed, a performance that was superior to the average for the CIS countries.

The following measures have been taken by the government in the context of its fight against corruption:

1. **Government's Decree No 1522-N "On Approving the Anti-Corruption Strategy of the Republic of Armenia and its Imple mentation Action Plan", dated November 6, 2003.**
2. **Anti-Corruption Strategy Implementation Monitoring Committee**
3. **The Implementation Action Plan.** This plan incorporates a series of more than eighty time bound specific actions. Each action has a responsible party and is supervised by both the executive authorities and by non-governmental structures. This Action Plan is aimed at dealing with corruption in the following areas: (i) Economic sector, including the banking, tax and customs systems, health care, education and public finance, property and privatization areas; (ii) Political corruption; (iii) Corruption in the system of public administration; (iv) Corruption in law enforcement and judiciary systems.

7. FUTURE AREAS FOR MCA COMPACT SUPPORT

The present proposal represents a first step of priority investment areas for which MCA support is being sought by the government of Armenia. Assuming Armenia continues to MCA eligible in FY 2006, the government plans to present additional investment proposals that are important for Armenia's future economic development within the framework of the Compact between Armenia and the MCC. The next proposal would likely involve a series of investments in transport that include the rehabilitation of the railways network and a new E-W road to the Georgian border, designed to improve transport modes and to facilitate growing trade within the region. This proposal would be presented during 2006.

8. GOVERNMENT REPRESENTATIVE

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9. TRANSPARENCY

The government plans to follow a similar strategy to that adopted in making the PRSP a public document. First, there would be broad circulation of the Compact document in the Armenian language throughout the country. Second, the Compact would be made available to the public through the internet on the MCA website. Finally, discussions and roundtables would be held in all marzes of Armenia outlining the investment plans intended to benefit particular communities. In these discussions, steps would be taken to ensure that representatives from communities in project areas are present.

ANNEX 1. IRRIGATION COMPONENTS

Summary of Benefits and Costs

The main expected benefit of the component is to improve the productivity and the sustainability of irrigated agriculture through:

Component a. Conversion from pumping to gravity irrigation.

Out of 35 schemes analyzed against economic viability 19 schemes covering about 24,454 ha selected with expected satisfactory economic results (ERR above 10 %). The without project situation would lead to a progressive decrease in irrigated areas, as pumping infrastructure continues to deteriorate as it has over the past ten years. This process is assumed to take 10 additional years (before the pumps malfunction) during which time, irrigated crops would be replaced by rain-fed ones where possible or unplanted when the low rainfall does not allow any crop. With project, normal irrigated agriculture would be maintained in the areas. The supply of water to four gravity schemes will be ensured by building water reservoirs with a capacity of 11.6 million cubic m. An additional benefit to the system would be elimination of consumption of about 19.7 million kWh. Although, the monitoring and impact assessment conducted for previously built gravity systems reveal that in the first years, after the end of construction, farmers begin to establish new plantations of grape, fruits and other highly profitable crops and/or in some regions with mild climates, farmers started to collect two harvests from lands under gravity irrigation (they grow maize after winter cereals), no additional benefit from expected change in crop patterns has been assumed. The estimated cost of selected schemes amounted to US$32.4 million.

Component b. Construction of water reservoirs.

It is planned to build 4 water reservoirs with a total volume of 8.4 million cubic m. This will allow for increasing irrigated areas by 2000 ha. The cost of implementation of this component is estimated at US$8.4 million. Water reservoirs were selected based on the economic effectiveness of construction (ERR not less than 10 percent), or the possibility of alternative and more economical water supply to the area.

Component c. Restoration of pumping stations.

It is planned to restore 76 pumping station, supplying water to 22 selected WUAs. 66 of the 76 pumping stations supply water to WUAs, and 10 stations provide water from the source to the organization responsible for water supply, i.e. "Vorogumjrar" CJSC. Implementation of the proposed measures will save 39.1 million kWh of electricity per year. Electricity savings will result from more efficient operation of pumps after their restoration. Currently, the over-consumption of electricity in pumping stations is around 30 percent. If the volumes of water supplied remain the same, the annual increase in over-consumption of electricity will constitute 4 percent. Since some pumping stations do not operate to their full capacity or do not operate due to being out of order, their restoration will allow for an increase of irrigated lands by 5,768 ha, which were not irrigated previously. The cost of implementation of this component is estimated at US$14.8 million.

Component d. Restoration of tertiary irrigation canal network.

It is planned to restore irrigation systems on 28,116 ha of land on the territory of 22 selected WUAs. According to the monitoring of WUAs operation, water losses in irrigation networks are 30-50 percent, and the national average amounts to 41 percent. Losses in networks increase by 2 percent annually. Implementation of the program will reduce losses in tertiary canal network down to 20 percent, which is the optimum loss for some large systems. The calculation of the investment costs needed for achieving the proposed objective were done based on the example of Artashat WUA.

The WUA has 346 km of irrigation networks. Losses in the network in 2004 amounted to 42 percent. Considering the objective set (reduce losses in networks to 20 percent) 22 percent of the loss should be eliminated, or 76.1 km of irrigation networks should be restored. According to the practice of restoration of similar networks, the cost of restoration is around US$15,000 per km. Accordingly, US$1.14 million is needed for the mentioned reduction of losses in irrigation networks of Artashat WUA. The 76.1 km network covers an area of 1,280 ha. Investments needs of all the 22 WUAs were calculated by a similar method. Other than the reduction of losses in the system, the restoration of irrigation systems will allow for irrigating additional previously non-irrigated areas (because of lack of water) and increasing the volume of water supply to irrigated lands. The cost of implementation of this component is estimated at US$24.5 million.

Component e. Rehabilitation of Drainage System in Ararat Valley.
It is planned to rehabilitate more than 500 km of main drain-canals, 250 draining tube-wells, 11 pumping stations which are serving around 30,000 hectare of lands in Ararat valley. Rehabilitation of the system costs $12.7mn and will allow to improve land-reclamation state of the lands of 10 WUAs in Armavir and Ararat marzes. More than 150,000 of population will benefit from better conditions for farming and sanitary-medical conditions, around 50% of energy will be saved, additional water will be available for irrigation and will prevent further salinization of lands.

Component f. Rehabilitation of Primary Canals.
It is planned to rehabilitate 4 primary canals (more than 110 km) which are located in 5 marzes and are supplying water to 20 WUAs. Annually more than 110 Mm^3 (which is around 30% of the total intake) is lost. Rehabilitation will allow to reduce water losses from 30% to 10%. Rehabilitation will cost $12mn.

Component g. Institutional Strengthening.
It is planned to provide intensive training and equipment to 54 WUAs and State Water Supply Agency which will improve operational efficiency of water management throughout the irrigation network. This component costs $5.3mn over 4 years.

Economic analysis
Introduction

Since the main part of the benefits of the Program are linked to agricultural production, in order to assess the situation and the potential impact of program implementation on farms, the results of the monitoring and evaluation of WUAs operations in 2003-2004 in four agro-economic zones (subtropical, valley, hilly, mountainous) were used. The analysis is based on the crop budgets in various situations and shows the advantages of irrigated farming as opposed to rain-fed farming. These models were formed as a result of the monitoring and evaluation of WUAs operation on the entire territory of the country. The models represent different situations of irrigation and operations of pumping stations.

Expected benefits and main assumptions

The main expected benefit from the implementation of the Program is the increase in productivity and efficiency of agricultural activities, as well as reduced cost of irrigation water service and delivery, through:

a. Conversion of mechanical irrigation into gravity irrigation on 24,454 ha

Monitoring conducted in recent years reveals that the conditions of mechanical irrigation (pumping) worsen by the year. Due to limited resources, there is no possibility for replacing pumps or repairing them up to normative conditions. The electricity consumed is currently subsidized from the state budget. Accordingly, the baseline scenario is one of acceleration of the reduction in irrigated areas. It is assumed that this process will take 8 more years (until the complete breakdown of pumps), as a result of which irrigated lands, where possible, will become rain fed (agro-economic zones 2, 3 and 4) or will be abandoned (agro-economic zone 1). With the project scenario, full irrigation of areas covered by pumping stations will be restored. An additional benefit of implementing the activities is the reduction in the cost of irrigation water service and delivery, as well as subsidies from the state budget and operation costs. As a result of the implementation of the project, with the project scenario, pumping stations will be dismantled and the electricity consumption of those stations estimated at 53.2 million kWh will be saved. During the analysis it was assumed that pumps currently operate at their design capacity and irrigate the areas they cover.

b. Construction of reservoirs.

Building water reservoirs allows for irrigating new lands. The main benefit for the given situation is the generation of agro-economic incomes from new lands, depending on the location of land by agro-economic zones.

c. Restoration of pumping stations

As mentioned in section (a), due to limited resources, it is not possible to replace the pumps or repair them up to their normative conditions, and as a result currently around 100 pumping stations from among the existing 420 stations are not used. As studies showed, due to their worn-out equipment, pumping stations have around 30 percent over-consumption of electricity in order to deliver the needed volume of irrigation water to the areas they cover. If the current conditions of operation of pumping stations remain the same, with the baseline scenario, the over-consumption of electricity will rise. Due to the limited possibilities for the full restoration of pumps, with the baseline scenario, the increase in over-consumption of electricity will amount to 2 percent per year (according to the results of monitoring in the last 13 years). This assessment is made based on the assumption that the land area under mechanical irrigation will remain unchanged. The analysis was based on the assumption that operation costs will increase by 2 percent of investments on the restoration of pumps. Some pumping stations, due to their extremely worn-out pumps, deliver water to 20-25 percent of the area they cover. For such pumping stations (for 6 WUAs), benefits were calculated using the method for gravity irrigation with the addition of electricity costs.

d. Rehabilitation of tertiary irrigation canals.

The monitoring of in-farm irrigation systems (tertiary irrigation canals) revealed that irrigation networks on 75,000 ha are in poor conditions and 56,000 ha is not irrigated due

to lack of water. The average losses in the system amount to 41 percent. Considering the mentioned facts, it is assumed that due to losses in networks certain areas are not irrigated and are rain-fed. Water losses in networks vary from 25 to 55 percent. In the valley agro-economic zone, it is impossible to grow agricultural crops without water. This component envisages the restoration of irrigation networks covering 28,100 ha. It is assumed that proportional to the percentage of losses, conditionally, previously irrigated lands are in rainfed conditions. If the current operational capacities of irrigation systems remain unchanged, with the baseline scenario, the annual increase in rainfed lands will constitute 2 percent. After the implementation of component activities, water losses in the system will constitute 20 percent.

e. Rehabilitation of Drainage System in Ararat Valley

Rehabilitation of the Drainage System in Ararat valley will allow to improve the land-reclamation state of more than 30,000 hectares and more than 150,000 of rural population in Ararat valley will benefit from better conditions for farming and sanitary-medical state. Because of elimination of some pumping stations and rehabilitation of the other pumps and tube-wells annually more than 8 million Kwh (or around 50% of total consumption) of energy will be saved. Deepening of the main drains will increase the level of the ground-water table which will stop further salinization. As a result of restoration of vertical drainage, more than 20Mm^3 of additional water will be available for irrigation of the lands. The economic rate of return for this investment was estimated to be 20.2% based on a capital investment of $12.7mn over 3 years and calculating the benefits to be increased, higher value crops and energy savings.

f. Rehabilitation of Primary Irrigation Canals

As a result of bad technical state of the main irrigation canals irrigation of more than 100 thousand hectares are under the risk and 110 Mm^3 (around 30% of total intake) of water is lost annually. The Rehabilitation of the following canals is considered to be a priority based on water savings and overall economic and social benefits:

Of these 4 investments, the first three ($ 10.6mn) were selected given their high ERRs and the water resource conservation/environmental importance of the Arzni Shamiram works for water from Lake Sevan; the small component for Shirak ($1.4 mn) was also included because of potential benefits to very low income farmers in this *marz*. The estimated total investment for main channel rehabilitation works would thus be $12 mn.

	Name of the system	Length of the main and secondary channels (km)	Cost (mln. USD)	Irrigated areas (thousand ha)	Actual water losses (mln. cub. m.)	Water saved by the project (mln. cub.m.)	ERR %
1	Arzni Shamiram	28.6	4.6	26.1	30.8	22.7	**17.4**
2	Talin	50.0	4.7	19.2	64.3	45.8	**30.1**
3	Artashat	17.2	1.3	19.5	12.90	9.0	**22.0**
4	Shirak	15.4	1.4	21.9	5.8	4.6	**14.7**
	Total	**111.2**	**12**	**86.7**	**113.8**	**82.1**	

g. Institutional Strengthening

A quantitative rate of return was not calculated for this component because of a lack of clear methodology. The sub-components are presented below:

	Subcomponents	Required quantity	Total cost (thousand USD)
	For State Water Supply Agency		
1.	International Legal Consultant for	3 months	70.0
2.	Operational vehicles for four branches	36	440.0
3.	Mechanisms (excavators, bulldozers, dump-body truck, dragline)	32	1300.0
4.	Equipment and communication means	-	180.0
	For Water Users Associations		
5.	Construction and technical supplementation of the training center		500
6.	Continuation of the training program		500
7.	Hoisting cranes	10	300
8.	Excavators (with 0.25m^3 ladle)	30	600
9.	Excavator (with 0.5m^3 ladle)	6	270
10.	Bulldozers	8	360
11.	Dump-body trucks	5	150
12.	4 trucks with handling wheels	20	180
13.	Operational vehicles	10	50
14.	Construction of WUAs offices	15	375
	Total		**5275**

Crop budgets

Crop budgets were prepared based on the monitoring and evaluation of WUAs in 2004 and prices were obtained through surveys of farms. The entire territory covered by the program was differentiated into 4 agro-economic zones (valley, upland, high mountainous and subtropical), in three of which (except valleys) rainfed farming is possible. Composition of crops, yields, incomes per hectare by crops and by zones are presented in tables below

Crop budgets by agro-economic zones

CROP BUDGET	VALLEY (ZONE 1)		HILLY (ZONE 2)		MOUNTAINOUS (ZONE 3)		SUBTROPICAL (ZONE 4)	
	Non-irrigated	Irrigated	Non-irrigated	Irrigated	Non-irrigated	Irrigated	Non-irrigated	Irrigated
Wheat		42.0%	50.3%	23.7%	65.0%	54.5%	60%	16.3%
Vegetables		20.1%	-	9.6%	-	5.9%	-	8.8%
Potato		4.6%	-	0.6%	-	27.4%	-	2.1%
Alfalfa		8.3%	49.7%	31.6%	35.0%	10.5%	40%	-
Fruits		16.9%	-	25.9%	-	1.7%	-	43.5%
Grape		8.1%	-	8.5%	-	-	-	29.4%
Total		100%	100%	100%	100%	100%	100%	100%

Crop yield and net income by agro-economic zones

	YIELD (KG PER HA)		NET INCOME (US$ PER HA)	
	Non-irrigated	*Irrigated*	*Non-irrigated*	*Irrigated*
Valley				
Wheat		3350		470
Vegetables		37810		2098
Potato		30750		4196
Alfalfa		11920		75
Fruits		5600		1631
Grapes		12410		3596
Weighted average				**1385**
Hilly				
Wheat	1200	2760	57	303
Vegetables	-	16200	-	141
Potato	-	13000	-	540
Alfalfa	3000	7000	13	14
Fruits	-	11850	-	4297
Grapes	-	5860	-	1291
Weighted average				**1316**
Mountainous				
Wheat	1400	2570	116	286
Vegetables	-	22500	-	992
Potato	-	21070	-	2110
Alfalfa	2500	6200	12	57
Fruits	-	6100	-	1265
Weighted average				**820**
Subtropical				
Wheat	2300	6000	366	1137
Vegetables	-	28700	-	2615
Potato	-	19700	-	1436
Alfalfa	3000	-	35	-
Fruits	-	10000	-	4243
Weighted average				**2328**

Financial and economic prices

As mentioned above, financial prices are farm prices at the time of program preparation. For the economic analysis, financial prices were replaced by economic ones, in order to reflect the real indicators of investments and production in the country. The main imported products are wheat and fertilizers. Parity prices of their import was calculated based on current international prices. Significant differences between financial and economic prices were not discovered (replacement factors varied between 98.8 and 130 percent), which is an indication of the absence of subsidies influencing the local market price formation of these products. The other main agricultural products, relating to the program, are mainly sold in local markets: vegetables, fruits, forage crops for local livestock, grape for local processing into wine and cognac. The conversion factor was assumed equal to 1. similarly, a conversion factor of 1 was applied to investment expenditures.

The economic value of family work was estimated as 1500 Armenian drams (US$3) per day, which equals the average wage of unskilled labor in the country.

The methodology and results of the analysis of components

Separate analysis was done for each of the first 4 components of the Program. Two components (transition from mechanical to gravitational irrigation, building water

reservoirs) consist of a number of sub-programs (facilities), for which separate analysis was done for their selection (excluding economically inefficient ones). Thereafter the ERRs for the selected activities were summarized. Two components (restoration of pumping stations, restoration of irrigation networks) were calculated after the grouping of the main indicators for each selected WUA. For each of these 4 components of the program, analysis is based on two options, i.e. baseline scenario and project scenario. Those scenarios are based on the main assumptions presented above, and summarized at the initial stage of the separate analysis of each component.

Economic analysis of transition from mechanical to gravitational irrigation.

CURRENT SITUATION	BASELINE SCENARIO	PROJECT SCENARIO
Partial use of pumps due to their poor conditions and high cost of pumping water. Part of the territories covered by stations have already become rain fed or are not used.	Mechanical irrigation is difficult due to the poor conditions of pumps and high cost of pumping water. It is not possible to replace pumps and their use will be scaled down within 8 years until their total breakdown (if they are not already broken down). The share of rain fed (or unused) lands will amount to 100 percent of lands covered by stations in 8 years time.	Mechanical irrigation is replaced by gravitational irrigation. Irrigated lands reach the level prior to the worsening of indicators and composition of crops will be similar to indicators and composition of the crops on territories presently irrigated. Electricity savings will correspond to the its consumption in the first 8 years, when pumps would be operating in accordance with the baseline scenario.

Calculations based on these assumptions were made for each of the 19 systems, which were proposed for transition from mechanical to gravitational irrigation. ERRs vary between 17.6 and 88.3 percent. The indicator for economic effectiveness basically depends on the ratio of the cost of investments and the area which has switched to gravitational irrigation. The program includes only those schemes, for which the ERR is higher than 15 percent. Component's ERR is estimated at 42.3 percent. The cost of building all the gravitational irrigation systems was estimated at US$32.4 million. Despite the fact that according to the design calculations for systems, they should have used 53.2 million kWh of electricity per year, they practically used only 19.7 million kWh (source: monitoring of the operations of pumping stations). Due to partial operation of pumping stations, from the 24,454 thousand ha of land area covered by stations only 59 percent, or 14.4 thousand ha were irrigated. As a result, the implementation of the program will allow for irrigating 14.4 thousand ha of rain fed lands and, in effect, save 19.7 thousand kWh of electricity annually.

Restoration of pumping stations

CURRENT SITUATION	BASELINE SCENARIO	PROJECT SCENARIO
Partial use of pumps due to their poor conditions and high cost of pumping water. Part of the territories covered by stations have already become rain fed or are not	Mechanical irrigation is difficult due to the poor conditions of pumps and high cost of pumping water. It is not possible to replace pumps and ensure their normative operation, and as a result electricity consumption needed for irrigating the areas	Pumping stations are restored and operate at their design capacity. The area of irrigated lands reaches the design volume. Electricity savings on average amount to 30 percent of the electricity consumed in 2004. In 6 WUAs, previously non-irrigated lands will reach the level prior to the

used. Due to the low efficiency of pumps, the cost of irrigation water service and delivery rises.	covered increases by 4 percent annually. The cost of irrigation water service and delivery increases.	worsening of indicators and composition of crops will be similar to indicators and composition of the crops on territories irrigated today.

Proposals for restoration of pumping stations were groups by 19 WUAs. For each WUA, analysis was done and the economic viability of restoring pumping stations was evaluated. ERRs vary between 11.5%and 173.7% percent. The indicator of economic effectiveness basically depends on the ratio of investment costs and electricity consumption. The program includes only those schemes, for which the ERR is higher than 10% percent. Component's ERR is estimated at 44.3% percent. The cost of restoring pumping stations is estimated at US$14.8 million.

Restoration of in-farm irrigation canals

CURRENT SITUATION	BASELINE SCENARIO	PROJECT SCENARIO
There are water losses, which are estimated for each WUA. Irrigated areas reduce annually.	Due to continuous deterioration of canals, annual increase in losses of water and irrigated lands amounts to 2 percent. The cost of irrigation water service and delivery increases.	Reduction in water losses to 20 percent. Increased water supply to irrigated lands. Part of the previously rain fed lands brought under irrigation and reach the level prior to the worsening of indicators. Composition of crops and yields per crop assumed equal to those in similar territories which are irrigated today.

For each WUA, analysis was done and the economic effectiveness of restoring irrigation networks was evaluated. ERRs vary between 20.7%and 112.4% percent. The indicator of economic effectiveness basically depends on the ratio of investment costs and percentage of losses in the network. The program includes only those proposals, for which the ERR is higher than 15% percent. Component's ERR is estimated at 43.0% percent. The cost of restoring pumping stations is estimated at US$24.5 million.

Building water reservoirs.

Economic analysis was done for each water reservoir. The program includes only those water reservoirs, for which the ERR is higher than 10 percent. The program includes 4 water reservoirs. The ERR is between 13.0 and 42.0 percent. Component's ERR is estimated at 23.3%percent. Other than water reservoirs included in the component, 4 reservoirs are included in the "Transition from mechanical to gravitational irrigation" component.

Sensitivity analysis

The sensitivity analysis was conducted by using the following variables:

- increase in cost by 30 percent;
- reduction in incomes by 30 percent;

- delay in implementation of activities for 2 years, which would lead to a delay of 2 years in receiving incomes.

Sensitivity analysis for 4 components (EIRR)

	CONVERSION FROM PUMPING INTO GRAVITY IRRIGATION	RESTORATION OF PUMPING STATIONS	REHABILITATION OF TERTIARY CANALS	CONSTRUCTION OF RESERVOIRS	Total
Base case	42.3%	44.3%	43.0%	23.3%	41.4%
Costs Increased by 30%	35.1%	31.7%	33.6%	17.8%	32.6%
Benefits Decreased by 30%	32.8%	27.8%	30.7%	16.1%	29.9%
Two Year Implementation Delay	29.0%	24.3%	27.0%	16.5%	26.5%

Program's economic impact on WUAs and farms

The expected additional profits for WUAs and farms will result from the implementation of the following measures.

For farms:

- Transition to gravitational irrigation. 14.4 thousand ha of rain fed lands become fully irrigated;
- Building new water reservoirs will allow for the gravitational irrigation of an additional 2.0 thousand ha;
- Restoration of pumping stations will allow for switching 7.1 thousand ha of rain fed lands to full irrigation;
- Restoration of in-farm networks will conditionally allow for irrigation of an additional 6.2 thousand ha.

As a result, cultivated areas will increase by an additional 29.7 thousand ha. Incomes per 1 WUA member resulting from the implementation of the program were calculated for each WUA.

For some WUAs, the increase in incomes of farmers exceeds the existing levels. For example:

- For Spandaryan WUA, the increase in irrigated lands will amount to 140 percent, and farmers' incomes will increase by US$2018;
- For Shenik WUA, the increase in irrigated land per one WUA member will constitute 1 ha, and the increase in income per member will be US$1291;
- For Martuni WUA, the increase in irrigated land will constitute 68%, and the increase in farmers' incomes will be US$503.

For WUAs:
Transition to gravitational irrigation will save 19.7 million kWh of electricity annually;
Due to increase in the efficiency of the restored pumping stations, 39.2 million kWh of electricity will be saved per year.

As a result, the total electricity savings will amount to around 58 million kWh per year.

ANNEX 2. IRRIGATION PROJECT BY COMPONENT, MARZ AND WUAs*

	Water Users Associations by Marz	Number of communities		Service area, ha		Number of water users		Component a: Conversion from pump to gravity irrigation				Component b: Construction of Reservoirs			Component c: Rehabilitation of Pump Stations				Component d: Rehabilitation of tertiary irrigation canals			TOTAL		
		Total	Covered by the project	Total	Covered by the project	Total	Covered by the project	Investment cost, mn US$	Area, ha	Electricity saving, mn kWh	ERR(%)	Investment cost, mn US$	Area, ha	ERR (%)	Investment cost, mn US$	Electricity consumption, thousand kWh	Electricity saving, mn kWh	ERR (%)	Investment cost, mn US $	Area, ha	ERR (%)	Investment cost, mn US $	Area, ha	Electricity saving, mn kWh
I	**Ararat Marz**	**92**	**76**	**36,526**	**8,264**	**63,206**	**13,074**	**2.06**	**1,575**	**9.3**		**0.00**	**0**	**0.0%**	**4.85**	**53,003**	**15.9**		**7.15**	**6,831**		**14.1**	**8,406**	**25.2**
1	Azat	14	11	3,779	918	6,391	1,466	0.00														0.0	0	0.0
2	Artashat	16	14	5,816	917	10,000	1,488	0.85	285	6.5	31.2%				1.27	14,467	4.3	21.5%	1.14	1,280	42.7%	3.3	1,565	10.8
3	Mkhchyan	19	16	5,908	1,346	11,016	2,577	0.00							1.01	15,747	4.7	28.2%	1.41	1,536	47.2%	2.4	1,536	4.7
4	Ararat	11	11	9,055	1,954	9,764	2,115	0.00							2.00	19,331	5.8	18.5%	1.12	1,630	47.2%	3.1	1,630	5.8
5	Vedi	12	10	5,906	2,442	8,706	3,651	1.21	1,290	2.8	57.2%				0.57	3,458	1.0	11.6%	2.54	1,477	24.8%	4.3	2,767	3.8
6	Masis	20	14	6,062	687	17,329	1,777	0.00							0.00	0	0.0		0.94	909	29.1%	0.9	909	0.0
II	**Armavir Marz**	**106**	**90**	**56,629**	**23,379**	**72,808**	**31,712**	**0.97**	**2,150**	**4.5**		**0.00**	**0**	**0.0%**	**5.10**	**63,952**	**19.2**		**9.20**	**10,209**		**15.3**	**12,359**	**23.6**
1	Khoy	13	10	5,084	1,883	9,768	3,421	0.00							1.37	19,824	5.9	28.3%	1.00	1,779	96.5%	2.4	1,779	5.9
2	Vagharshapat	12	9	4,909	2,235	7,220	3,322	0.00							1.65	23,666	7.1	28.1%	1.07	1,424	62.4%	2.7	1,424	7.1
3	Musaler	6	6	3,009	1,989	7,372	5,155	0.00														0.0	0	0.0
4	Aknalich	12	10	5,549	2,572	9,507	4,481	0.00							0.39	4,889	1.5	25.0%	0.50	888	52.1%	0.9	888	1.5
5	Sev Jur-Akhtamar	7	7	3,171	2,125	2,499	1,772	0.00														0.0	0	0.0
6	Merdzapnya	15	12	8,402	2,073	12,231	3,193	0.00							0.00	0	0.0		1.86	2,016	44.1%	1.9	2,016	0.0
7	Araks	14	13	7,529	3,321	9,791	4,570	0.00							0.55	5,157	1.5	18.6%	2.27	1,581	26.3%	2.8	1,581	1.5
8	Armavir	14	11	5,949	2,799	8,111	4,037	0.00							0.83	7,200	2.2	18.1%	1.41	1,011	23.6%	2.2	1,011	2.2
9	Karakert	4	4	3,592	805	4,688	1,111	0.00														0.0	0	0.0
10	Shenik	9	8	9,435	3,577	1,621	650	0.97	2,150	4.5	85.2%				0.32	3,216	1.0	20.8%	1.08	1,510	42.1%	2.4	3,660	5.4
III	**Kotayk Marz**	**60**	**51**	**20,675**	**6,051**	**34,470**	**11,339**	**3.64**	**1,365**	**7.6**		**0.00**	**0**	**0.0%**	**0.33**	**332**	**0.1**		**1.60**	**3,023**		**5.6**	**4,388**	**7.6**
1	Kotayk	21	19	5,500	1,401	9,131	2,285	0.84	235	1.7	21.8%				0.31	326	0.1	34.1%	0.96	1,595	68.6%	2.1	1,830	1.8
2	Hrazdan-Jur	12	9	4,722	1,020	6,761	1,394															0.0	0	0.0

* This table includes data on only components a, b, c and d

	Water Users Associations by Marz	Number of communities		Service area, ha		Number of water users		Component a: Conversion from pump to gravity irrigation				Component b: Construction of Reservoirs			Component c: Rehabilitation of Pump Stations				Component d: Rehabilitation of tertiary irrigation canals			TOTAL		
		Total	Covered by the project	Total	Covered by the project	Total	Covered by the project	Investment cost, mn US$	Area, ha	Electricity saving, mn kWh	ERR(%)	Investment cost, mn US$	Area, ha	ERR (%)	Investment cost, mn US$	Electricity consumption, thousand kWh	Electricity saving, mn kWh	ERR (%)	Investment cost, mn US $	Area, ha	ERR (%)	Investment cost, mn US $	Area, ha	Electricity saving, mn kWh
3	Jrvej-Dzroaghbyur	7	7	1,356	1,160	4,440	3,672	2.80	1,130	5.8	27.7%											2.8	1,130	5.8
4	Nairi	11	8	3,148	1,250	6,027	2,329	0.00														0.0	0	0.0
5	Eghvard	9	8	5,949	1,220	8,111	1,659	0.00							**0.02**	**6**	**0.0**		0.64	1,428	78.1%	0.7	1,428	0.0
IV	**Aragatsotn Marz**	**101**	**88**	**34,264**	**17,509**	**40,036**	**19,478**	**3.00**	**2,879**	**6.6**		**7.14**	**1,430**		**2.15**	**9,465**	**2.8**		**2.89**	**2,956**		**15.2**	**7,265**	**9.4**
1	Ashtarak	6	6	4,399	1,230	5,413	1,551	1.23	740	3.4	37.5%											1.2	740	3.4
2	Amberd	11	11	1,707	1,707	3,457	3,180					4.57	600	13.0%								4.6	600	0.0
3	Kasakh	7	6	3,325	1,304	2,206	489	0.28	189	0.8	39.6%											0.3	189	0.8
4	Shamiram	9	9	6,151	2,258	6,128	2,275	0.00							0.26	1,638	0.5	13.2%	1.45	1,353	32.2%	1.7	1,353	0.5
5	Parpi	9	7	3,595	918	6,200	1,310	0.00														0.0	0	0.0
6	Aparan	21	18	3,063	2,322	6,458	4,259	1.49	1,950	2.4	60.0%	1.21	480	42.0%								2.7	2,430	2.4
7	Talin	24	22	8,435	6,320	7,226	5,354	0.00							1.89	7,827	2.3	28.3%	1.45	1,603	34.2%	3.3	1,603	2.3
8	Mush	14	9	3,589	1,450	2,948	1,060	0.00				1.36	350	29.1%								1.4	350	0.0
V	**Shirak Marz**	**74**	**61**	**20,525**	**6,726**	**17,919**	**5,508**	**6.19**	**5,372**	**8.9**		**1.23**	**570**		**0.00**	**0**	**0.0**		**0.00**	**0**		**7.4**	**5,942**	**8.9**
1	Shir-Vorogum	13	10	5,598	1,268	2,715	1,109	0.00														0.0	0	0.0
2	Aygabats-Vorogum	21	16	5,171	1,361	3,290	1,163	0.14	224	0.3	49.2%											0.1	224	0.3
3	Ajapnyak-Vorogum	19	19	6,295	2,452	4,108	1,693	4.75	3,108	7.8	26.8%											4.8	3,108	7.8
4	Aragats-Vorogum	21	16	3,461	1,646	7,806	1,543	1.30	2,040	0.8	44.6%	1.23	570	29.7%								2.5	2,610	0.8
VI	**Lori Marz**	**32**	**24**	**9,085**	**3,921**	**9,618**	**4,363**	**1.64**	**1,548**	**3.0**		**0.00**	**0**	**0.0%**	**0.00**	**0**	**0.0**		**0.00**	**0**		**1.6**	**1,548**	**3.0**
1	Getik	13	9	3,381	1,428	5,489	2,454															0.0	0	0.0
2	Lori Canal	19	15	5,704	2,492	4,129	1,909	1.64	1,548	3.0	33.6%											1.6	1,548	3.0
VII	**Tavush Marz**	**43**	**41**	**18,133**	**5,640**	**15,447**	**5,362**	**0.20**	**150**	**0.4**		**0.00**	**0**		**1.13**	**1,014**	**0.3**		**0.75**	**1,933**		**2.1**	**2,083**	**0.7**
1	Kndzorut	5	5	1,460	828	2,079	1,248	0.00														0.0	0	0.0
2	Hakhum	3	3	1,689	552	939	325	0.00														0.0	0	

	Water Users Associations by Marz	Number of communities		Service area, ha		Number of water users		Component a: Conversion from pump to gravity irrigation				Component b: Construction of Reservoirs			Component c: Rehabilitation of Pump Stations				Component d: Rehabilitation of tertiary irrigation canals			TOTAL		
		Total	Covered by the project	Total	Covered by the project	Total	Covered by the project	Investment cost, mn US$	Area, ha	Electricity saving, mn kWh	ERR(%)	Investment cost, mn US$	Area, ha	ERR (%)	Investment cost, mn US$	Electricity consumption, thousand kWh	Electricity saving, mn kWh	ERR (%)	Investment cost, mn US $	Area, ha	ERR (%)	Investment cost, mn US $	Area, ha	Electricity saving, mn kWh
3	Berd	8	6	1,875	591	2,778	926	0.20	150	0.4	40.9%											0.2	150	0.4
4	Ijevan	15	15	5,330	679	3,907	527								0.28	67	0.0	234.3%	0.15	533	63.8%	0.4	533	0.0
5	Noyemberyan	12	12	7,779	2,990	5,744	2,336								0.84	947	0.3	90.5%	0.60	1,400	112.4%	1.4	1,400	0.3
VIII	**Vayots Dzor Marz**	**27**	**16**	**7,416**	**3,280**	**10,455**	**4,776**	**1.83**	**450**	**1.0**		**0.00**	**0**	**0.0%**	**0.00**	**0**	**0.0**	**0.0%**	**1.01**	**768**		**2.8**	**1,218**	**1.0**
1	Eghegnadzor	15	8	5,118	2,070	8,108	3,469	0.00							**0.00**	**0**	**0.0**		1.01	768	20.7%	1.0	768	0.0
2	Vayk	12	8	2,298	1,210	2,347	1,307	1.83	450	1.0	17.8%											1.8	450	1.0
IX	**Syunik Marz**	**59**	**50**	**13,206**	**7,602**	**17,744**	**10,468**	**10.87**	**6,705**	**7.7**		**0.00**	**0**	**0.0%**	**0.62**	**205**	**0.1**		**1.08**	**1,154**		**12.6**	**7,859**	**7.7**
1	Karahunj Jrambar	7	4	1,834	690	3,864	1,538	0.00														0.0	0	
2	Vorotan	8	8	4,180	690	5,110	892	0.00							0.62	205	0.1	173.9%	0.55	836	47.5%	1.2	836	0.1
3	Kapan	10	6	907	544	883	560	0.69	338	3.2	36.3%											0.7	338	3.2
4	Spandaryan	6	6	2,085	1,610	2,360	2,020	4.20	5,570		80.9%											4.2	5,570	
5	Tolors	7	6	1,604	1,604	1,024	1,024															0.0	0	
6	Dzorer	6	5	551	551	1,550	1,550	0.00														0.0	0	
7	Meghri	13	13	1,224	1,224	2,338	2,338	5.98	797	4.5	17.6%					-			0.53	318	41.0%	6.5	1,115	4.5
8	Brnakot	2	2	821	690	615	546	0.00														0.0	0	0.0
X	**Gegharkunik Marz**	**42**	**33**	**12,807**	**6,182**	**23,624**	**11,555**	**1.96**	**2,260**	**4.2**		**0.00**	**0**	**0.0%**	**0.70**	**3,305**	**1.0**		**0.81**	**1,241**		**3.5**	**3,501**	**5.2**
1	Gavar	12	8	1,812	1,481	4,082	3,530	0.00														0.0	0	0.0
2	Martuni	14	12	6,207	2,070	14,598	5,151	1.70	1,260	2.5	26.0%				0.70	3,305	1.0	169.6%	0.81	1,241	30.7%	3.2	2,501	3.5
3	Vardenis	16	13	4,788	2,631	4,944	2,874	0.26	1,000	1.7	88.3%											0.3	1,000	1.7
XI	**Yerevan WUA**	**5**	**5**	**2,600**	**730**	**4,300**	**1,207**	**0.00**														**0.0**	**0**	**0.0**
	TOTAL	**641**	**535**	**231,866**	**89,284**	**309,627**	**118,842**	**32.36**	**24,454**	**53.2**	**42.3%**	**8.37**	**2,000**	**23.3%**	**14.87**	**131,276**	**39.4**	**44.2%**	**24.50**	**28,116**	**43.0%**	**80.1**	**54,570**	**92.6**

ANNEX 3. SUMMARY OF IRRIGATION PROJECT COMPONENT A (Conversion from Pump to Gravity Irrigation)

	WATER USERS ASSOCIATIONS	COMMUNITIES	INVESTMENT COST, MN US $	IRRIGATED AREA, HA	ELECTRICITY SAVING, MN KWH	ERR (%)
1	Vardenis	Mets-Masrik, Pokr-Masrik, Norakert, Vardenis	0.26	1,000	1.7	88.3%
2	Shenik	Talvorik, Vanand, Hushakert, Artamet, Araks	0.97	2,150	4.46	85.2%
3	Spandaryan	Shaghap, Angeghakot, Shaki, Sisian, Noravan	4.2	4,330	-	80.9%
4	Aparan	Aparan, Quchak, Mulki, Hartavan, Aragats, Nigavan, Shenavan, Norashen, Yerndjatap, Aragyugh, Saralandj	1.49	1,950	2.4	60.0%
5	Vedi	Aygezard, Nor Ughi, Sisavan, Vedi	1.21	1,290	2.8	57.2%
6	Aygabats-Vorogum	Aygabats	0.14	224	0.3	49.2%
7	Aragats-Vorogum	Pokr-Mantash, Mets-Mantash, Spandaryan, Arevshat, Norashen, Geghadir, Meghrashen, Panik, Anushavan, Getap, Nahapetavan, Saralandj	1.3	2,040	0.8	44.6%
8	Berd	Verin-Karmiraghbyur, Nerkin-Karmiraghbyur	0.2	150	0.4	40.9%
9	Kasakh	Karpi, Ohanavan	0.28	189	0.8	39.6%
10	Ashtarak	Bagramyan, Norakert, Merdzavan	1.23	740	3.4	37.5%
11	Kapan	Norashenik, Tsav, Shikahogh	0.69	338	3.2	36.3%
12	Lori Canal	Kurtan, Vardablur, Hobardz, Gyulagarak, Amrakits	1.64	1,548	3	33.6%
13	Artashat	Narek, Qaghtsrashen	0.85	285	6.5	31.2%
14	Jrvezh-Dzoraghbyur	Garni, Geghard, Goght, Geghadir, Hatsavan, Voghjaberd	2.8	1130	5.8	27.7%
15	Adjapnyak-Vorogum (Kaps Canal)	Akhurik, Gharibjanyan, Getk, Yerazgavors, Bayandur, Isahakyan, Lusaghbyur, Gusangyugh, Aghin, Mayisyan, Ashotsk, Sepasar	4.75	3,108	7.8	26.8%
16	Martuni (Agridja Canal)	V.Getashen, N.Getashen, Madina, Tazagyugh, Dzoragyugh, Vardadzor, Tsakqar, Lichk, Yeranus	1.7	1260	2.5	26.0%
17	Kotayk	Ptghni	0.84	235	1.7	21.8%
18	Vajk (Khndzorut Canal)	Khndzorut	1.83	450	1	17.8%
19	Meghri (Lichk Canal)	Meghri, Karchevan, Agarak, Alvani, Shvanidzor, Nyuvadi	5.98	797	4.5	17.6%

ANNEX 4. SUMMARY OF IRRIGATION PROJECT COMPONENT B (New Reservoir Construction)

	WATER USERS ASSOCIATION	RESERVOIRS	COMMUNITIES	INVESTMENT COST, MN US $	IRRIGATED AREA, HA	ERR (%)
1	Aparan	Yerndjatap	Yerndjatap	0.7	180	42.0%
		Vardenut	Vardenut, Shenavan, Ara, Hartavan, Apna	0.51	300	
2	Aragats-Vorogum	Artik	Meghrashen, Vardakar, Artik	1.0	420	29.7%
		Bagravan	Bagravan	0.23	150	
3	Mush	Sasunashen	Verin and Nerkin Sasunashen, Davtashen, Bazmaberg	0.9	200	29.1%
		Irind	Irind	0.45	150	
4	Amberd	Byurakan	Byurakan, Orgov, Antarut, Tegher, Avan, Lernarot	4.57	600	13.0%

ANNEX 5. ECONOMIC ANALYSIS: RURAL ROAD NETWORK

Summary of Benefits and Costs:

Net benefit from improvement of rural road network estimated at US $ 8 million (Benefits: NPV US $ 65 million at 10% of opportunity cost of capital minus Costs: US $ 57 million (including project administration costs).

Cost Benefit analysis

The Rural Road component involves rehabilitation of about 1,100 kilometers (km) of selected rural roads accounting for more than 30 % of total rural road network. The without-project case in the economic evaluation represents the current situation. The with-project case is represented by improving the roads from current poor or very poor condition to good condition. The improved roads will reduce operating costs which will lead to a stimulus in economic growth resulting in increased traffic along the Project roads. The economic internal rate of return (EIRR) compared the annual streams of economic capital and operating costs and benefits. All costs, benefits, and revenues were expressed in 2004 constant prices. The analysis period is for the construction period followed by 20 years of operation.

Road Intensity: Current estimates and Forecasts

As there are no reliable information about actual intensity for most of rural roads the number of resident population of the connected communities has been taken to proxy traffic volumes for all rural roads. For all roads traffic volumes has been calculated based on a) 6% intensity to population ratio- high case scenario; b) 4% - base case scenario and c) 2% - worst case scenario. For a road which connects community with 1000 inhabitants and with typical traffic composition based scenario will result to 200 vehicles per day intensity. All road by road analysis conducted for base case scenario. Although, this approach in fact underestimate or overestimate actual intensity of roads and hence expected economic benefits from road improvements, however it has clear advantage over other methods, as it allows objectively rank roads for public interventions with no additional cost.

The transport of agricultural products in Armenia primarily takes place using road transport, and the sector is responsible for a considerable proportion of all rural road freight. Therefore, forecasts of freight traffic were based on forecasts of agriculture production growth and increased marketable surplus. To forecast passenger traffic growth rates the income elasticity of transport demand and per capita income growth have been estimated for the last five years. Taking into account the average traffic composition for the rural roads the overall intensity growth rate is estimated at 6% for the first 8 years and 4% for the period beyond. As currently there are potential users who deferred from using the road due to poor conditions, it was also assumed one time traffic increase of 10% due to improved road condition in first year after subproject completion. For all roads benefits from project generated traffic assumed to be 50% of benefits from current traffic.

Costs

The Project's financial costs for investment and maintenance were derived from the recent similar projects and range from 2.5 USD per m2 to 10.65 USD per m2 for capital cost and 400 to 1200 USD per km for maintenance. To derive to economic costs an unified

conversion factor 0.85 applied to financial costs. The Project roads are expected to have an average economic life of 20 years assuming capital repair will be undertaken each 6-8 year at estimated 20-30% of initial investment depending of type of improvements.

Benefits

The major economic benefits of the Project were quantified in terms of (i) vehicle operating cost savings arising from a reduction in the operating cost of vehicles due to an improvement in the road surface condition, (ii) time savings resulting from saving in time for trips along the Project roads, and (iii) savings in the marketable surplus of agricultural products through a reduction in the spoilage of goods traveling along the Project roads.

Typical road user savings for various vehicle types, based on opening year surface roughness levels (IRI), are shown in table below:

Vehicle operating cost with and without improvements (US$ per km)

VEHICLE TYPE	WITH PROJECT	WITHOUT PROJECT
Car	0.0872	0.144
Pickup	0.1114	0.173
Bus	0.2688	0.313
Medium Truck	0.1858	0.272
Heavy Truck	0.3556	0.537
Articulated truck	0.5318	0.801

Passenger time savings resulting from the increased speed due to improved road condition have been calculated assuming an increase of average speed from current 30 km/hour to 60 km/hour and time value at 150 AMD per hour at 2004 prices.

Benefits also arise due to an improvement in the transport of marketable surplus of agricultural products. Data was obtained on food production in the subproject road influence area for both food crops and commercial crops. Estimates were made of per capita food consumption. After deducting average consumption per family the marketable surplus was obtained. The increase in the value of the marketable surplus attributable to each subproject road was calculated by using conservative assumptions on the spoilage of crops in the "without" project and the "with" project cases. The spoilage on food grains in the "without" project case was estimated at 5% whilst in the "with" project case the spoilage was reduced to 3% of the marketable surplus. For commercial crops the spoilage in the "without" project case was estimated at 20% whereas in the "with" project case the spoilage was reduced to only 5% of the marketable surplus. The savings for commercial crops is much higher due to the severity of damage that can occur to commercial crops compared to food grain crops.

The benefits to road users were estimated from the differences between the costs in the "without project" case and the "with project" case. The Roads Economic Decision Model (RED) for the economic evaluation of low volume roads was used to estimate the benefits over time. The model predicts pavement deterioration and estimates yearly vehicle operating costs (VOCs) over the life of the investment for various strategies of improvement. The model then compares life cycle costs for the "with" project situation with the costs for the "without" project situation and computes the net present value (NPV) and estimates the economic internal rate of return (EIRR).

Economic Internal Rate of Return

EIRRs were calculated for the individual roads and then for those with positive NPV as a whole. The EIRR for each of the roads by district and marz are shown in ANNEX 6.

Sensitivity Analysis

The sensitivity of the total EIRR was analyzed with respect to changes in the benefit and cost streams. The sensitivity tests examined were, (i) a construction cost increased by 20 percent; (ii) benefits reduced by 20 percent; (iii) a reduction in traffic growth rates by 50%.

EIRR for the base case and the sensitivity tests. The EIRR for the priority subprojects as a whole is 25%. The economic viability of the overall component remains above the opportunity cost of capital of 10% under all of the sensitivity tests.

ANNEX 6. RURAL ROAD NETWORK REHABILITATION COMPONENT (Project Priority List by Marz and District)

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Total Marz	**Aragatsotn**			**95**	**32**	**35,745**	**5,398,000**	**70,900**		**3,288,992**			
Aragatsotn	Aparan	Dzoraglukh-Aparan	C	11	5	1,833	434,500	6,600	12%	40,195	Dzoraglukh-Ttudjur (2 km, C)-Vardenis (4 km, C)-Mulki (4 km, C)-Aparan (1 km, C)	308	(13; 65; 2050)
Aragatsotn	Aparan	Vardenut-M3	C	3	2	2,453	118,500	1,800	15%	35,777	Vardenut-Shenavan (2 km, C)-M3 (1 km, C)	343	(20; 37; 1900)
Sub Total for District				**14**	**7**	**4,286**	**553,000**	**8,400**		**75,972**			
Aragatsotn	Aragats	Hnaberd-Amre taza	C	3	3	2,777	45,000	1,800	50%	97,804	Hnaberd-Geghadzor (2 km, C)-Amre taza (1 km, C)	287	(12; 85; 2115)
Aragatsotn	Aragats	Norashen-Geghadir	C	2	1	965	30,000	1,200	30%	34,681	Norashen-Geghadir (2 km, C); Amre taza; Sangyar; Alagyaz	265	(15; 95; 2000)
Aragatsotn	Aragats	Tsaghkahovit-Sangyar	D	3	1	1,562	30,000	1,200	71%	89,485		301	(5; 80; 2140)
Sub Total for District				**8**	**5**	**5,304**	**105,000**	**4,200**		**221,970**			
Aragatsotn	Ashtarak	Antarut-M1	C	8	3	5,721	531,800	8,000	22%	386,906	Antarut-Byurakan (1 km, B)-Agarak (6 km, C)-M1 (1km, C)	348	(15; 40; 1705)
Aragatsotn	Ashtarak	Shamiram-M1	C	5	1	609	47,400	600	19%	24,895		336	(24; 45; 1100)
Aragatsotn	Ashtarak	Verin Sasunik-M1	C	10	2	2,022	444,600	5,700	20%	250,820	Verin Sasunik-Sasunik (9 km, C)-M1 (0,5 km, B)	291	(40; 65; 1700)
Sub Total for District				**23**	**6**	**8,352**	**1,023,800**	**14,300**		**662,621**			
Aragatsotn	Talin	Baysz-M1	C	6	3	2,409	233,500	3,600	24%	197,560	Baysz-Kakavadzor(1 km, C)-Nerqin Bazmaberd (4 km, C)-M1 (1 km, B)	305	(25; 60; 1800)
Aragatsotn	Talin	Garnahovit-M1	C	9	4	3,427	442,400	5,400	34%	624,315	Garnahovit-Zovasar (2 km, C)-Dzoragyugh (4 km, C)-Mastara (2 km, C)-M1 (1 km , C)	278	(20; 85; 2154)

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Aragatsotn	Talin	Lernagog-Qarakert	C	9	3	3,431	670,950	9,000	11%	53,552	Lernagog-Dalarik (3 km, C)-Qarakert (6 km, C)	311	(16; 65; 1020)
Aragatsotn	Talin	Tlik-M9	C-B	26	4	8,536	2,369,350	26,000	20%	1,453,003	Tlik-Getap (4 km, C)-Aragats (7 km, C)-Arteni (8 km, B)-M9 (7 km, B)	219	(45; 105; 1300)
Sub Total for District				**50**	**14**	**17,803**	**3,716,200**	**44,000**		**2,328,430**			
Total Marz	**Ararat**			**16**	**6**	**12,094**	**695,800**	**10,200**		**463,367**			
Ararat	Ararat	Sisavan-Vanashen	C	4	1	1,806	48,000	600	33%	63,150		377	(7; 42; 863)
Ararat	Ararat	Urcadzor-M2	C-B	12	5	10,288	647,800	9,600	21%	400,217	Urcadzor-Dashtaqar (6 km, C)-Vedi (1 km, B)-Vanashen (2 km, B)-Vosketap (2 km, B)-M2 (1 km, B)	337	(10; 58; 1050)
Sub Total for District				**16**	**6**	**12,094**	**695,800**	**10,200**		**463,367**			
Total Marz	**Armavir**			**34**	**18**	**37,726**	**1,795,800**	**16,800**		**2,261,216**			
Armavir	Armavir	Getashen-M5	C	4	3	5,187	252,800	2,400	27%	248,720	Getashen-Shenavan (1 km, C)-Nor Kesaria (1 km, C)-M5 (2 km, C)	329	(17; 60; 883)
Armavir	Armavir	Khandjyan-Armavir	C	5	4	4,939	285,000	3,000	18%	133,020	Khandjyan-Lukashin (2 km, C)-Noravan (2 km, C)-Armavir (1 km, B)	362	(10; 47; 870)
Armavir	Armavir	Lenughi-M5	C	4	1	1,510	79,000	600	18%	34,501		344	(8; 58; 890)
Armavir	Armavir	Nor Artages-Hoktember	C	4	4	5,208	214,600	2,400	24%	175,579	Nor Artages-Jrashen (2 km, C)-Bambakashat (1 km, C)-Hoktember (1 km, C)	354	(11; 51; 864)
Armavir	Armavir	Pshatavan-M5	C	12	4	10,136	853,200	7,200	42%	1,517,796	Pshatavan-Janfida (3 km, C)-Nalbandyan (3 km, C)-Amasia (4 km, C)-M5 (2 km, C)	360	(14; 45; 858)
Sub Total for District				**29**	**16**	**26,980**	**1,684,600**	**15,600**		**2,109,616**			

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Armavir	Echmiadzin	Griboyedov-M3	C	3	1	1,893	48,000	600	16%	17,080		408	(10; 25; 840)
Armavir	Echmiadzin	Metsamor-Gay	C	2	1	8,853	63,200	600	49%	134,520		422	(10; 20; 834)
Sub Total for District				**5**	**2**	**10,746**	**111,200**	**1,200**		**151,600**			
Total Marz	**Gegharkunik**			**117**	**36**	**99,894**	**5,955,000**	**76,900**		**12,297,501**			
Gegharkunik	Chambarak	Antaramech-M14	C	37	9	10,762	2,571,200	35,800	41%	4,553,942	Antaramech-Dzoravanq (3 km, C)-Dprabak (2 km, C)-Aygut (3 km, C)-Martuni (9 km, C)-Getik (1 km, C)-Ttujur (3 km, C)-Chambarak (4 km, C)-Aghberk (10 km, C)-M14 (2 km, B)	113	(33; 155; 1720)
Gegharkunik	Chambarak	Artanish-M14	C	2	1	720	47,400	600	20%	26,646		158	(30; 140; 1984)
Gegharkunik	Chambarak	Vahan-Chambarak	C	3	1	1,161	94,800	1,200	12%	13,197		263	(5; 110; 1900)
Sub Total for District				**42**	**11**	**12,643**	**2,713,400**	**37,600**		**4,593,785**			
Gegharkunik	Gavar	Gegharkunik-M10	C-B	10	5	38,431	501,000	6,800	41%	874,569	Gegharkunik-Lanjaghbyur (1 km, C)-Sarukhan (1 km, C)-Karmirgyugh (4 km, B)-Gavar (2 km, B)-M10 (2 km, B)	232	(12; 120; 2090)
Gegharkunik	Gavar	Noratus-M10	C	3	1	5,465	63,200	600	65%	177,959		274	(7; 100; 1940)
Sub Total for District				**13**	**6**	**43,896**	**564,200**	**7,400**		**1,052,527**			
Gegharkunik	Martuni	Dzoragyugh-M10	C	3	1	3,596	142,200	1,800	47%	292,672		232	(12; 120; 2050)
Gegharkunik	Martuni	Sarnaghbyur-M10	C	25	5	12,695	1,185,000	15,000	102%	4,686,476	Sarnaghbyur-Karachi (6 km, C)-Madina (10 km, C)-Verin Getashen (7 km, C)-Nerkin Getashen (1 km, C)-M10 (1 km, C)	222	(9; 127; 1975)
Gegharkunik	Martuni	Zolakar-M11	C	3	1	5,720	36,000	600	81%	120,932		221	(7; 130; 2005)

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Sub Total for District				**31**	**7**	**22,011**	**1,363,200**	**17,400**		**5,100,080**			
Gegharkunik	Sevan	Geghamavan-M4	C	3	2	2,923	142,200	1,800	20%	82,344	Geghamavan-Gagarin (2 km, C)-M4 (1 km, C)	325	(7; 60; 1850)
Gegharkunik	Sevan	Lchashen-M4	C	1	1	4,212	24,000	300	36%	36,058		315	(5; 65; 1930)
Gegharkunik	Sevan	Zovaber-M4	C	7	2	3,654	468,600	4,600	17%	184,712	Zovaber-Ddmashen(1 km, C)-M4 (6 km, C)	289	(18; 78; 1760)
Sub Total for District				**11**	**5**	**10,789**	**634,800**	**6,700**		**303,114**			
Gegharkunik	Vardenis	Akhpradzor-M11	C	10	4	3,938	474,000	6,000	46%	946,736	Akhpradzor-Makenis (3 km, C)-Lchavan (2 km, C)-Tsovak (4 km, C)-M11 (1 km, C)	87	(25; 175; 2280)
Gegharkunik	Vardenis	Akunk-Vardenis	C	2	1	3,469	94,800	600	60%	248,198		145	(3; 170; 2005)
Gegharkunik	Vardenis	Karchaghbyur-M11	C	1	1	2,291	63,200	600	24%	52,279		143	(15; 160; 1965)
Gegharkunik	Vardenis	Norakert-Pokr Masrik	C	7	1	857	47,400	600	10%	781		111	(13; 174; 1970)
Sub Total for District				**20**	**7**	**10,555**	**679,400**	**7,800**		**1,247,994**			
Total Marz Kotayk				**14**	**2**	**1,542**	**109,300**	**1,600**		**88,203**			
Kotayk	Hrazdan	Fantan-M4	C	7	1	1,026	54,000	600	38%	85,453		364	(17; 30; 1800)
Sub Total for District				**7**	**1**	**1,026**	**54,000**	**600**		**85,453**			
Kotayk	Nairi	Teghenik-Karashamb	C	7	1	516	55,300	1,000	11%	2,751		371	(15; 37; 1565)
Sub Total for District				**7**	**1**	**516**	**55,300**	**1,000**		**2,751**			
Total Marz Lori				**182**	**54**	**50,005**	**5,710,350**	**114,700**		**6,577,839**			

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Lori	Gugark	Antaramut-M6	C	6	2	1,578	90,000	3,600	21%	57,095	Antaramut-Vahagni (5 km, C)-M6 (1 km, C)	157	(25; 150; 1350)
Lori	Gugark	Debet-M6	C	5	1	899	168,000	2,400	14%	39,554		175	(23; 140; 1050)
Lori	Gugark	Gugark-M6	C	1	1	4,739	15,000	600	39%	24,755		254	(0; 125; 1350)
Lori	Gugark	Gyullidara-M3	C	16	6	4,227	199,500	9,600	162%	1,013,448	Gyullidara-Kilisa (2 km, C)-Halavar (2 km, C)-Haydarli (2 km, C)-Lernapat (4 km, C)-Darpas (5 km, C)-M3 (1 km, B)	206	(22; 127; 1690)
Lori	Gugark	Yeghegnut-M6	C	2	1	1,162	17,500	600	31%	21,093		191	(19; 137; 1125)
Sub Total for District				**30**	**11**	**12,605**	**490,000**	**16,800**		**1,155,945**			
Lori	Spitak	Khnkoyan-M7	C	7	1	408	36,000	1,800	58%	89,081		211	(24; 114; 1863)
Lori	Spitak	Tsaghkaber-M7	C-B	7	2	3,164	324,000	4,200	46%	648,698	Tsaghkaber-Mets Parni (4 km, C)-M7 (3 km, B)	225	(20; 112; 1775)
Sub Total for District				**14**	**3**	**3,572**	**360,000**	**6,000**		**737,778**			
Lori	Stepanavan	Hobardz-H24	C	1	1	777	15,000	600	30%	17,432		184	(9; 150; 1350)
Lori	Stepanavan	Katnaghbyur-Stepanavan	C	13	4	1,709	616,200	7,800	23%	480,220	Katnaghbyur-Urasar (6 km, C)-Armanis (3 km, C)-Stepanavan (4 km, C)	149	(13; 163; 1640)
Lori	Stepanavan	Koghes-M3	C	12	4	2,370	894,600	12,000	17%	367,892	Koghes-Yaghdan (3 km, C)-Agarak (3 km, C)-M3	176	(12; 150; 1280)
Lori	Stepanavan	Kurtan-Gyulagarak	C	5	3	2,220	372,750	5,000	13%	70,226	Kurtan-Vardablur (3 km, C)-Gyulagarak (2 km, C)	209	(12; 135; 1240)
Lori	Stepanavan	Sverdlov-M3	C	8	2	2,079	511,200	8,000	19%	271,005	Sverdlov-Urut (2 km, C)-M3 (6 km, C)	163	(14; 157; 1480)
Sub Total for District				**39**	**14**	**9,155**	**2,409,750**	**33,400**		**1,206,775**			
Lori	Tashir	Lernahovit-Tashir	C	14	1	1,413	237,000	1,800	18%	104,331		117	(11; 179; 1654)
Lori	Tashir	Mikhaylovka-M3	C	5	1	737	15,000	600	27%	14,608		147	(4; 172; 1520)

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Lori	Tashir	Paghaghbyur-M3	C	14	3	5,191	821,600	8,400	51%	1,824,877	Paghaghbyur-Dzyunashogh (6 km, C)-Metsavan (3 km, C)-M3 (5 km, C)	70	(25; 193; 1750)
Lori	Tashir	Sarchapet-M3	C	5	2	3,352	237,000	3,000	13%	37,841	Sarchapet-Norashe (3 km, C)-M3 (2 km, C)	86	(15; 183; 1705)
Sub Total for District				**38**	**7**	**10,693**	**1,310,600**	**13,800**		**1,981,657**			
Lori	Tumanyan	Ahnidzor-Tumanyan	C	21	3	983	315,000	21,000	26%	298,582	Ahnidzor-Marts (14 km, C)-Tumanyan (7 km, C)	81	(41; 170; 1525)
Lori	Tumanyan	Atan-H22	C	7	2	723	105,000	4,200	56%	252,285	Atan-Shamut (4 km, C)-H22 (3 km, C)	67	(45; 180; 1720)
Lori	Tumanyan	Chkalov-M6	C	6	2	2,715	105,000	3,600	39%	171,731	Chkalov-Dsegh (5 km, C)-M6 (1 km, C)	75	(35; 185; 1350)
Lori	Tumanyan	Chochkan-Pokr Ayrum	C	4	3	2,347	60,000	2,400	39%	97,289	Chochkan-Mets Ayrum (1 km, C)-Pokr Ayrum (3 km, C)	110	(33; 152; 1833)
Lori	Tumanyan	Lorut-H22	C	1	1	1,109	30,000	1,200	34%	41,627		80	(50; 164; 1535)
Lori	Tumanyan	Teghut-M6	C	4	2	3,614	60,000	2,100	63%	162,152	Teghut-Shnogh (3 km, C)-M6 (0,5 km, C)	64	(33; 203; 690)
Lori	Tumanyan	Tsaghkashat-M6	C	9	2	1,000	270,000	5,400	25%	241,231	Tsaghkashat -Haghpat (7 km, C)-M6 (2 km, C)	85	(17; 190; 1005)
Lori	Tumanyan	Tsater-M6	C	2	1	482	15,000	600	71%	44,579		84	(29; 179; 1260)
Lori	Tumanyan	Verin Akhtala-Akhtala	C	7	3	1,007	180,000	4,200	28%	186,207	Verin Akhtala-Pokr Ayrum (5 km, C)-Akhtala (2 km, C)	102	(7; 190; 1030)
Sub Total for District				**61**	**19**	**13,980**	**1,140,000**	**44,700**		**1,495,683**			
Total Marz Shirak				**225**	**67**	**75,358**	**11,551,500**	**161,600**		**10,100,834**			
Shirak	Akhuryan	Arapi-M7	C	2	1	1,751	94,800	1,200	16%	35,024		235	(7; 129; 1457)
Shirak	Akhuryan	Aygabac-Gyumri	C	10	3	2,230	671,500	6,000	16%	248,960	Aygabac-Arevik (5 km, C)-Gyumri (5 km, C)	217	(15; 128; 1560)

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Shirak	Akhuryan	Bayandur-M1	C	10	4	6,549	450,300	5,700	35%	656,673	Bayandur-Getk (4 km, C)-Gharibjanyan (2 km, C)-Azatan (3 km, C)-M1 (0,5 km, C)	200	(21; 130; 1480)
Shirak	Akhuryan	Haykavan-M7	C	6	1	1,193	240,000	3,600	14%	50,721		204	(14; 135; 1460)
Shirak	Akhuryan	Jrarat-Gyumri	C	18	5	11,125	920,200	10,800	33%	1,213,230	Jrarat-Musayelyan (4 km, C)-Karnut (6 km, C)-Akhuryan (5 km, C)-Gyumri (3 km, C)	166	(17; 140; 1775)
Shirak	Akhuryan	Kamo-M7	C	3	1	1,350	142,200	1,800	10%	2,454		243	(12; 120; 1650)
Shirak	Akhuryan	Karmrakar-Maisyan	C	5	3	1,099	184,800	3,000	14%	44,085	Karmrakar-Hatsik (3 km, C)-Maisyan (2 km, C)	199	(17; 134; 1700)
Shirak	Akhuryan	Marmashen-Hanr. chan.	C	1	1	1,656	47,400	600	18%	21,952		207	(14; 134; 1610)
Shirak	Akhuryan	Voskehask-M7	C	1	1	1,816	30,000	600	36%	45,051		215	(11; 132; 1480)
Sub Total for District				**56**	**20**	**28,769**	**2,781,200**	**33,300**		**2,318,150**			
Shirak	Amasia	Aregnadem -Gyumri	C	22	4	1,621	660,000	13,200	34%	903,027	Aregnadem-Gyullibulagh (7 km, C)-Voghchi (5 km, C)-Gyumri (10 km, C)	179	(6; 146; 1860)
Shirak	Amasia	Lorasar-Tsaghkut	C	3	1	400	90,000	1,800	10%	127		39	(28; 271; 2030)
Shirak	Amasia	Voghchi-M1	C	29	8	1,792	870,000	17,400	42%	1,540,962	Voghchi-Shaghik (4 km, C)-Garnarich (2 km, C)-Tsaghkut (3 km, C)-Zorakert (3 km, C)-Ardenis (6 km, C)-Aghvorik (4 km, C)-Tavshut (6 km, C)-M1 (1 km, C)	197	(21; 131; 1622)
Sub Total for District				**54**	**13**	**3,813**	**1,620,000**	**32,400**		**2,444,117**			
Shirak	Ani	Anipemza-Maralik	C	33	5	2,622	2,811,600	33,000	16%	995,570	Anipemza-Bagravan (7 km, C)-Sarakap (13 km, C)-Karaberd (8 km, C)-Maralik (5 km, C)	240	(37; 98; 1380)

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Shirak	Ani	Isahakyan-M1	C	11	4	2,210	871,200	9,800	11%	41,335	Isahakyan-Lusaghbyur (4 km, C)-Noraber (4 km, C)-Gusanagyugh (2 km, C)-M1 (1 km, C)	251	(20; 110; 1440)
Sub Total for District				**44**	**9**	**4,832**	**3,682,800**	**42,800**		**1,036,905**			
Shirak	Artik	Anushavan-Panik	C	1	1	1,543	35,000	600	17%	13,747		266	(6; 110; 1700)
Shirak	Artik	Geghanist-Horom	C	10	5	5,767	439,200	6,000	33%	579,446	Geghanist-Spandaryan (4 km, C)-Panik (3 km, C)-Nor kyanq (2 km, C)-Horom (1 km, C)	223	(12; 120; 1845)
Shirak	Artik	Lemakert-M1	C	11	2	3,769	871,200	9,800	24%	726,538	Lemakert-Pemzashen (3 km, C)-M1 (8 km, C)	246	(13; 110; 1990)
Shirak	Artik	Mets Mantash-M1	C	18	5	22,751	1,554,900	17,500	32%	1,979,154	Mets Mantash-Pokt Mantash (0,5 km, C)-Saralanj (3 km, C)-Artik (4 km, C)-Horom (7 km, C)-M1 (3 km, C)	276	(12; 90; 1995)
Shirak	Artik	Saratak-M1	C	1	2	1,767	63,200	600	10%	110	Saratak-Lusakert (0,5 km, C)-M1 (0,5 km, C)	248	(11; 120; 1550)
Sub Total for District				**41**	**15**	**35,597**	**2,963,500**	**34,500**		**3,298,995**			
Shirak	Ashotsk	Dzorashen-Vardaghbyur	C-B	24	6	826	360,000	14,400	60%	931,024	Dzorashen-Kakavasar (7 km, B)-Pokr Sariar (2 km, B)-Bashgyugh (4 km, C)-Salut (6 km, B)-Vardaghbyur (5 km, B)	78	(38; 170; 1940)
Shirak	Ashotsk	Hartashen-M1	C	4	2	594	72,000	2,400	15%	19,691	Hartashen-Zuygaghbyur (2 km, C)-M1 (2 km, C)	183	(9; 142; 2015)
Shirak	Ashotsk	Pokr Sepasar-M1	C-B	3	2	927	72,000	1,800	22%	51,953	Pokr Sepasar-Mets Sepasar (1 km, B)-M1 (2 km, C)	160	(8; 155; 1975)
Sub Total for District				**31**	**10**	**2,347**	**504,000**	**18,600**		**1,002,668**			

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Total Marz Syunik				**289**	**64**	**34,484**	**14,855,200**	**220,200**		**15,086,021**			
Syunik	Goris	Brun-Verishen	C	2	1	1,035	94,800	1,200	17%	39,786		52	(4; 259; 1700)
Syunik	Goris	Khndzoresk-M12	C	3	1	1,954	142,200	1,800	50%	307,092		45	(13; 268; 1580)
Syunik	Goris	Khot-M2	C	9	1	863	426,600	5,400	15%	114,321		46	(12; 267; 1350)
Syunik	Goris	Khoznavar-M2	C	17	2	2,592	805,800	10,200	25%	728,308	Khoznavar-Verishen (16 km, C)-M2 (1 km, C)	27	(45; 300; 1592)
Syunik	Goris	Komidzor-Tegh	C	4	1	1,047	189,600	2,400	34%	267,148		9	(25; 380; 1125)
Syunik	Goris	Svarants-M2	C	29	4	4,106	1,853,100	29,000	32%	2,319,663	Svarants-Tatev (1 km, C)-Halidzor (19 km, C)-Shinuhayr (3 km, C)-M2 (6 km, C)	30	(40; 295; 1700)
Syunik	Goris	Vaghatur-M12	C	16	2	1,447	758,400	9,600	44%	1,425,680	Vaghatur-Khnatsakh (3 km, C)-M12 (13 km, C)	34	(37; 292; 1550)
Sub Total for District				**80**	**12**	**13,044**	**4,270,500**	**59,600**		**5,201,997**			
Syunik	Kapan	Aghvani-M2	C	27	5	854	1,842,450	27,000	15%	542,401	Aghvani-Tandzaver (2 km, C)-Verin Khotanan (8 km, C)-Shrvenants (4 km, C)-Norashenik (2 km, C)-M2 (11 km, C)	10	(37; 358; 1720)
Syunik	Kapan	David Bek-M2	C	4	1	811	158,000	2,400	23%	124,319		33	(25; 304; 1100)
Syunik	Kapan	Ditsmayri -Syunik	C	3	3	1,592	118,500	1,800	57%	295,154	Ditsmayri-Siznak (2 km, C)-Syunik (1 km, C)	36	(8; 317; 840)
Syunik	Kapan	Qirs-M2	C	17	5	699	671,500	10,200	23%	528,088	Qirs-Kyurut (2 km, C)-Geghi (7 km, C)-Geghavank (2 km, C)-Kavchut (5 km, C)-M2 (1 km, C)	13	(30; 352; 1600)
Syunik	Kapan	Shishkert-M2	C	39	5	1,032	1,970,250	39,000	33%	2,595,803	Shishkert-Tsav (10 km, C)-Srashen (7 km, C)-Shikahogh (4 km, C)-Chakaten (10 km, C)-M2 (8 km, C)	8	(47; 364; 1100)
Syunik	Kapan	Uzhanis-M2	C	11	4	658	434,500	6,600	21%	269,121	Uzhanis-Yeghvard (2 km, C)-Agarak (3 km, C)-Khdrants (3 km, C)-M2 (3 km, C)	16	(26; 349; 1120)

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Syunik	Kapan	Verin Gedaklu-M2	C	6	2	910	237,000	3,600	26%	223,918	Verin Gedaklu-Nerkin Gedaklu (5 km, C)-M2 (1 km, C)	35	(14; 312; 1120)
Sub Total for District				**107**	**25**	**6,556**	**5,432,200**	**90,600**		**4,578,804**			
Syunik	Meghri	Karchevan-Agarak	C	3	1	340	47,400	600	35%	69,094		3	(17; 416; 920)
Sub Total for District				**3**	**1**	**340**	**47,400**	**600**		**69,094**			
Syunik	Sisian	Arevis-Sisian	C	19	5	1,155	900,600	11,400	24%	713,766	Arevis-Tasik (8 km, C)-Hatsavan (2 km, C)-Ashotavan (3 km, C)-Sisian (6 km, C)	47	(21; 246; 1950)
Syunik	Sisian	Mutsk-M13	C	6	2	1,394	284,400	3,600	33%	376,593	Mutsk-Shaghat (5 km, C)-M13 (1 km, C)	43	(26; 251; 1870)
Syunik	Sisian	Salvard-Sisian	C	12	3	2,332	568,800	7,200	64%	1,561,607	Salvard-Brnakot (6 km, C)-Sisian (6 km, C)	48	(19; 244; 1940)
Syunik	Sisian	Shenatagh-M2	C	27	7	2,678	1,279,800	16,200	27%	1,246,140	Shenatagh-Lor (3 km, C)-Getatagh (1 km, C)-Darbas (2 km, C)-Ltsen (6 km, C)-Vorotan (8 km, C)-Vaghatin (1 km, C)-M2 (6 km, C)	41	(35; 260; 1760)
Syunik	Sisian	Spandaryan-M2	C	5	2	985	237,000	3,000	18%	110,294	Spandaryan-Sarnakunk (4 km, C)-M2 (1 km, C)	48	(19; 244; 2150)
Syunik	Sisian	Tsghuni-M2	C	30	7	6,000	1,834,500	28,000	21%	1,227,724	Tsghuni-Soflu (1 km, C)-Dastakert (4 km, C)-Torunik (5 km, C)-Tolors (10 km, C)-Sisian (4 km, C)-Shaki (5 km, C)-M2 (1 km, C	82	(25; 180; 2010)
Sub Total for District				**99**	**26**	**14,544**	**5,105,100**	**69,400**		**5,236,125**			
Total Marz Tavush				**86**	**17**	**31,408**	**3,469,300**	**66,000**		**5,722,995**			
Tavush	Idjevan	Achadjur-M4	C	1	1	3,901	94,800	1,200	28%	101,208		162	(20; 155; 760)

Marz	District	Project name	Current condition (a)	Distance (km)	Number of communities (b)	Number of inhabitants (person)	Project Cost /USD/	Maintenance need /USD/	EIRR	NPV	Communities connected	Rank	Distance from District center, Yerevan, altitude
Tavush	Idjevan	Lusahovit-M4	C-B	4	2	2,073	155,400	2,400	35%	227,317	Lusahovit-Khashtarak (3 km, B)-M4 (1 km, C)	182	(14; 149; 810)
Sub Total for District				**5**	**3**	**5,974**	**250,200**	**3,600**		**328,525**			
Tavush	Tavush	Chinari-Idjevan	D-C	59	7	18,484	2,946,600	51,000	38%	4,762,635	Chinari-Aygedzor (3 km, D)-Artsvaberd (8 km, D)-Verin Karmir aghbyur (4 km, C)-Berd (5 km, C)-Navur (7 km, C)-Idjevan (32 km, C)	51	(33; 237; 740)
Tavush	Tavush	Chinchin-Navur	C	8	1	702	75,000	3,000	36%	111,926		66	(15; 219; 980)
Tavush	Tavush	Movsesgyugh-Verin Karmir aghbyur	D-C	5	3	3,695	62,500	3,000	117%	265,312	Movsesgyugh-Norashen (4 km, D)-Verin Karmir aghbyur (1 km, C)	60	(19; 222; 860)
Tavush	Tavush	Nerkin Karmir aghbyur -Berd	C	9	3	2,553	135,000	5,400	44%	254,596	Nerkin Karmir aghbyur-Tovuz (6 km, C)-Berd (3 km, C)	79	(10; 204; 840)
Sub Total for District				**81**	**14**	**25,434**	**3,219,100**	**62,400**		**5,394,470**			
Total Marz Vayots Dsor				**45**	**8**	**5,268**	**1,963,850**	**37,600**		**1,139,120**			
Vayots Dzor	Vajk	Bardzruni-Zaritap	C-B	14	4	1,292	870,450	14,000	11%	63,619	Bardzruni-Sers (5 km, C)-Martiros (5 km, B)-Zaritap (4 km, B)	116	(28; 167; 1700)
Vayots Dzor	Vajk	Khndzorut-M2	C-B	26	3	2,037	757,400	18,800	34%	1,065,372	Khndzorut-Nor Aznaberd (3 km, C)-Zaritap (15 km, C)-M2 (8 km, B)	88	(30; 169; 1760)
Sub Total for District				**40**	**7**	**3,329**	**1,627,850**	**32,800**		**1,128,991**			
Vayots Dzor	Yeghegnadzor	Aghavnadzor-M2	C	5	1	1,939	336,000	4,800	11%	10,129		247	(16; 119; 1520)
Sub Total for District				**5**	**1**	**1,939**	**336,000**	**4,800**		**10,129**			
Total Rural Roads				**1,104**	**304**	**383,524**	**51,504,100**	**776,500**		**57,026,087**			

ANNEX 7. DESCRIPTION OF THE CONSULTATIVE PROCESS (Meetings in marzes)

Consultations in marzes: Discussions and round-tables on Armenia's Millennium Challenge Account Program were held in all marzes of Armenia. These events revealed that there is a significant shortage of information, particularly in rural areas, and many are left outside the discussional and decision-making processes, because of being unaware of the possibility, as well as inadequate information, knowledge and communication possibilities.

Consultative meetings in marzes were organized by both regional authorities and PRSP structures, and participants in the events organized by the latter were mainly representatives from marz NGOs.

Consultations in Armavir town (July 10 and 20, Armavir marz)

Armavir marz is the smallest marz by territory and is located in Ararat valley in the west of the country. The marz borders with Turkey, occupies 4.2 percent of the country's territory, and more than 60 percent of its residents live in rural areas. The administrative territory of the marz comprises of 97 communities, 3 of which are urban (Armavir, Vagharshapat, Metzamor), and 94 are rural. The geographical location and natural-climatic conditions of the marz are favorable for the development of crops, as well as livestock, production.

On July 20, 2004, consultations on Armenia's Millennium Challenge Account Program were took place at the session of marz council invited by Armavir Governor with the participation of heads of communities, representatives from marz's non-governmental and political organizations, political parties, civil society organizations, the press and other the mass media. The event was broadcast on the same day by the mass media for the entire population of the marz. After the meeting, issues discussed were presented in detail at the press conference convened by Armavir Governor.

The secretariat of the Board of Trustees organized a meeting at the municipal library of Armavir marz on June 10, 2004, where the main participants represented marz NGOs.

As a result of consultations, the following were proposed as investment directions for Armenia's Millennium Challenge Account Program in the marz: *improvement of drinking water supply system, rehabilitation of tertiary irrigation canals, drilling new deep wells, repair of water canals, construction of water pipelines, desalination of marz's lands, flood protection measures, repair of the closed drainage network, as well as reconstruction of marz and community roads.*

Consultations in Gavar town (June 29, Gegharkunik marz)

Gegharkunik marz is in the east of the country and encircles Lake Sevan. Borders Azerbaijan. 90 percent of marz's rural settlements are in high mountainous areas and 10 percent in upland areas. 5.2 percent of marz's population (12,400 people) are refugees. The marz has 5 urban and 87 rural communities, 20 of which are near the border, and residents live mainly in rural areas (63.2 percent of marz's population). The main employment of marz's population is in livestock production and farming. Residents grow mainly potato and cabbage, which are the most suitable crops for marz's natural-climatic conditions. Marz's poverty rate is 59.9 percent, which is nealry 1.4 times higher than the national average.

The secretariat of the Board of Trustees organized a meeting at the hall of Gegharkunik marz government on June 29, 2004, where the main participants were heads of businesses operating in the marz and representatives from marz NGOs. Gegharkunik Governor opened the meeting and presented the objectives of Armenia's Millennium Challenge Account Program, which initiated active discussions.

In order to acquaint marz's population with the objectives of the Millennium Challenge Account Program through marz the mass media, the main directions of programs planned and priorities which would contribute to economic development and progress in the marz were clarified in detail during meetings with communities' residents.

It was mentioned during the meeting that *the repair and expansion of the irrigation system in particular has a crucial significance for the marz, since around 70,000 ha of arable land is not irrigated due to inadequacies of the system and its ineffective operation. The marz still has unresolved problems relating to drinking water. Marz and intercommunity roads, in particular, still need to be improved. At the same time, the low level of access to markets, the underdeveloped agricultural financing and insurance system, outdated agricultural machinery or their total unavailability were mentioned among the problems faced by farms in need of urgent solutions.*

Consultations in Ijevan town (June 24 and 29, Tavush marz)

Tavush marz is situated in the north-east of the country. Borders Azerbaijan and Georgia. Tavush marz is rich in forests. The marz has 4 urban and 61 rural settlements, occupies 9 percent of Armenia's territory and 60 percent of its residents live in rural areas. Tavush marz's economy has agricultural orientation, in spite of its small area of available land and having one of the smallest total agricultural land areas allocated to farms during the privatization in the country. Fruits, tobacco and grain production are the main activities in the marz. Hog production if the prevalent sector of livestock production.

A discussion on Armenia's Millennium Challenge Account Program was organized at marz government headquarters on June 24, 2004 with the participation of representatives from community authorities, businesses, non-governmental and international organizations. Tavush marz Governor presented the objectives of the Millennium Challenge Account Program and the approaches of the Government of Armenia with regard to programmatic directions.

The secretariat of the Board of Trustees organized a meeting at the small and medium-sized business support center in Ijevan town on June 29, 2004, where the main participants were representatives from marz NGOs.

As a result of consultations, participants identified those problems of the marz, which can be included within the framework of Armenia's Millennium Challenge Account Program. Those problems are as follows: *repair of national and local roads in the marz, as well as improvement of routes in mountainous areas, construction of gravitational irrigation systems, repairs of intra-farm networks, construction of small water reservoirs in order to increase areas under irrigation, re-operation of existing factories for processing agricultural products and building new ones, repair of drinking water supply networks and exploitation of new water sources, repair of schools and cultural facilities and their*

furnishing, increase access to financial resources in order to develop small and medium sized businesses.

Consultations in Shirak marz (June 24 and July 1, Shirak marz)

Shirak marz is in the north-west of the country and borders Turkey and Georgia. It is the coldest region in Armenia, where winter temperatures reach -46°C. The main railroad and motorway connecting Armenia to Georgia cross marz's territory. This is where the railroad and road networks of Armenia and Turkey connect. Shirak marz has 3 towns and 128 rural communities; the marz occupies 9 percent of Armenia's territory and nearly 70 percent of its population live in urban communities, 60 percent of whom in Gyumri town. Until the 1988 Spitak earthquake, the marz by its level of development and economic potential was second only to Yerevan.

A meeting devoted to discussions on Armenia's Millennium Challenge Account Program with the participation of heads of communities and farmers of Artik and Ani regions of Shirak marz was held on June 24, 2004. Shirak marz government employees, heads of communities and farmers participated in the meeting.

During the meeting, the following were proposed as priority measures in the marz within the framework of Millennium Challenge Account Program: *resume and finish the construction of Kaps and Artik water reservoirs, improvement of inter-community and intra-community roads in the marz.*

The secretariat of the Board of Trustees organized a meeting Gyumri town of Shirak marz on July 1, 2004, where the main participants were representatives from marz NGOs. Participants mentioned the possible directions of investments as *restoration of the irrigation network, repair of marz and community roads, as well as expand possibilities for marketing of agricultural goods and restoration of the processing industry. The need for job creation and allocation of housing to those who became homeless as a result of 1988 earthquake and do not yet have their own dwelling were emphasized in particular. At the same time, considering the natural-climatic condition of the marz, the restoration of heating systems and expansion of the gas supply system were also mentioned.*

Consultations in Vanadzor town (July 1, Lori marz)

Lori marz is the third largest marz and occupies 12.7 percent of Armenia's territory. It is in the first place by population. It is situated in the north of the country and borders Georgia. Lori marz is rich in forests. The marz is situated in the 1988 earthquake zone. Lori marz has 8 towns and 122 rural settlements, and nearly 70 percent of the population is urban.

Two meetings in Vanadzor town on Armenia's Millennium Challenge Account Program were organized. Participants at the meeting held in Lori marz government were heads of marz communities, commercial and non-commercial enterprises, representatives from political parties, NGOs and the mass media. The second meeting was organized by the Board of Trustees at the Vanadzor office of Helsinki Civic Union NGO.

As a result of consultations, it was decided to underline the following directions as priorities for the marz within the framework of Armenia's Millennium Challenge Account Program: *improvement of the irrigation system, improvements of water supply and sewage system, environmental protection, biodiversity and protection of population's health, forest restoration, measures for combating desertification and landslides, reconstruction of*

landfills and overhauls of marz roads. Improvement of the business environment was also brought up, which, according to participants, will contribute to the development of small and medium size businesses.

Consultations in Yeghegnadzor town (July 23, Vayots Dzor marz)

Vayots Dzor marz is situated in the north of Zangezur. Borders Azebaijan (Nakhijevan Autonomous Republic). It has 3 towns and 52 rural settlements. Occupies 7.8 percent of Armenia's territory and 60 percent of its population live in rural communities. Vayots Dzor does not have a very powerful economy. Agriculture accounts for the major share of the total production. It is the only marz in Armenia, where mechanical irrigation is still prevalent, i.e. irrigation water is supplied with the help of pumping stations.

The Government of Armenia and the secretariat of the Board of Trustees organized and held discussions on the preparation of Armenia's Millennium Challenge Account Program in Yeghegnadzor town on June 28 and July 23, 2004.

Participants were heads of marz communities, commercial and non-commercial enterprises, as well as representatives of NGOs operating in the marz. Approaches of the Government of Armenia with regard to the possible directions of Armenia's Millennium Challenge Account Program were presented during the discussions.

As a result of discussions, participants, in general, endorsed the directions proposed by the Government of Armenia (restoration of local roads, improvement of irrigation systems), mentioning at the same time, however, that together with those directions they also attach importance to *job creation and reduction of unemployment as the main problems of the region, recommendations for the solution of which were torestore former capacities in the marz with regard to agricultural processing and light industries. From the viewpoint of improving the business environment in the marz it was recommended to improve the legal framework and reduce corruption. Importance was attached to investment programs for developing tourism infrastructures, as a promising direction for job creation in the marz.*

Participants also underlined the issues of organizing the marketing of agricultural goods and establishing a regional wholesale market, which would also possess full information on the volumes and producers of agricultural goods in the marz. According to participants, creation of such data base will facilitate farmers' efforts in marketing their goods.

Consultations in Goris town (July 16, Syunik marz)

Syunik marz is situated in the south of the country, borders Iran and Azerbaijan. It has 7 towns and 128 rural settlements. Occupies 15 percent of Armenia's territory and is the most urbanized marz after Yerevan, 71 percent of its residents are urban dwellers. By its economic capacities, Syunik marz lags far behind the majority of marzes. The marz is famous for its diversity of natural riches. Marz's industry is specialized in nonferrous metallurgy and energy production.

The Government of Armenia and the secretariat of the Board of Trustees organized and held discussions on the preparation of Armenia's Millennium Challenge Account Program in Goris town on June 16, 2004. Participants included representatives of marz NGOs, which were involved in various fields of activity in Goris town and the region, such as education, healthcare, culture, environment, etc.

As a factor constraining marz's development, participants mentioned the limited transportation links to areas outside the marz, such as the absence of railroads due to the blockade imposed by the neighboring countries, which, according to participants, does not allow the marz to use its natural resources to the full and develop the corresponding processing and mining industries. *The urgency of problems related to drinking and irrigation water networks and repair of local and community roads was reiterated. The problem of drinking water was particularly underlined for Goris town. The need to restore gas supply was also mentioned. Availability of quality and affordable seeds was mentioned as the most important precondition for increasing the productivity of crops production and enhancing population's living standards. Enhancing the accessibility and quality of education and healthcare was mentioned as a particularly important direction, including improvement of material-technical provisions and restoration of heating in schools.*

Consultations in Artashat town (July 27, Ararat marz)

Ararat marz is situated in the south-east of the country and occupies a large part of the Ararat valley. Borders Turkey and Azerbaijan (Nakhijevan Autonomous Republic). It has 4 towns and 94 rural settlements. Occupies 7 percent of Armenia's territory and 70 percent of its population live in rural communities. Close proximity to Yerevan is an important factor in marz's economic development. The foundation of marz's economy is agriculture.

The Government of Armenia and the secretariat of the Board of Trustees organized and held discussions on the preparation of Armenia's Millennium Challenge Account Program in Artashat town on July 27, 2004.

As a result of discussions, *the absence of an agricultural insurance system and anti-hale services were mentioned as the main problems, the problem of land salinity was also distinguished. Importance was also attached to job creation and reduction of unemployment. From the viewpoint of improving the business environment in the marz, it was recommended to improve the legal framework and create equal competition conditions.*

Participants attached particular importance to organizing the marketing of agricultural goods. Material-technical provisions of farms were also mentioned, mainly with regard to the poor conditions of the machinery-tractor fleet.