INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT
GLOBAL ENVIRONMENT FACILITY
GEF TRUST FUND – LAND DEGRADATION

Sustainable Land Management for Increased Productivity in Armenia SLMIP

For Official Use Only

Project design report

August 2015

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Currency equivalents

Monetary unit	=	Armenia Dram (AMD)
US$1.00	=	AMD 473.37 (June 2015)
EUR 1.00	=	AMD 537.90 (June 2015)
US$1.00	=	EUR 0.880 (June 2015)
EUR 1.00	=	US$1.136 (June 2015)

Weights and measures

1 kilogram (kg)	=	1,000 grams (g)
1,000 kg	=	2,204 pounds
1 kilometre (km)	=	0.62 mile
1 metre	=	1.09 yards
1 square metre	=	10.76 square feet
1 acre	=	0.405 hectare (ha)
1 ha	=	2.47 acres

Republic of Armenia

IFAD Funded Operations

The designations employed and the presentation of the material in this map do not imply the expression of any opinion whatsoever on the part of IFAD concerning the delimitation of the frontiers or boundaries, or the authorities thereof.

Map compiled by IFAD 12-04-2014

Abbreviations and acronyms

ADA	Armenia Development Agency
ADB	Asian Development Bank
ADS	Agriculture Development Strategy
AMD	Armenian Dram
AOAF	Armenia Organic Agriculture Foundation
APR	Annual Progress Report
ARC	Agriculture Research Centre
ANAU	Armenian National Agrarian University
ASRC	Agriculture Support Republic Centre
ATP	Armenia Tree Project
AWPB	Annual Work Plan and Budget
CA	Conservation Agriculture
CARD	Centre of Agriculture and Rural Development
CB	Capacity Building
CBD	UN Convention on Biological Diversity
CC	Climate Change
CCD	UN Convention to Combat Desertification
CDM	Clean Development Mechanism
COP	Conference of Parties
COSOP	Country Strategic Opportunities Programme
CWS	Community Water Supply
ECU	Eurasian Customs Union
ED	Engineering Division
EDMC	Enterprise Development and Market Competitiveness Project
EEN	Enterprise Europe Network
EIA	Environmental Impact Assessment
EIT	Efficient Irrigation Technologies
EMAP	Edible, Medicinal and Aromatic Plants
EU	European Union
FAO	Food and Agriculture Organization
FED	Finance for Economic Development
FFS	Farmers Field School
FMAP	Farmers Market Access Programme
FREDA	Fund for Rural Economic Development in Armenia
FTA	Free-Trade Agreement
GAF	German-Armenian Fund
GDP	Gross Domestic Product
GEB	Global Environmental Benefit
GEFTF	Global Environmental Facility Trust Fund
GII	Gender Inequality Index
GIS	Geographic Informative System
GIZ	German Agency for Technical Cooperation
GoA	Government of Armenia
Ha	Hectare
IAD	Internal Audit Department
IFAD	International Fund for Agricultural Development
ILCSs	Integrated Living Conditions Surveys
IPM	Integrated Pest Management
IRFSP	Infrastructure and Rural Finance Support Programme
IRR	Internal Rate of Return
ISEP	Irrigation System Enhancement Project
IW	Inception Workshop
M	Million
MASC	Marz Agricultural Support Centres
MFI	Microfinance Institution
M&E	Monitoring and Evaluation
MCA	Millennium Challenge Account
MoA	Ministry of Agriculture

MoF	Ministry of Finance
MNP	Ministry of Nature Protection
MTA	Ministry of Territorial Administration
NCB	National Competitive Bidding
NCSA	National Capacity Self-Assessment
NFP	National Forest Programme
NFPS	National Forest Policy and Strategy
NPCD	National Plan to Combat Desertification
NPV	Net Present Value
NR	Natural Resources
NRM	Natural Resources Management
NSS	National Statistical Service
NWFP	Non-Wood Forest Product
OA	Organic Agriculture
OFID	Organization of Petroleum Exporting Countries Fund for International Development
PAs	Programme Accounts
PCB	Participating Commercial Bank
PCR	Project Completion Report
PIM	Project Implementation Manual
PIR	Project Implementation Review
PIU	Project Implementation Unit
PPL	Public Procurement Law
PRSP	Poverty Reduction Strategy programme
PSC	Programme Steering Committee
RA	Republic of Armenia
RACP	Rural Asset Creation Programme
RAEDP	Rural Areas Economic Development Programme
RAWI	Rural Areas Water Infrastructure
RFF	Rural Finance Facility
SDS	Sustainable Development Strategy
SLM	Sustainable Land Management
SME	Small and Medium Enterprise
SMEDNC	SME Development National Centre
SRF	Strategic Result Framework
SSDA	Strategy for Sustainable Development Agriculture
TNC	Third National Communication to the UNFCCC
SNE	National Environmental Strategy
SRF	Strategic Result Framework
T	Tons
UNDP	UN Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States Dollar
VC	Value Chain
WB	World Bank
WUA	Water Users Association
Yr	Year

Executive Summary

1. Armenia is a small land-locked republic in the Southern Caucasus, bordered by Turkey, Iran, Georgia, and Azerbaijan. Its mainly mountainous territory covers an area of 29,800 km^2 that is administratively divided into 11 *marzes* (regions). The average altitude of the country is 1,800 m, with more than 90% of the territory above 1,000 m. Water resources are distributed very unevenly in terms of spatial and seasonal distribution, and are particularly scarce in the densely populated, central part of the country. The portion of Armenia that is suitable for agriculture comprises 1.39 million hectares (60% of the land) of which 35% is arable agricultural land. Over 80% of total agricultural production output depends on irrigation. The crop water deficit during the vegetation period cannot be supplied by soil moisture alone particularly for higher value crops, making irrigation necessary for most of the crops.

2. Over the past two decades, the performance of the Armenian economy ranged from a real GDP contraction of 42% following the collapse of the former Soviet Union, to sustained annual growth rates of over 10% between 2001 and 2008. However the advent of the global financial crisis in 2008, combined with a reduction in remittances, again led to a sharp contraction of the economy in 2009. The global economic crisis in 2008/2009 is responsible for the increase of poverty up to a maximum of 35.8% (36% in rural areas) in 2010, with a steadily decline to 32% in 2013 but well above the 25% level achieved in 2007. Poverty and unemployment led to a huge wave of migration from Armenia, with approximately one million people, a quarter of the population, leaving the country since 1990. The situation is particularly difficult for rural women, where the lack of male family labour limits the labour-intensive field cultivation and animal rearing, which affects especially the livelihoods of women-headed households. Unemployment is particularly high among youth. High youth unemployment is a symptom of the difficult entry of this segment of the society into the labour market.

3. In 2013, agriculture constituted about 21.9% of GDP, and has remained at that level for several years. This sector, including livestock and downstream processing of agricultural products, is the main source of livelihoods for rural communities. Out of total 915 communities of Armenia 866 are rural (around 36.0% of the country population resides in villages), hence agriculture plays an important strategic role also in terms of rural area development. The agriculture area irrigated by the 44 Water Use Associations (WUAS) operating in Armenia is 130,180 ha (2012). This represents only a 62% of the total command area of the schemes under the management of WUAs as per cadastral records, meaning that substantial areas under the command of primary canals are not currently irrigated. The underdeveloped tertiary distribution system is one of the main causes of the gap between the potential and the actually irrigated area under the WUAs.

4. Rural areas in Armenia are characterized by a number of constraints hindering the development of the agriculture sector. Armenia, with a predominant mountainous landform with arid climate conditions and vulnerable ecosystems, is highly sensitive to global environmental changes. Inadequate irrigation and soil cultivation practices, overexploitation of the underground water resources, and mining activities in natural saline soils, are the main causes of erosion, salinization, and degradation. According to the World Bank assessment, Armenia is among the most sensitive countries in the Europe and Central Asia Region in regard to climate change, which has already exacerbated the high vulnerability to hazardous hydro-meteorological phenomena, causing huge damages to agriculture and crop losses of 10-15% in various regions of Armenia.

5. Since the 1990s, the Armenian Government has carried out liberal reform policies such as abolishing subsidies, liberalizing food prices, and liberalizing international trade, which had a significant impact on the agriculture sector. However, policy enforcement and implementation are inadequate, owing to limitations in resources, capacity, outreach, and/or relevant knowledge. As part of the recent comprehensive Armenia Development Strategy 2012-2025 (ADS), the Government of Armenia acknowledged that agriculture and rural development plays a key role in economic diversification, job creation, and poverty reduction. The Strategy focus on sustainable agriculture, and aims to forecast and mitigate the effects of natural disasters, as well as implement measures to mitigate the impacts of climate change. The *National Action Programme to Combat Desertification in Armenia calls*

for improved land use planning and improvement of economic mechanisms for natural resource management.

6. A new IFAD supported programme called the Infrastructure and Rural Finance Support Programme (IRFSP) was requested by the Government of Armenia to assist with continuing to resolve the widespread occurrence of poverty in the rural areas. Its overall objective is to improve the economic and social status of the population in selected rural areas where poverty is prevalent, by rehabilitating tertiary irrigation infrastructure, generating income growth and sustainable employment opportunities through strengthening the agricultural production systems and the forward and backward linkages of value chains for cash crops. The IRFSP Programme will be implemented over six years, starting in 2016.

7. The GEFTF project "Sustainable Land Management for Increased Productivity in Armenia" (SLMIP) builds on the IRFSP baseline programme and is fully blended with it, in order to integrate soil and water conservation measures in the development of the targeted high value agroforestry and vegetable crops, and restore the resilience to land degradation and climate-risks of the agro-ecosystems and the rural population in the project communal lands. The overall objective of the SLMIP project is "*to enhance the overall resilience of rural communities living in risk-prone areas of Armenia*", while the specific objective is "*to increase income and assets generated by smallholder farmers through investments in sustainable land management systems and technologies*".

8. The GEFTF/SLMIP strategy will be based on the following intervention lines: Component 1 – Investments in sustainable farming systems and technologies. The project will mainstream the adoption of climate-proof technologies in the tertiary irrigation systems rehabilitated by the baseline interventions, and support the conversion of marginal communal lands into climate-resilient agroforestry plantations, managed with efficient irrigation technologies and soil and water conservation agronomic systems and to improve the resilience of the baseline agriculture production interventions. Moreover, this component will specifically target women groups and support them with start-up packages to help diversify their livelihoods in the family farmland plots to increase their food and nutritional security. Component 2 – Community-led land degradation prevention through landscape restoration interventions. The project will adopt an ecosystem-based landscape approach to identify vulnerable sites to land degradation and implement integrated landscape restoration interventions to enhance the functionality and durability of the irrigation schemes, prevent soil erosion degradation, and improve vegetation cover along water courses, catchment areas and mountain slopes. The final goal is to restore the environmental services supporting rural development in the target areas, and provide environmental, social and economic benefits from multipurpose restoration interventions. This component will also create opportunities for income diversification from the production, processing and marketing of wild products, such as those derived from beekeeping, supporting the creation and strengthening of youth associations making an economic use of the restored communal lands. Component 3 – Enabling environment to enhance the capacity of smallholder farmers against land degradation. The project will create an enabling environment to enhance the capacity of smallholder farmers, decision makers and all relevant actors, to incorporate good practices in agriculture production and landscape restoration that help mitigate desertification and land degradation problems. Training programmes will be designed and implemented for women and youth. This component will also assess current policies and regulations, and crosscutting sectorial issues, that may facilitate or prevent the adoption of sustainable farming systems and landscape restoration measures to mitigate land degradation and climate-risks, and propose policy recommendations.

9. The target areas for the GEFTF intervention consist, initially, of nine municipalities located in the marzes of Syunik and Vayots Dzor in the south, and the marz of Ararat in the central-western part of the country. The project will specifically target the most vulnerable groups – women and unemployed youth – who will benefit from the communal land improvement, agriculture diversification measures and from job creation opportunities linked to the establishment of small business. The project will support the organization, institutional development and training of farmers around professional organizations, such as water users' associations, cooperatives and micro-enterprises, by their management capacities and linkages with the market. The project will have a major focus on the transfer of knowhow and the building of the skills needed to adopt and implement land degradation and climate-risk mitigation measures. GEO referred trainings for trainers will

be organized in cooperation with IFAD and a specialist will be selected in consultation with IFAD

10. The Project was developed in accordance with GEF eligibility criteria and respects the principle of national ownership, having been developed in consultation with national stakeholders, and taking into account all relevant recent studies and reports available on Armenia's desertification, land degradation, and climate change adaptation needs. In addition, the project was designed to fully address the priorities for the agriculture sector identified by the Government in several governmental reports (ADS, NPCD, NFP, TNC) and has been developed in such a way as to ensure sustainability and replicability beyond project completion.

11. The Project, in alignment with the mandates of GEFTF programming on Land Degradation, focuses on identifying, implementing, and transferring best practices in sustainable land management and ecological restoration in support of rural livelihoods. With funding from GEFTF, the IRFSP baseline project as a whole will become an innovative programme in which rural communities put into practice resilient farming systems and technologies to land degradation and climate-risks by means of experimental pathways, including economic ones.

12. The GEFTF grant of USD 3,937,500 will be matched by a IRFSP baseline contribution summing an IFAD soft loan of USD 5.9 million, IFAD grants of USD 350,000, and OFID loan of USD 23.2 million – with a total estimated cost of USD 33,410,500 covering the GEFTF grant and the co-financing programme. The overall responsibility for planning, management and implementation of the Programme would rest with the existing IFAD Programme Implementation Unit (RAED PIU), which has been responsible for the successful management and implementation of all previous IFAD-financed projects and programmes in Armenia. The PIU will operate under the authority of the Prime Minister's office through a Programme Steering Committee. The GEFTF project will hire a Project Coordinator to ensure effective project coordination, implementation, management and full integration of the GEFTF Project into the IRFSP baseline interventions. Service providers and international and national technical assistance will be hired to support the implementation of the GEFTF project components, based on similar procurement procedures established by the IRFSP baseline project.

13. The project will establish formal links with complementary projects being implemented by the GOA and other donors, which have a direct relevance to the GEFTF. The GEFTF project will identify, demonstrate, validate and disseminate SLM systems and technologies and innovative ecological restoration measures to prevent land degradation problems damaging irrigation schemes, and affecting communal lands at the landscape level. Best practices and case studies from Armenia and elsewhere will be gathered and adapted to the context of the project intervention areas. Sustainability will be sought through a broad and deep capacity building programme, designed to create a critical mass of capacity for conservation agriculture at the national level, and among all actors – from institutional to grassroots. The sustainability of the project is also guaranteed by the full involvement and empowerment of smallholders throughout the various components of the project.

14. IFAD's specific role will be to lead the design process, and to ensure appropriate guidance during supervision of the programme, conduct impact assessments and studies to document the lessons learned so far. Results of the pilot actions will be disseminated widely within and outside the project area. Moreover, the project will be linked to on-going regional and global programmes to ensure exchanges and dissemination of information at a wider scale using the IFAD website, UNFCCC, GEF and other platforms for experience sharing.

Part I – Situation Analysis

A. Geographical and environmental context

1. Armenia is a small land-locked republic in the Southern Caucasus, bordered by Turkey, Iran, Georgia, and Azerbaijan. Its mainly mountainous territory covers an area of 29 800 km^2 that is administratively divided into 11 *marzes* (regions, including the capital Yerevan) and 915 communities (*hamaynkner*, singular *hamaynk*), of which 49 are urban and 866 are rural communities.

2. The average altitude of the country is 1,800 m, with more than 90% of the territory above 1,000 m. The great diversity and complexity of the geomorphology and bioclimatic conditions in the country has led to the formation of different mountain and semi-desert soil types. Due to a complex mountainous relief, Armenia is characterized by a very varied continental climate, with high fluctuations in annual and daily temperatures. In July-August, air temperature varies from about 22-26ºC in the lowlands, to 16-20ºC at mid altitudes, and up to 10ºC in the highlands. During winter, the mean daily temperature ranges from +1ºC in the lowlands to -13ºC in the highlands. The annual precipitation fluctuates from 250 mm in the arid regions, to 1,000 mm in the highlands where snow cover occurs over 5-6 months. The highest precipitation is between May and June.

3. Water resources in Armenia are distributed very unevenly in terms of spatial and seasonal distribution: about 55% of the total river flow comes from spring snow melt and rainfall; in dry years river flow is less than 65% of the one in an average year. Swamp and marshlands mainly occur in the northwest of the Lori plateau, Shurabad basin and Masrin and Ararat valleys, although most of them have been drained. There are more than 100 minor mountain lakes, most of them above 2,000 m that typically are used for watering pastures. Lake Sevan (about 35 billion m3) is intensively used for irrigation and energy generation. Some minor lakes are also used for irrigation and fish farming.

4. The following bioclimatic zones can be defined in Armenia:

5. Desert and semi-desert zone (10 % of the country): it occupies the Ararat valley and the lowlands adjacent to the foothills, at an altitudinal range between 600-1,300 m. Limited precipitation (up to 250 mm) and hot summer conditions result in xeric conditions and rapid soil water evaporation and salt accumulation in the upper soil layers. The vegetation is characterized by small shrubs, and perennial and ephemeral grasses. In areas with intense salinization halophytic vegetation predominates. Semi-deserts are the original habitat of important ancestors of domestic crops, such as *Triticum araraticum, T. urartu, Secale vavilovii, Aegilops* spp, among others.

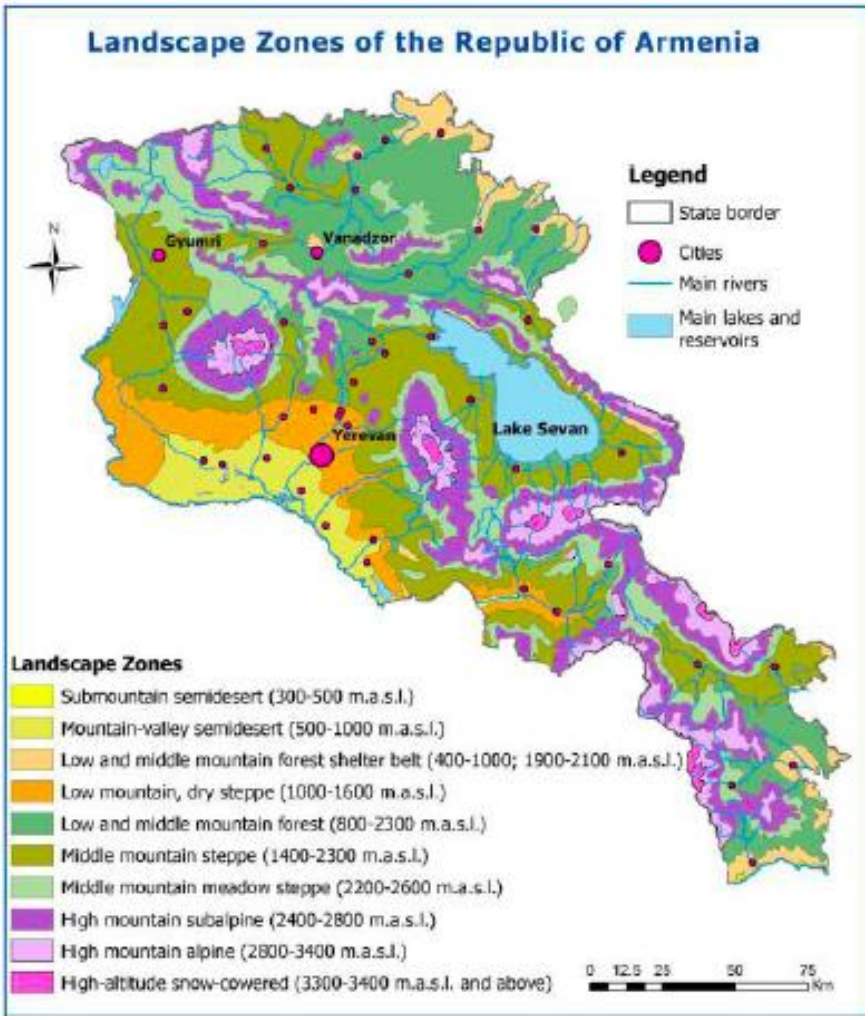
6. Mountain steppes (37% of the country): Meadow steppes occur in the highlands between 1,500 m and 2,500 m. Vegetation cover is characterized by a dense grass formation, and cushion shrubs. Patches of forests occur on ridge tops among the steppes in the northeast and Sjunik regions. Thunderstorms accompanied by hail are frequent during summer. Steeper and stony slopes are used for grazing while plains and lesser slopes are used for rainfed crops, such as cereals and potatoes.

7. Forest zone (20% of the country): currently forests in Armenia cover about 262,000 ha (9.3% of the country), mainly in the northeast (62% of forest cover), with lower representation in the southeast (36% of forest cover), and very marginal presence in the central part of the country (2%). Forests generally cover the mid-zone of mountains, at an altitudinal zone between 500 m and 2,100 m (2,500 m in the south). They are predominantly broadleaf oak formations (*Quercus macranthera, Q. iberica*), beech forests (*Fagus orientalis*) widespread in the northern part of the country, and hornbeam forests (*Carpinus caucasica*). Xeric forests are found in both the north (900 to 1,000 m) and south (1,800 to 2,000 m) of the country. These forests support around 80 species of xeric trees and scrubs, such as junipers, pistachio, almond, and the numerous local narrow endemic wild pear species among others. Riparian forests are characterized by poplar and elm species among others.

8. Sub-alpine and Alpine meadows (28% of the country): they occur between 2,300 and 3,400 m, representing the principal summer pastures. Overgrazing is declining productivity and causing the disappearance of endemic and rare species.

9. Armenia has over 3,500 species of plants, more than half of the 6,000 that can be found in the entire Trans-Caucasus region. Agro-biodiversity in Armenia is remarkable with a high number of economically valuable species: more than 200 edible plants; more than 2,000 forage species; about 350 melliferous species; about 350 medicinal plants; about 120 oil-bearing species; about 60 resin plant species. The territory of Armenia belongs to one of the Vavilov centres of origin of the ancestors of cultivated plants, in particular numerous species of cereals, vegetables such as cucurbits and oil-bearing plants, fruit trees (e.g. 32 pear species, 12 of them endemic to Armenia; 17 *Prunus* spp; 15 *Sorbus* spp; 2 *Amygdalus* spp), and fodder species (e.g. 23 *Lathyrus* species; 14 *Medicago* species; 24 *Onobrychis* species).

Figure 1. Bioclimatic zones of the Republic of Armenia



B. Socio-Economic Context

10. Armenia overcame the economic difficulties following the collapse of the former Soviet Union and political conflicts in the early 90s, and engaged on a steep development path. Over the past two decades, the performance of the Armenian economy ranged from a real GDP contraction of 42% following the collapse of the former Soviet Union, to sustained annual growth rates of over 10% between 2001 and 2008. However the advent of the global financial crisis in 2008, combined with a reduction in remittances, again led to a sharp contraction of the economy in 2009 when a contraction of 14% was recorded. Since then, economic growth has gradually picked up again, from 2.2% in 2010 to 4.7% in 2011, and 7.2% in 2012.

11. According to the Asian Development Bank, growth in Armenia slowed to 3.4% in 2014 from 3.5% in 2013. On the supply side, growth was led by agriculture and services. Agriculture expanded by 7.8% in 2014 despite an unseasonably cold spring that destroyed major fruit crops. Much of the growth came from expansion in the area cultivated and higher livestock production. Services rose by 5.2%, driven by gains in trade, food service, finance, insurance, recreation, and health care.

12. **Agriculture Sector**: About 40% of the country is not suitable for agriculture. The area suitable for agriculture comprises 1.39 million hectares of which 35% is arable agricultural land and very dependent on irrigation. The remainder is grasslands and pastures and perennial plantations. The main agricultural crops are cereal, potato, fruits, grape and vegetables, and the main livestock are cattle and sheep.

13. Agriculture constituted about 21.9% of GDP in 2013. The contribution of the sector has remained at that level for several years. The sector, including livestock and downstream processing of agricultural products, is the main source of livelihoods for rural communities. Out of total 915 communities of Armenia 866 are rural (around 36.0% of the country population resides in villages), hence agriculture plays an important strategic role also in terms of rural area development. As of 2012, agriculture employs 437,200 people, which accounts for 37% of the country's total employment and 80% of rural area employment.

14. Private farm households and commercial entities own 22.1% of agriculture land, 47% is under community ownership, and 30.2% belongs to the State. Some 335,000 households are involved in the sector, with an average landholding of around 1.4 ha per household and a diversified production system involving both crops and livestock. The agriculture sector provides employment to more than 44% of the country's economically active population, including 65% in rural areas (where 36% of the population resides).

15. The large number of small farms is a consequence of land reform as a result of the dissolution of the Soviet Union when State land in Armenia was distributed to the population. The existing farms are generally diversified in their production pattern, with a strong subsistence orientation, low formation of capital, limited access to markets and poorly maintained agricultural infrastructure, resulting in low value added productivity in the agricultural sector.

16. Over 80% of total agricultural production output in Armenia depends on irrigation. The crop water deficit during the vegetation period cannot be supplied by soil moisture alone particularly for higher value crops, making irrigation necessary for most of the crops. However the privatization of agriculture also led to the deterioration and abandonment of a large part of irrigation systems formerly used by the state farms because the on farm systems were not adapted to smallholder agriculture: The area currently irrigated by the 44 water users associations (WUAs) operating in Armenia is 130,180 ha (2012). This represents only a 62% of the total command area of the schemes under the management of WUAs as per cadastral records meaning that substantial areas under the command of primary canals are not currently irrigated. Almost 25% of the command area of the WUAs area is classified as "backyards", mainly consisting of household food production plots adjacent to the rural houses, averaging 0.17 ha.[1] These plots are an important element of food security for the poor households and to some extent contribute to increased family income by providing opportunities to generate a reliable surplus of fruits and vegetables for sale[2].

17. Livestock is a leading branch of Armenian agriculture: in the Ararat valley and suburban areas dairying is especially developed; in the mountains and foothills, along with cattle breeding, sheep rearing is also developed. Armenian forests are state owned and are managed by the Republican State Non-commercial Organization "Hayantar" of the Ministry of Agriculture and overseen by the MNP inspectorate, although other forms of ownership of newly established forests are possible.

18. **Poverty**: As of 2010, just over one third (36%) of Armenia's 3.1 million people live in rural areas and one third of the population lives in the capital city of Yerevan with the balance of the population in numerous small towns. The global economic crisis in 2008/2009 is responsible for the increase of poverty up to a maximum of 35.8% (36% in rural areas) in 2010, with a steadily decline to 32% (31.7% in rural areas) in 2013 but well above the 25% level achieved in 2007 (RA-NSS).

19. Rural poverty is a consequence of spatial discrepancies in terms of the availability of basic and productive infrastructure, particularly irrigation, which allows a more consistent production in most areas and usually more remunerating cropping patterns.

20. **Migration.** Poverty and unemployment led to a huge wave of migration from Armenia, with approximately one million people, a quarter of the population, leaving the country since 1990. Migration - both internal and to abroad – has been a key strategy for coping with

[1] Household Characteristics and Farmer Practices - Mathematica Policy research for MCA Armenia (Dec. 2008).

[2] The FMAP Supervision Mission Aide Memoire of September 2011 reports a 10% increase in household incomes from these plots.

poverty and lack of employment. Some 22% of the population lives in households with permanently absent members.

21. **Women.** Independence has brought new personal and social freedoms and women's participation in education remains high, but the migration of a large portion of the male workforce has increased vulnerability and pressures on the women who have remained behind to run the home, care for children and elderly or sick relatives. The situation is particularly difficult for rural women, where the lack of male family labour limits the labour intensive field cultivation and animal rearing, which affects especially the livelihoods of women-headed households.

22. Armenia has a Gender Inequality Index (GII) value of 0.325, ranking it 87 out of 148 countries in the 2013 index. The Global Gender Gap Index (World Economic Forum) scores Armenia relatively high for gender equality in educational attainment and health/survival, but very low in terms of economic participation and political empowerment. In rural areas women do not enjoy equal access to financial services, and often lack the support and advice to invest and channel them for better long-term advantage. While adult labour force participation rate for females is 51% (lower than 72% for males), female labour is intensely represented in agriculture with 45% of female employment in the sector (well above 33% of the share of male labour in the sector).

23. **Youth.** Unemployment is particularly high among youth. The unemployment rate among persons aged 20–24 is 38%. In rural areas the livelihood options for youth are particularly limited by (a) limited access to tertiary education and vocational training (in distant cities); (b) limited employment and migration opportunities (especially the poor often have difficulties to raise the money needed for travel, lodging, etc.); and (c) limited possibilities to engage in agricultural activities – youth typically lack finance, collateral for agricultural loans such as own land, which makes it particularly difficult for them to start farming.

C. Institutional Context, National Policies and Legislation

24. Some agricultural policies have had a significant impact shaping the agricultural sector. Since the 1990s, the Armenian Government has carried out liberal reform policies such as abolishing subsidies, liberalizing food prices, and liberalizing international trade. The government continues to support farmers with VAT and land tax exemptions, and subsidies for irrigation water and seed loans. Policy enforcement and implementation are inadequate, owing to limitations in resources, capacity, outreach, and/or relevant knowledge. Some examples of the most important agricultural programs are:

25. The adverse impact of poverty on environmental issues and sustainable growth, and the need to reverse environmental degradation are recognized in the Poverty Reduction Strategy Paper (PRSP) adopted by the Government in 2003. Within the scope of the PRSP document, the Government addresses issues related to (1) sustainable forest management, (2) prevention of land degradation, (3) sustainable management of water resources and restoration of ecological balance in Lake Sevan; and (4) management of waste and industrial pollution.

26. The Strategy on Sustainable Development of Agriculture (SSDA) developed in 2004 is a document that is linked to the Poverty Reduction Strategy Paper (PRSP). Certain parts of the SSDA focus on the environment, including limiting the use of fertilizers and other agro-chemicals, promoting soil conservation measures, improving water collection and irrigation methods, and improving pasture management. SSDA also aims to forecast and mitigate the effects of natural disasters, as well as implement measures to mitigate the impacts of climate change.

27. The Government’s Agricultural Development Strategy 2010-2025 (ADS) emphasizes the need for intensification of agriculture, and increasing the value added in agricultural and rural labour. Efforts have already been initiated for introducing an insurance system for agriculture production. Productive cooperation has been established between the MoA and “Armstatehydromet”, which regularly provides meteorological data and short- and mid-term weather forecasts and warning in the case of dangerous hydro-meteorological phenomena.

28. The 2005 Food Security Policy encompasses important environmental issues including climate change, desertification, biodiversity protection and biological security. The program includes: creating a data bank on natural resource use, assessing and monitoring of natural resources, developing and implementing land consolidation projects, regeneration of valuable and rare ecosystems, and creating early warning systems to prevent crop damage.

29. The Government's Sustainable Development Strategy 2012-2030 (SDS) with the strategic directions to ensure sustainable economic growth, implement a targeted social policy for improving populations' living standards, improve the effectiveness of governance, and ensure environmental protection and sustainable management of natural resources. Improvement of rural water supplies were specifically called for in the Strategy.

30. The *2002 National Action Programme to Combat Desertification in Armenia*, calling improved land use planning and improvement of economic mechanisms for natural resource management. The project will also support the implementation of the *10-year UNCCD Strategic Plan* especially Strategic Objective 2: To improve the condition of affected ecosystems, particularly Expected Impact 2.1: Land productivity and other ecosystem goods and services in affected areas are enhanced in a sustainable manner contributing to improved livelihoods; and Strategic Objective 3: To generate global benefits through effective implementation of the UNCCD, specifically Expected Impact 3.1: Sustainable land management and combating desertification/land degradation to the conservation and sustainable use of biodiversity and the mitigation of climate change.

31. The Third National Communication to the UNFCCC proposed adaptation technological measures to reduce losses from irrigation water supply systems, to apply advanced irrigation methods in agriculture (drip- subsurface irrigation, pivot irrigation, sprinkler irrigation, drip pipe irrigation, mole irrigation), to introduce drought and pest resistant locally adapted crops and varieties, to introduce early warning response system and climate index-based insurance system, to improve management of grasslands, and to implement soil and water conservation measures in farming systems.

32. A number of laws have been established to address the environment in farming practices. Specifically for water resource management and rehabilitation: a Water Code (2002) aims for sustainable, integrated water resource management; The Law "On the National Water Programme" (2006) that defines measures for meeting the demands of the population and the economy, ensuring ecological sustainability of the environment, forming and using strategic water reserve and protecting national water reserve through effective management of usable water resources; the Law on Water User Associations (WUAs) assists operations and maintenance of irrigation systems. The Law on Amelioration of Land, adopted in 2005, requires consideration of environmental impacts and foresees the rehabilitation of degraded lands for environmental, reforestation, or recreational purposes. Very limited resources are allocated to reduce erosion or to increase production on degraded land through shelterbelt-plantation and afforestation. Shelterbelt-forestry programs and afforestation initiatives may result in increased production of wood and NWFPs, which by itself could in many cases justify the required investments.

33. Overall, a National Forest Policy and Strategy (NFPS, 2004), a National Forest Program (NFP, 2005), and a new Forest Code (2005), aim at developing a framework for long-term sustainable forest management and forestland protection and restoration, by implementing institutional and legal reforms, and introducing international forest management and certification standards and forest evaluation criteria. The National Forest Policy makes the rehabilitation of degraded forest resources and protection of existing forests a priority for Armenia. The Forest Code also gives special attention to communal ownership of forests. Communal forests are supervised by local self-governing authorities, and special incentives stimulate the sustainable management of forests by the local population.

PART II. Threats and Root-Cause Analysis

34. Rural areas in Armenia are characterized by a number of constraints hindering the development of the agriculture sector: (i) limited diversification of rural off-farm activities which are currently contributing little to rural income and employment; (ii) the small size of farms and the slow formation of agriculture capital and rural development infrastructure have increased subsistence farming based on unsustainable practices; (iii) poor seed production system, insufficient and inadequate use of fertilizers and pesticides, old inefficient machinery with high operation costs, and poor farm practices; (iv) insufficient irrigation system rehabilitation, cross contamination with waste management water effluents into water channels, and insufficient adoption of good irrigation practices; (v) land degradation and serious problems concerning crop production and animal husbandry; (vi) uncontrolled wood cutting during the 1990s causing great damage to many forested areas and severe soil erosion problems; (vii) lack of access to and absence of sufficient rural financial services; (viii) insufficient access to basic services, irrigation water and infrastructure, thus constituting an important obstacle to economic and social development; (ix) low value-adding to agricultural

products along the value chain; (x) reduced social capital in organizational terms with populations that lack skills and means to take charge of their own development; (xi) limited awareness and know-how about appropriate technologies for small farmers and the rural poor; (xii) adaptation deficit, as farmers are not suitably adapted to current climate variability and predicted changes.

Environmental degradation

35. Armenia, with a predominant mountainous landform with arid climate conditions and vulnerable ecosystems, a particular history of droughts and uneven distribution of water resources, is among the most sensitive countries in the Europe and Central Asian Region to global environmental changes.

36. Soil erosion and secondary salinization are major threats in the semi-desert that was heavily converted into arable land (80-90 % of the territory). Inadequate irrigation and soil cultivation practices, overexploitation of the underground water resources (e.g. borehole water exploitation exceeds up to 4.5 times the annual allowable water use), and mining activities in natural saline soils, are the main causes of natural ecosystem degradation, drying of marshes, habitat and species loss, and desertification processes.

37. Overgrazing, land conversion into agriculture, uncontrolled harvesting of medicinal and edible species and human-made fires are responsible for a serious degradation and significant reduction of the area of natural pastures (e.g. from 1.4 million ha in 1940 to 804,500 ha in 2002[3]). Weed cover in pastures sometimes comprises 60-70 % of natural cover. The high cost of accessing distant pastures and fodder provision together with limited availability of labour, have increased pressure on pastures near villages. Declining livestock productivity has pushed households to generate income through increasing their livestock numbers, adding pressure on pastures.

38. According to FAO, between 1990 and 2010, Armenia lost an average of 4,250 ha (1.22%) of forestland per year, with a total loss of 85,000 ha (24.5%). Deforestation and forest degradation are mainly caused by large-scale timber logging, illegal harvesting of wood, firewood and NWFP, overgrazing, poor management, human-caused fires, and construction and mining deposits. As a consequence, soil erosion, landslides, avalanches, drying of springs, and formation of dust clouds, among other impacts, cause serious damages to the natural ecosystems and the rural communities. Forest protected areas are also under threat due to timber and NWFP are illegally harvested. Forest fires are exacerbated by climate change trends. The highest rates of fires were observed in 2006, 2010 and 2011, with a total territory of 1,617 ha burned between 2009-2013. The use of chemicals for the control of forest pests and diseases has in many cases a destructive effect on fauna and flora species.

39. Of the 464,300 ha of arable lands in Armenia, 20.3% are eroded. Inappropriate farming techniques and unsustainable extensive irrigation practices, especially on steep slopes in the meadow and steppe zones where shelterbelts do not exist, exacerbate erosion problems. Approximately 20% of irrigated areas in Armenia are affected by severe to moderate soil salinity, due to pour maintenance and operation of the irrigation system and inadequate irrigation practices. Soil salinization mainly occurs in the Ararat plain, where about 44% of the arable lands (35,000 ha) lands are salinized.

40. According to the World Bank assessment, Armenia is among the most sensitive countries in the Europe and Central Asia Region in regard to climate change. According to the TNC, the total river flow in Armenia will decrease 6.7% by 2030 and 14.5% by 2070. Snow precipitation shows a declining trend with a predicted reduction of 7-11% by 2030 and 20-40% by 2070. By 2030, a decline of 8-14% in the yields of the main agriculture crops, and of 4-10% in the yields of pastures is forecasted. Soil humidity will reduce by 10-30%, moisture reserves of various crops will decline by 7-13%, and the water deficit of land will increase by 25-30%. The areas needing irrigation will expand in current rain-fed areas, and increased evaporation will result in higher soil salinization. This may result in rises in the price of irrigation water conditioned by its growing scarcity. The higher frequency and intensity of heavy rainfall and floods will intensify water erosion, and droughts and southern winds will cause further wind erosion.

41. Climate change has already exacerbated the high vulnerability of Armenia to hazardous hydro-meteorological phenomena, namely during spring and summer, causing huge damages to agriculture and crop losses of 10-15% in various regions of Armenia. Drought aggravated by

[3] UNECE (2002) National Report on the State of the Environment in Armenia

southern winds and late spring frost mostly threatens Ararat and Armavir marzes, while hail is most dangerous in Shirak, Aragatsotn and Armavir marzes. Severe droughts exacerbated by southern winds were periodically recorded in the last 15 years, such as in year 2000 that caused a damage of 38 billion AMD, and in 2008 that caused extensive losses in agriculture production (USD 40 million). Climate change will also exacerbate forest regeneration and growth decline, pest outbreaks, dieback and forest fire risk.

Figure 2. Desertification map (National Plan to Combat Desertification in Armenia, 2002)

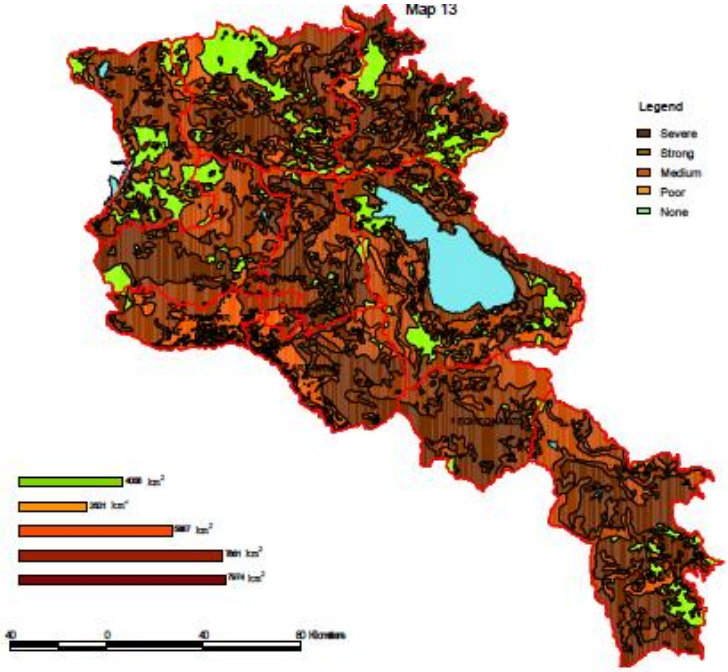
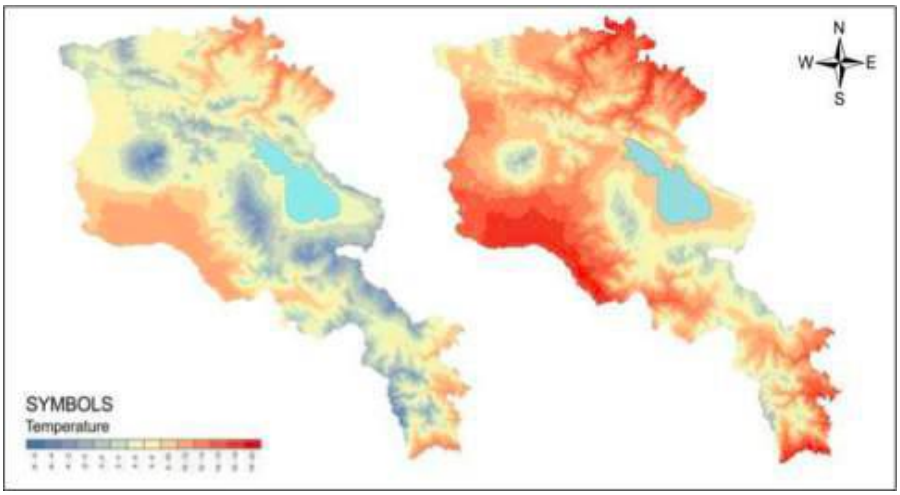


Figure 3. Annual average temperature distribution in Armenia: (a) 1961-1990; (b) projections for 2071-2100 (RCP 8.5 scenario) (Third National Communication to UNFCCC)



42. According to the TNC, around 80% of land plots in Armenia are characterized by various levels of land degradation, as a result of the irrational use of land resources: 50% of the territory is affected by different erosion rates, mainly in the marzes of Aragatsotn, Kotayk, Lori, Syunik and Vayots Dzor; 30% is affected by mudflows – e.g. 30% of the Ararat plain - and floods; 17% is affected by hail; 3% is affected by landslides, mainly in the Akhuryan, Debed, Vedi, Getik and Vorotan basins.

Part III. Baseline Analysis

43. As part of the recent comprehensive Armenia Development Strategy 2012-2025 (ADS), the Government of Armenia acknowledged that agriculture and rural development plays a key role in economic diversification, job creation, and poverty reduction. The Strategy focus on

sustainable agriculture, by promoting soil conservation measures, improving water collection and irrigation methods, limiting the use of fertilizers and other agro-chemicals, and improving pasture management. The Strategy also aims to forecast and mitigate the effects of natural disasters, as well as implement measures to mitigate the impacts of climate change.

44. A large share of public investments in the irrigation sector has been therefore geared to the rehabilitation of the main structures in economically viable, non-energy-intensive schemes. The expansion of irrigated land areas and higher efficiency of the systems would be at the core of the investment policy in irrigation until 2025. Investments in irrigation carried out under completed IFAD Programmes gave a positive contribution to increasing agricultural productivity[4] mainly in terms of utilization of agricultural land, higher yields and to some extent shifts from low value field crops to cultivation of high value crops. However, the shifts of cropping patterns need to be supported by extension and awareness raising focusing on: (i) the potential opportunities for the cultivation of high value crops specific to each agro-ecological zone; and (ii) access to credit for farm development.[5] This is particularly relevant to maximize the benefits arising from the expansion of the irrigated farmlands, where low value annual field crops would be otherwise prevailing, as shown by the FMAP PCR interim results.

45. IFAD played a key role in the establishment and the development of the appropriate legal framework for WUAs in Armenia, initiated under the Irrigation Rehabilitation Project (IRP)[6] and continued with the subsequent North-West Agricultural Service Project (NWASP) and Agricultural Service Project (ASP), completed in 2006. WUA establishment and capacity building has been taken over up-scaled under successive projects in the irrigation sector financed by the World Bank. While formally well established, and showing progressively improved performance in service delivery, the WUAs need strengthening, both in the technical capacity of their executive bodies and in their governance in order to be fully in line with the IFAD's Participatory Water Management principles. These are fully acknowledged as aspects requiring further actions by the SG and have been addressed in the design of the latest WB project in the irrigation sector.

46. Following the construction or rehabilitation of primary and secondary irrigation facilities, the uptake of benefits from smallholders have proven slower than anticipated. Extending the irrigation distribution system up to field edge has proven a key requirement for the development of upgraded orchards under the IFAD supported RACP "Fruit Armenia" Component. An immediate uptake of irrigation and increased yields (+30%) are recorded in the backyards, which are an important element of food security for the poor households and to some extent contribute to increased family income. [7]

47. A new IFAD supported programme called the *Infrastructure and Rural Finance Support Programme* (IRFSP) was requested by the Government of Armenia (GOA) to assist with continuing to resolve the widespread occurrence of poverty in the rural areas. The Government indicated a strong interest for IFAD to help design the Programme as a potential IFAD/OFID co-financed operation, and include in this new Programme successful components of previous IFAD/OFID operations in Armenia i.e. rural infrastructure improvement and the provision of rural finance. The request was for the Programme to be designed to support smallholders as well as small and medium size enterprises (SMEs) at the production and processing levels of agricultural value chains. Armenia has already demonstrated a good capacity to implement development activities with IFAD/OFID in these areas in previous projects through the experienced existing Rural Areas Economic Development Programmes Implementation Unit (RAED-PIU) (for infrastructure development and overall management) and for rural finance through two independent units already supported by IFAD from their start and fully operational: the Rural Finance Facility (RFF) and the Fund for Rural Economic Development in Armenia (FREDA). The current good performance of these three organizations gives confidence that the capacity is in place to launch the new IRFSP programme.

48. The main target group for IRFSP will typically be poor farmers and rural households that cultivate crops under mainly rainfed conditions within the command area of obsolete or

[4] RAEDP Project Performance Assessment IFAD Independent Office of Evaluation June 2012.

[5] See also RAEDP Programme Completion Report, October 2010.

[6] The IRP was the first IFAD-funded operation in the country back in 1995.

[7] The FMAP Supervision Mission Aide Memoire (Sept 2011) reports a 10% increase in household incomes from these plots.

inefficient previously state run irrigation schemes. The main current coping strategies of this group include migration and a focus on subsistence agriculture activities. Agricultural activities are constrained by the lack of access to irrigation water, rural financial services, new technological packages and inputs, as well as production and business related skills. Targeting would give specific consideration to vulnerable women-headed households and youth by mobilizing awareness and support activities for these groups to enable them to take advantage of opportunities provided by the Programme.

49. The IRFSP Programme would be implemented over six years, starting in 2015. Given the small nature of proposed tertiary irrigation infrastructure works and their dispersed locations, a demand based programmatic approach for infrastructure would be adopted for this component**.** The rural finance components would also be demand based. Investments would in all cases be subject to fulfilling selection criteria that were agreed between IFAD and GoA during Final Design.

50. The overall objective of the IRFSP Programme is to improve the economic and social status of the population in selected rural areas where poverty is prevalent, by generating income growth and sustainable employment opportunities through strengthening the agricultural production systems and the forward and backward linkages of value chains for cash crops. The Programme has four components: (i) Rural Finance; (ii) Rural Water Infrastructure; (iii) Farmer Awareness and Support; (iv) Programme Management. The Programme, with an IFAD funding of a loan of USD 11 million and a grant of USD 350,000, as well as an OFID funding of a loan of USD 25 million, would provide improved economic opportunities and an improved standard of living for some 16,000 households or around 67,000 people (about 7% of the rural population of Armenia, and an estimated 21% of Armenia's rural poor).

Part IV. Stakeholder Analysis, Project Area and Target Group

A. Stakeholder Analysis

51. The main governmental institutions involved in the development and implementation of policies in the agriculture sector are as follows: (a) **The Ministry of Agriculture (MoA)** is responsible for developing and implementing policies in the agriculture, forestry and fishery sector and supports agricultural extension through a network of MASC's;[8] (b) **The Ministry of Natural Protection (MNP)** has the primary responsibility for the protection, sustainable use, and regeneration of natural resources including water and implementation of number of environmental conventions ratified by the Republic of Armenia In those areas, the MNP's authority includes overseeing national policy development, developing environmental standards and guidelines, and enforcement; (c) **The Ministry of Territorial Administration (MTA)** is responsible for the development implementation of policies related to the management of lands in Armenia. The MTA supervises territorial administration bodies and provides information about the territorial development programs of regional and local entities to the government, maintaining a database with relevant aggregate socioeconomic indicators for all the rural communities in Armenia; (d) **The Ministry of Economy** is responsible for widening and deepening of the country's integration into the world economy. The Ministry has the competence for developing the strategy and the annual programmes of the *Small and Medium Entrepreneurship Development National Centre of Armenia* Fund (SME DNC), which is a priority for the GOA. The Centre provides technical, informational and financial support to micro, small, and medium enterprises.

52. At the regional (marz) level there are agriculture and environmental protection departments, whose function is to support regional and environmental programmes, participate in the regional socio-development programme preparation, and assess major agriculture problems and natural disasters, producing recommendations to be submitted to the Government. **Local authorities**[9] are fully responsible of all aspects related to the day-by-day management and exploitation of all public lands within their boundaries.

[8] MASC: Marz Agricultural Support Centers: The Armenian Extension Service, a private extension system, was established and funded by USDA in 1992-96. With the support from World Bank loan, the Ministry of Agriculture restructured the Armenian Extension Service into state owned, but decentralized and profit seeking Marz Agricultural Support Centers (MASCs). Ten MASCs and a Republican Agricultural Support Center (RASC) are now established with about 300 staff in total.

[9] Local authorities consist of a Head of the Community ("mayor") and a Community Council that are elected by community members for four year terms. The number of members of the Community Council depends on the population number and varies between 5 and 15.

53. The **Agriculture Support Republic Centre** (ASRC) is a national organization established by the Government in 2002, aiming to facilitate and support capacity building and research-advisory-farmer linkages by providing information and advice on the latest research and technology achievements. ASRC closely works with the so call Agriculture Support Centres (GAMKs) located in each of the 10 regions of Armenia to provide agriculture extension services. Their inefficient structure and lack of financing results in a limited capacity. The **Armenian Development Agency** (ADA) is a state agency with the mission to attract and support foreign investors, and promote Armenian products abroad, support business and investment climate improvement.

54. A joint effort of the Armenian Government and FAO have resulted in the establishment of AGRO.AM Network[10] – a nation-wide web platform for communication and exchange of information and data between the leading national agricultural research and extension institutions and professionals in Armenia. In 2009, FAO in collaboration with the MoA, launched the Project for the *Establishment of a Virtual Extension and Research Information and Communication Network* (VERCON) in Armenia. Under the project, it was intended to create a common web-based information sharing and communication platform for Armenian research and advisory institutions, equipping them with efficient networking tools and capacities to help improve quality of the advisory services provided to farmers.

55. The Armenian **National Agrarian University** (ANAU) prepares graduates in agriculture and forestry disciplines, participates in policy formulation, capacity building, consulting and advisory services, and collaborates with bilateral and multilateral donor agencies and foreign universities. It has good facilities and maintains two experimental/demonstration plots in Kotayq and Armavir marzs. Armenia also has a significant number of regional Agricultural Research Centres (ARCs), which were established within the framework of the World Bank-financed Agricultural Reform Support Project, and are located in all of its *marzes*, covering different research areas (e.g. RC for Agriculture and Plant Protection, in Ejmiatsin; RC for Animal Husbandry and Veterinary, in Nor Geghi, Kotaiq Region; RC for Grape, Fruit Growing and Wine-making, in Merdzavan, Armavir Region; RC for Vegetables and Technical Crops, in Darakert, Masis Region; RC for Soil Science, Agro Chemistry and Melioration, in Yerevan; and RC for Bee Keeping, in Arinj, Yerevan).

56. **Civil society organizations** are active stakeholders of agriculture and rural reforms, operating in the majority of regions of the country since 10-15 years, such as: the Centre of Agricultural and Rural Development (CARD), Green Lane, Shen, Armenian Organic Agriculture Foundation (AOAF), OXFAM, Heifer International, Save the Children, World Vision, among others. They provide advocacy, support for agricultural and community development, capacity building, extension services, consultancy services, etc.

57. A number of national and international NGOs are supporting biodiversity conservation and forestry issues in Armenia. Community-based forest restoration actions are implemented throughout the country by the *Armenian Tree Project* (ATP) since 1994; forest landscape restoration addressing the natural habitats of critically endangered flora and fauna species is implemented by WWF in northern Armenia; The Armenian Forests NGO has planted since 1999 several hundred thousand trees in Armenia; A UNDP/GEF project has established three pilot sites in south-eastern Armenia on forest rehabilitation to enhance resilience to climate change. ATP has partnered with the Armenian Forests NGO, WWF Armenia and American University of Armenia's Environmental Research and Management Centre (ERMC), forming the Eco-Armenia Alliance. The European Neighbourhood and Partnership Instrument East Countries Forest Law Enforcement and Governance II Program (ENPI-FLEG 2) is supported by the European Union and implemented by IUCN, World Bank and WWF in Armenia.

58. **Farmer Organizations and Cooperatives**, such as the Federation of Agricultural Associations, National farmers Union, Meat Producers Association, Milk Producers Association, Agrarian Farmer Union, Farmer Movement, Union of Agricultural Cooperatives, Armenian National Organic Association, Greenhouse Association, among others. There are about 109 rural cooperatives involved in dairy, fruit and vegetable production, etc. Many of them are grant-oriented, lacking a business mentality necessary to successfully produce and market.

59. **Water Users Associations (WUA)** are non-profit organizations established voluntarily by water users, and Water Users Federations (WUF) are voluntarily established union of WUAs. WUA curry out the operation and maintenance of irrigation systems, and supply water tu

[10] www.agro.am

users located in the geographical territory served by them. The area irrigated by the 44 WUAs operating in Armenia is 130,180 ha (2012). This represents only a 62% of the total command area of the schemes under the management of WUAs as per cadastral records meaning that substantial areas under the command of primary canals are not currently irrigated.

60. **Service Providers and Professional Unions**: A number of organizations (e.g. Oxfam, Green Lane, CARD, Ecoglobe) offer a set of agribusiness services to the agriculture sector in Armenia on agribusiness and marketing, rural development, organic certification services, international trade and capacity building support and food safety, and provides high quality inputs, machinery and equipment, as well as agriculture finance.

61. The **private sector** is yet another important stakeholder. The larger entities, like exporters, processors, wholesalers deal with the large base of small supplier farmers, therefore, their development eventually affects the well-being and progress of small farms. Large producers, processors, exporters and other private businesses may be the good partners for establishing private-public partnerships and support development of the farmers.

B. Target Areas

62. The target areas[11] for the GEF intervention consist of nine initial municipalities located in the marzes of Syunik and Vayots Dzor in the south, and the marz of Ararat in the central-western part of the country. Target areas have been selected from a pool of over 30 different sites. Project's site selection was done on the bases of the following criteria:

Selection criteria for investments in water-efficient irrigation technologies	Selection criteria for investments in land degradation prevention
1. Availability of main water source 2. Significant number of beneficiaries 3. Irrigation potential of at least 30 ha 4. Communal land for grants 5. Individual small farmers or cooperatives for grants 6. Reasonable cost per beneficiary[12]	1. Communal land of at least 7 ha (not fragmented) 2. Significant of degradation based on mapping and soil analysis 3. Risk of land slides 4. High salinity levels 5. Significant number of beneficiaries 6. Conservation of land use and ecological nature 7. Level of investment 8. Demonstration of different interventions for different land degradation issues

63. Depending on funds availability other areas might be included in the project following the same selection criteria.

Table 1. Land uses and land degradation in the target municipalities[13]

Marz	**Vayots Dzor**		**Syunik**			**Ararat**			
Municipality	Arpi	Zaritap	Spandaryan	Harjis	Darpas	Shahumyan	Surenavan	Nor-Ughi	Pogr-Vedi
Total land (ha)	1359	5412	4663	3388	2227	1848	3353	294	1601
Arable Land (ha)	291	485	749	1154	670	363	1157	70	780
Irrigated Land (ha)	264 (f)	150 (f)	49 (f)	0	0	550 (f)	1215 (f)	70 (f)	Na
Annual cereal crops (ha)	63	100	144	720	269	54	27	10	Na
Vegetable-melon (ha)	8	50	Nm	21	67	58	97	10	Na
Fruit tree	36	80	Nm	16	44	44	253	28	Na

[11] A complete atlas describing the initial target areas is presented in Annex 6.

[12] Small scale infrastructure.

[13] List of acronyms: f: flood irrigation; s: sparse forest; d: dense forest; p: newly planted forest; Nm: not measurable; Na: not available data; CCI: Collapse Irrigation System/Insufficient Irrigation; SSC: Steep Slope Cultivation; SP: Salinization Problem; LAM: Lack of Agriculture Machinery and techniques; OG: Over-Grazing.

(ha)									
Perennial Fodder (ha)	12	100	12	280	280	55	80	10	Na
Pastures (ha)	203	30505	2530	2218	867	503	568	22	Na
Livestock	982	1508	2073	3610	1881	2342	4930	370	942
Bee-hives	640	899	598	1050	450	15	20	70	260
Forest (ha)	11 (s)	-	139 (s)	160 (d)	271 (d)	-	-	-	Na
Eroded land	42 ha OG	50% arable land OG	>100 ha SSC	<250 ha SSC	<870 ha	100 ha	40 ha	15% ara-ble land	
Water	CII	CII	CII	CII				CII	SP;CII
Other			LAM	LF	LAM				

64. **Ararat marz** is located in the semi-desert bioclimatic zone that characterizes the Ararat valley - large depression bounded in the north and east by mountain massifs of mainly volcanic rocks - with an altitudinal range between 800-1,300 m. It is characterized by arid conditions, with moisture deficiency and significant evaporation. Annual precipitation ranges from 200 to 250 mm, the hottest and driest months are July and August, when the average temperature is about 26°C (up to 40°C), and the lowest temperatures occur in January and February, when there is an average low temperature of -7°C (up to -31°C in some places). Four main categories of semi-desert ecosystems – sandy, clayey, rocky and saline - occur in the Ararat valley. Dry and hot continental climate, thin vegetation cover and rich foundations of lava deposits have led to the formation of underdeveloped brown semi-desert soils with poor humus content and prone to natural and anthropogenic erosion.

Figure 4. Google Earth maps of the target municipalities in Ararat marz.

Surenavan Municipality (Ararat Marz)

Nor Ughi Municipality (Ararat Marz)

Shahumyan & Pokr Vedi Municipalities (Ararat Marz)

65. The Arart marz extends over 2,096 km2 (7% of RA), with 887 km2 of agriculture land, including 299.6 km2 of arable land. It has 4 urban communities (82,500 people) and 94 village settlements (197,200 people). Ararat valley has the highest crop sales and harvest values, primary due to the production of fruits, tomatoes, grapes and vegetables, and beekeeping. Ararat Valley generates 50% of Armenia's agricultural production and 33.2% of average gross agricultural output. This zone is close to the largest markets in Yerevan, so there are greater opportunities to sell high value agriculture crops.

66. The main problems affecting agriculture development in the Ararat marz are: an obsolete, deteriorated irrigation and drainage system, inefficient use of water, poor farming practices, lack of adequate technology, and weak investments in high value agriculture production, resulting in low income and land degradation problems, including soil erosion and salinization. All this is exacerbated by climate change trends.

67. Four municipalities are targeted in Ararat marz: Surenavan, Nor-Ughi, Shahumyan and Pokr Vedi, all of them located close in the western part of the province, close to the border with

Turkey. The total population of the 4 municipalities is 11,375 people, with a major involvement in agriculture activities. The predominant grown crops are grapes, vegetables (tomato, potato, eggplant, pepper, cucumber, radish, onion), fruits (apple, quince, pear, apricot, peach, plum, cherry, sour cherry), melon, watermelon, squash and berries (strawberry, blackcurrant, redcurrant). Unsustainable irrigation practices together with the collapse of the irrigation infrastructure have resulted in extensive salinization and soil erosion problems in community lands, and land abandonment. The overuse of underground water and drainage has damaged important wetlands in the area. There is an important Ramsar site in Pokr Vedi (Khor Virap marsh, with 351 ha) of semi-artificial origin fed by an irrigation canal and surrounded by drainage channels of high international importance for over 100 species of migratory birds (30 breeding species) and mammals such as Jungle cat and otter. The marsh, that plays a significant role in flood mitigation downstream and in sediment trapping, is threatened by a decrease in water level due to unsustainable use of water for irrigation, overgrazing, fire events during the winter period, and poaching. As per assessment of IFAD/GEF mission, decision was taken to limit the project interventions in a way that they not have unfavourable impact on the Ramsar site (e.g. capacity building actions on efficient irrigation techniques compatible with the conservation of the Ramsar site; restoration of windbreaks and halophytic vegetation with multipurpose ecological and socio-economic benefits; support to women groups on the production of vegetables in greenhouses avoiding negative impacts on soil and water conservation).

68. **Vayots Dzor marz** is characterized by the mountain steppe bio-climate type, between 1,300 and 1,800 m of altitude. Vegetation is mostly formed of grasses (*Festuca spp, Stipa spp*.) and cushion shrubs, in some cases as a result of deforestation. Chestnut soils predominate, in most cases exposed to erosion processes. Vayots Dzor occupies 2,308 km2 (7.8% of RA), with 772 km2 of agriculture land, including 206 km2 of arable land. It has 3 urban communities (18,500 people), 41 rural communities and 52 village settlements (33,900 people). The main agriculture activities are grapes, fruit trees, vegetables, animal husbandry and beekeeping.

Figure 5. Google Earth view of Arpi and Zaritap municipalities in Vayots Dzor marz.

Zaritap Municipality (Vayots Dzor Marz)

Arpi Municipality (Vayots Dzor Marz)

69. The main problems affecting agriculture development in Vayots Dzor marz are: an obsolete, deteriorated irrigation and drainage system, inefficient use of water, unsustainable pasture-forest and farming management practices, lack of adequate machinery and technology, and weak presence of agriculture processing enterprises, resulting in low income and land degradation/soil erosion problems. All this is exacerbated by climate change trends.

70. Two municipalities are targeted in Vayots Dzor marz: Zaritap with 53.46 km2, located in the southern part of the province in the Pshonk river watershed; and Arpi with 10.56 km2, located in the north-western part of the province in the Arpa river watershed. The total population of the municipality is 1,283 people. The predominant grown crops are vegetables (*tomato, potato, eggplant, cucumber, pepper),* fruits (apple, apricot, peach, plum, sour cherry, walnut)*,* fodder perennial crops (alfalfa), grapes, melons, and berries (*strawberry, blackcurrant, and red currant)*). Unsustainable farming practices and overexploitation of forests and grasslands have resulted in soil erosion problems and land abandonment.

71. **Syunik marz** is characterized by the mountain forest and high mountain meadows bio-climate types, between 1,800 and 2,300 m of altitude. Vegetation is mostly formed of mixed deciduous forest (*Quercus macranthera, Q. iberica, Fraxiuns excelsior, Acer ibericum, Ulmus suberosus, Carpinus betulus*) and dry forests (*Juniperus spp, Pistacia mutica, Amygdalus fenzlianum, Acer campestre, Pyrus* spp.). Cinnamonic forest soils are often deteriorated due to unsustainable agroforestry and grazing activities in steep slopes. Syunik occupies 4,506 km2 (15.1% of RA), with 1,922 km2 of agriculture land, including 484 km2 of arable land. It has 7 urban communities (103,600 people), 106 rural communities and 127 village settlements (49,400 people). The main agriculture activities are fruit trees, vegetables, fodder crops, animal husbandry and beekeeping.

72. The main problems affecting agriculture development in Syunik marz are: an obsolete, deteriorated irrigation and drainage system, inefficient use of water, unsustainable pasture-forest and farming management practices, lack of adequate machinery and technology, and weak presence of agriculture processing enterprises, resulting in low income and land degradation/soil erosion problems. All this is exacerbated by climate change trends.

73. Three municipalities are targeted in Syunik marz: Harjis, Darbas and Spandaryan, located in the central (the two first ones) and northern (the last one) parts of the province. The total population of the 3 municipalities is 2,112 people, with a major involvement in agriculture activities. The predominant grown crops are vegetables (cabbage, tomato, potato, eggplant, cucumber, onion, pea, chard), fruits (apple, apricot, plum, sour cherry, walnut), and fodder perennial crops (*alfalfa, sainfoin*). Unsustainable farming practices, overexploitation of natural forests and grasslands and deforestation have resulted in extensive soil erosion problems in the steep slopes and ravines surrounding the cultivated plateaus and the river valleys.

Figure 6. Google Earth view of the target municipalities in Syunik marz.

Harzhis & Darbas Municipalities (Syunik Marz)

Spandaryan Municipality (Syunik Marz)

C. Target groups

74. The main target group are poor farmers and rural households that cultivate crops - mainly under rainfed conditions - in the command area of obsolete or inefficient ex-state run irrigation schemes. The livelihoods of many of these rural poor have been severely affected by a number of politically induced shocks in the last two decades, which resulted in a drastic loss of income from employment (mainly in the manufacturing industry and mines, and state-owned agribusiness), and agricultural activities. The main coping strategies include migration abroad and a focus on subsistence agriculture activities that are drastically constrained by the lack of access to irrigation water, rural financial services, new technological packages and inputs, and production and business related skills.

75. Around one third of the households are headed by women (680 households) typically as a result of migration of men, leaving women with the double burden of rearing the family and taking responsibility for income generating activities. The youth typically do not possess any

land or other productive assets. Vulnerable households cannot afford to finance professional training or higher education, which constrains opportunities on the labour market to the limited amount of locally available precarious vacancies. Female labour is intensely represented in agriculture with 45% of female employment in the sector (well above 33% of the share of male labour in the sector), making job creation in the agricultural sector an effective way of providing income and jobs for women[14]. Apiculture is seen by young unemployed as a positive economic opportunity what moved them in recent years to demand support to get into that activity[15].

76. Community Leaders from elected community heads and community councils (i.e. local/community self-government bodies) that are formed by citizens through direct and free elections, will be targeted for Component 3, to participate in the development of guidelines and policies, and for the organization of awareness raising and capacity building activities. RA Constitution specifies that local self-government bodies are elected to solve communal problems and to manage the communal property, for a term of three years.

77. Water users' associations (WUA) from the command areas of the irrigation schemes operating in the target municipalities, who are in charge of the operations and maintenance of the irrigation systems and the supply of water to farmers.

78. The typology of the target groups within the target municipalities is as follows:

(i) Small and medium-sized farmers with about 1.4 ha or less of land;

(ii) Farmers' organizations, including WUAs;

(iii) Beekeepers with knowhow but owning either no hives or fewer than 50 hives;

(iv) Landless, young people and women with the qualifications to carry out small projects as SMEs for income-generating and diversification activities.

79. The total number of beneficiaries in the 3 marzes is estimated at about 9,924 direct and indirect beneficiaries (50% women in average).

Gender strategy

80. Following IFAD's policy and Governmental recommendations, the project will pay special attention to enable women to access agriculture production means, and join professional organizations, and especially of the decision-making bodies. Targeting would give specific consideration to vulnerable women-headed households and youth by mobilizing awareness and support activities for these groups to enable them to take advantage of opportunities provided by the Project. This will involve selection of training and other capacity building activities, which specifically benefit and are suited for the needs of the rural women and youth, and will provide preferential access to women and youth for trainings. Furthermore, the IRFSP baseline Project has a significant allocation into water supply for multi-use drinking water and household plots in poor rural areas, which is expected to benefit women the most.

81. In order to strengthen the financial capacity of women and young unemployed, the program will support the development of income-generating activities accompanied by a detailed training programme on institutional development issues, literacy, cooperative management, business skills, etc. Specifically, the project will provide support for the creation of small enterprises or cooperatives to run manufacturing units for fruit tree and vegetable value chains, as well as by-products enhanced by the ecological restoration interventions (e.g. honey and other bee products; fresh/dry wild fruits and berries; dry herbs; essences). According to IFAD's Environment and Natural Resource Management (ENRM) Policy and Environmental and Social Assessment Procedures (SECAP), the Project will apply NRM-focused approaches, by introducing the ecosystem approach to NRM through appropriate methodologies to define and apply sustainable harvesting and conservation criteria for the natural products under use.

[14] WB Data (2011), see Annex 4, Table 4. See also Annex 2 for more on women and youth. See also paras. 31 and 42 on how the Programme links components 1 and 2, and leverages the capacity of women and youth to benefit from the Programme. See also para 90 bullet 4, as well as annex 4 on linkages with other programmes benefiting women in particular. During supervision IFAD staff will maintain a dialogue with development partners on targeting issues as recommended by the QE.

[15] Armenian Honey. USAID & DAI-ASME Project.

Part V – Project Strategy

A. Project Rational

82. Agriculture is a key development sector in Armenia that plays a central role in economic and social terms, and shares a unique place in the country's food security. The lion's share of revenues of the rural population comes from agriculture products and hired labour, hence poverty in rural areas is largely contingent on agriculture development. The Armenia Development Strategy for 2014-2025[16] projects a significant increase of the agriculture GDP from 889.2 billion drams in 2012 to 2,046.8 billion drams in 2025, with an added value of the sector of 3.5- 4 % annually.

83. The governmental projections for 2025 for the agriculture sector may be jeopardized by the combined effect of irrational use of land resources and climate change impacts, which are responsible for desertification processes and various levels of land degradation affecting 80% of agriculture land plots. Climate change projections in Armenia show gradually increasing aridity because of reduced rainfall, higher temperatures and higher evapotranspiration – soil humidity is expected to decrease by 10-30% by 2030. Increased aridity will thus have negative effects on agriculture yields, with a predicted 8-14% decrease for agriculture crops and 7-14 decrease for pastures by 2030. Although irrigated crops yields could increase in spite of climate change, the reduced availability of water could be insufficient to satisfy crop water needs. Higher rates of evapotranspiration will also increase salinization of irrigated farmland that will considerably aggravate the negative impacts of climate change.

Table 2. Major environmental land degradation factors affecting the agriculture sector in Armenia

Factor	Description
Climate Change	• Increased frequency and intensity of drought events combined with intense hot winds (especially in Ararat valley, Syunik, Vayots Dzor, and Vayk). • Increased aridity due to lower rainfall, higher temperatures and evaporation.
Landslide phenomena	• Particularly developed in the zone of medium altitude mountains
Mudflows	• More than half of the Republic's area is mudflow-generating, particularly occurring in the medium-altitude mountain zone.
Floods	• Increase of frequency and intensity of floods due to torrential precipitation regimes and melting, resulting in soil waterlogging. It is widespread in the territory of the Republic, mainly in Ararat and Shirak valleys, as well as in Syunik, Vayots Dzor marzes. • Soil salinization is a direct consequence, especially in the Ararat valley, affecting some 10% of its area.
Soil erosion	• Soil erosion is particularly severe in the meadow and steppe zones where steep slopes are intensively farmed, shelterbelts do not exist, and extensive irrigation is practiced in an unsustainable way.
Soil contamination	• Agricultural production is one of the major factors of environmental pollution. Use of toxic chemicals (herbicides, fungicides, insecticides, seed disinfectants, etc.) and fertilizers in inadequate sizes cause contamination of arable lands.
Uncontrolled grazing	• Bad grazing practices had serious impact on biological diversity, and promoting erosion processes.
Deforestation	• Excessive deforestation for timber (mainly in the 1930-1950s) and energy (since 1991 due to economic and energy crisis), which caused elimination of forest-covered areas by disrupting the ecological balance in the environment. • Loss of ability for natural regeneration, decrease of productivity and biological diversity, activation of erosion, disruption of hy-

[16] RA Government Decree #442-N, on 27 March 2014.

	drological regime.

84. In recent decades, the higher intensity and frequency of extreme hydro-meteorological phenomena in Armenia has exacerbated land degradation problems, such as water and wind erosion, landslides, mudflows, forest fires, and forest and agriculture pests and diseases. The target marzes (Vayots Dzor, Syunik in the south; Ararat in the central-west) are significantly affected by the following extreme weather events: seasonal flooding (mainly in the southern and northern marzes), drought events combined with the drying effect of the southern winds, hailstorms, and early frost, with major impact in the Ararat semi-desert valley. These marzes share a number of anthropogenic problems that make them highly vulnerable to land degradation, of which poor farming practices in too fragmented land plots, deterioration of water resources - including salinization in the Ararat marz - and water erosion due to obsolete irrigation infrastructure and inefficient irrigation, and unsustainable grazing and forest management are to be highlighted. As a result, more than 50% of the territory in the target marzes has eroded soils (except for Lori, with 35% of eroded soils), more than 50% of the territories are prone to mudflows (up to 100% in Vayots Dzor), and significant land surface is affected by landslides (from 144 km in Ararat, up to about 240 km2 in Vayots Dzor, and Syunik).

85. Therefore, major efforts in the modernization and higher efficiency of the agriculture sector will not succeed if land conservation and environmental risk-reduction measures are not well integrated. The GEF project aims to provide such additionality to the baseline IRFSP project that addresses rural poverty alleviation in selected regions of Armenia through: (i) irrigation infrastructure rehabilitation for improved agricultural production; (ii) increased productivity of small scale farming, post production processes and transition by smallholders to growing high value cash crops; (iii) creation of linkages between agro-processing facilities and poor rural smallholders to enhance their improved access to domestic and international markets and employment opportunities along the value chain; and (iv) upgrading food safety, the quality of marketable products, and family health by improving household water supplies.

Table 3. Extreme weather events and land degradation problems in targeted marzes

Marz	Dry con-ditions (0-low, 5-high)	Drought & southern winds (0-low, 5-high)	Seasonal flooding (0-low, 5-high)	Hailstorm (0-low, 5-high)	Early frosts (0-low, 5-high)	Eroded soils (% of the territory)	Land slides (surface km2)	% of marz territory prone to mud-flows
Ararat	4	5	2	4	5	54.3	143.9	49
Vayots Dzor	2	3	4	2	3	61.2	242.4	100
Syunik	1	2	4	2	2	54.6	246.7	70

86. The GEF Project responds to the following governmental priorities addressing land degradation mitigation in agriculture landscapes:

- The adoption of sustainable agriculture management practices, rural income diversification and ecological restoration are seen as a priority in the Armenia Development Strategy (ADS) for 2014-2025.
- The National Plan to Combat Desertification in Armenia (NPCD) (2002) that proposes the following integrated actions to prevent desertification processes: (i) introduction of anti-erosion measures for pasture and hay-field improvement, including grassland restoration, rotation management systems; (ii) introduction of anti-erosion arable land development, including adequate organic fertilization for the different types of soils, crop rotation, rehabilitation of irrigation infrastructure, adjustment of irrigation systems to different crops, soil conservation techniques, and the use of the safest means for plant protection; (iii) forest protective and forest restoration activities; (iv) landslides and flood control protective infrastructures, drainage, etc.
- The *National Forest Policy and Strategy (2004)*[17] *and National Forest Program/NFP (2005),* aiming to restore degraded forest ecosystems (2-2.5 thousand ha of restored forests, 5-5.5 thousand ha of new tree plantations, and 0.6-0.65 ha of protective forest by 2020), their sustainable use and to ensure the provision of environmental services.
- The TNC priorities and the adaptation measures proposed by the WB-funded study on *Reducing the Vulnerability of Armenia's Agriculture Systems to Climate Change* (2014),

[17] ftp://ftp.fao.org/TC/CPF/Countries/Armenia/Armenia%20CPF_FINAL_English.pdf

with special focus on: (i) the promotion of drought-resistant, pest-resistant crop varieties and breeds, with special focus on local varieties; (ii) the rehabilitation and modernization of irrigation schemes, and implementation of efficient irrigation technologies, soil moisture conservation cropping techniques and crop rotation systems; (iii) adopt changes in crop management, crop diversification, the use of heat- and drought-resistant crop varieties, the adoption of mixed farming systems (crop-livestock-tree), and switch from field to tree crop (agroforestry); (iii) ensuring grazing norms for the sustainable use and restoration of pastures; (iv) the restoration of degraded forest ecosystems - reforest 5000 hectares of degraded forest areas and create 600 hectares of agricultural forest protection zone and shelterbelts during the period of 2009-2020; (v) the adoption of integrated pest management measures and integrated fire management strategies in agriculture and forestry; (vi) the restoration of fruit tree orchards and vineyards; (vii) the prevention of landslides and floods through the restoration of vegetation on sensitive slopes and river banks, bio-engineering structures and other reinforcement elements, drainage techniques, automatic flood warning observation points, and modern methods of short-term and long-term forecasting of floods; (ix) the establishment of a system to monitor the application of ecosystem approaches in agro-ecosystem management and restoration at the basin level, and for the introduction of the "optimal afforestation" idea in the National Forest Strategy.

87. The GEFTF project will build institutional and technical capacity, and will provide technical and financial support to the target municipalities, i.e. farmers' associations (including WUAs) women and youth groups for the implementation of SLM measures to support sustainable farming systems and enhance ecosystem services in the target marzes, responding to the above mentioned priorities identified by the Armenian government to combat desertification and land degradation affecting agriculture development.

88. The GEF Project is complementary with the baseline IFAD-supported IRFSP Project, addressing in an integrated way the root causes of agriculture decline and rural poverty in in the targeted marzes. The input of the GEF funding will translate into: (i) more sustainable land management, higher yields and more diversified production through efficient irrigation and sustainable agriculture systems and technologies, better adapted crop types and varieties, and the ecological restoration of functional agro-landscapes in the target areas, preventing land degradation problems; (ii) improved access to suitable technologies and knowhow thanks to the facilitated access to improved services, inputs, and credit for producers, the positive impact of targeted technical and institutional capacity development, and the implementation of on-the ground activities.

B. Approach and consistency with GEFTF requirements

89. The Project was developed in accordance with GEF eligibility criteria and respects the principle of national ownership, having been developed in consultation with national stakeholders, and taking into account all relevant recent studies and reports available on Armenia's desertification, land degradation, and climate change adaptation needs. In addition, the project was designed to fully address the priorities for the agriculture sector identified by the Government in several governmental reports (ADS, NPCD, NFP, TNC) and has been developed in such a way as to ensure sustainability and replicability beyond project completion.

90. The Project is consistent and responds to the GEF Land Degradation Focal Area (LD FA) supporting efforts to combat land and forest degradation in rural production landscapes through sustainable land management (SLM) investments. In line with the LD FA, the Project adopts a landscape approach for natural resource management and vegetative cover restoration in the watersheds where the IRFSP baseline project will support the rehabilitation of irrigation schemes and crop production. The Project also aims to deliver multiple global environmental benefits, particularly in the context of sustaining the flow of ecosystem services, climate-resilient agriculture management systems, integrated water management, and enhancing agro-biodiversity in the productive landscapes. The Project is consistent with the LD FA priorities to enhance food security and ensure gender mainstreaming, recognizing the higher vulnerability of rural women – namely women-headed households – to environmental risks, and the differential adaptation strategies employed by women and men. The project will support enabling conditions that overcome disparities between women and men in the project areas, and point out gender responses that are already emerging at the communities, drawing on existing good practices and examples that could be scaled up and replicated to enable more effective, relevant, equitable and empowering practices.

91. The Project responds to the following LD FA objectives: (i) LD-1 (Maintain and improve flow of agro-ecosystem services to sustain food production and livelihoods), promoting climate-resilient SLM options to reduce soil erosion rates, and improve habitats and agro-biodiversity in the production landscapes; (ii) LD-3 (Reduce pressures on natural resources by managing competing land uses in broader landscapes), through increased investments in integrated watershed management and restoration approaches adopted by water users associations (WUAs), municipalities and local land users, which will also facilitate the achievement of multiple global benefits within the Biodiversity, Climate Change and Sustainable Forest Management focal areas.

C. GEFTF Added Value Compared to the Baseline

92. The GEF project is fully blended with the IRFSP baseline project, in order to integrate soil and water conservation measures in the development of the targeted crops and rangelands, and restore the resilience to land degradation and climate-risks of the agro-ecosystems and the rural population in the project areas.

93. During the six years of implementation (2016-2021), the IRFSP project will cover rural areas in a number of marzes with different agro-climatic zones. Consequently, the investment made by the GEF project will provide additional support to help mainstream measures to combat land degradation and desertification into the IFAD baseline and the contributions to be made by the Government of Armenia and other partners. This will expand the impact of the project and enhance the long-term sustainability of the results. Activities under the GEF Project will be complementary and synergistic to those under IRFSP.

94. IRFSP will focus on: (i) the rehabilitation of tertiary irrigation infrastructure to make irrigation water accessible at the farm level; (ii) the expansion of fruit trees, vineyards and vegetable production at the expense of cereal crops – cereal cultivation in steep slopes is a major cause of land degradation - which represents the value chain with greater potential for agriculture production in the target areas; (ii) the enhanced access to rural finance for local producers and small entrepreneurs to increase their capacity on production, post-harvesting, processing and marketing.

95. The preliminary work on mapping and earth observation has proven to be extremely helpful in identifying the target sites. The GEFTF project will further invest in participatory mapping exercises, following an ecosystem-based approach for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way, to ensure coherent targeting, as well as the development of a monitoring and evaluation system that would facilitate the measurement of project impact.

Table 4. GEFTF Added Value to the Baseline IRFSP

Level	Additional benefits
The overall goal of IRFSP is to improve the economic and social status of the population in selected rural areas where poverty is prevalent by generating income growth and sustainable employment opportunities through strengthening the agriculture production systems and the forward and backward linkages of value chains for cash crops. The specific objectives for rural poverty mitigation are: (i) increased efficiency of high value cash crops value chains; (ii) improving water infrastructures; (iii) upgrading food safety, the quality of marketable products, and family health.	- The GEF interventions will improve resilience of the smallholder farmers' production systems to land degradation and climate-related risks by promoting Efficient Irrigation Technologies (EIT), soil and water conservation (S&WC) farming systems, and ecological restoration measures; - The GEF project will incorporate erosion control measures (e.g. protective vegetation shelterbelts to prevent wind erosion and siltation problems in the irrigation infrastructure) and water efficiency technologies in the rehabilitated tertiary irrigation infrastructure and conveyance networks.
Component 1 of IRFSP would be **Rural Finance,** including credit for farmers and small enterprises to be channelled through the existing Rural Finance Facility (RFF), and equity	- Project beneficiaries will be trained on environmental impacts reduction measures and climate-resilient technologies to be acquired through IRFSP available credits - Financial Institutions selected by IRFSP will integrate the necessary information to evaluate robustness of applications for finance for environmentally sound, economically viable and socially beneficial

and semi equity financing through the Fund for Rural Economic Development in Armenia (FREDA).	investments.
Component 2 of IRFSP would be **Rural Areas Water Infrastructure (RAWI),** mainly irrigation improvement and rural water supplies, designed to improve the economic opportunities and standard of living for small farming families living in poor communities.	- Municipalities with communal lands close to the command areas of the IRFSP rehabilitated irrigation schemes will benefit from grants supporting investments in EIT, CA, OA, IPM systems and technologies. - Technologies are adapted and livelihoods diversified into the most productive and resistant products and value chains. - Service providers selected via tender by the PIU will support farmers and farmers' organizations in the adoption of sustainable farming systems and technologies, and in the implementation of landscape restoration works. - The financial support for agro-forestry planting and ecological restoration investments shall significantly decrease soil erosion rates in farmland/rangelands and in the upstream and downstream neighbouring lands, soil fertility shall significantly improve at a lower production costs leading to higher and more stable crop yields, and water requirements for crops shall be reduced.
Component 3 of IRFSP would cover the **Farmer awareness and Support,** providing technical support, capacity building, and technical studies.	- Project beneficiaries will be trained on the environmental benefits of efficient irrigation, sustainable farming systems and landscape restoration measures. - Information material (i.e. leaflets, handbooks, articles, etc.) showing lessons learned on sustainable farming systems and technologies and landscape restoration prepared and disseminated widely to practitioners and society in general. - Best practices and lessons learned will be reflected in IFAD's country programme and will contribute to policy dialogue. - Creation of an effective reporting system on monitoring findings.
Component 4 of IRFSP would finance **Programme Management**.	- The GEFTF project will help integrate combating land degradation and climate-risk aspects in the overall IRFSP project management and monitoring. - The GEFTF project will cover the costs for a GEFTF Project Coordinator that will ensure the overall coordination, management and implementation of the GEFTF activities and effective integration in the IRFSP baseline. - National and international experts will be hired to provide technical support and guidance for the effective implementation of the different project components, and help fully integrate sustainable land management, ecological restoration and climate-risk reduction issues in the baseline interventions and M&E system.

D. Country eligibility, ownership and driveness

Country eligibility

96. Armenia ratified the UN Convention on Combating Desertification (UNCCD) in 1997, the Convention on Biological Diversity (CBD) in 1994, and the UN Framework Convention on Climate Change (UNFCCC) in 1993, and the Kyoto Protocol (2003). Other Global Environmental Conventions signed by the Armenian Government are: the Stockholm convention on Persistent Organic Pollutants (2001), the Aarhus Convention, ratified in 2001, the Convention on Long-range Trans-boundary Air Pollution, the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, and the Convention on Environmental Impact Assessment in a Trans-boundary Context.

97. Compliant with the UNCCD goal to combat desertification and mitigate the drought impacts, thus contributing to the increase of soil fertility, as well as restoration, protection and sustainable use of land and water resources, Armenia has assumed the following responsibilities: (i) Organizing the process of combating desertification through complex approaches, considering combating desertification, as well as mitigation of drought effects as priority issues; (ii) Integrating poverty reduction oriented strategies; (iii) Supporting the collaboration with environmental, particularly land and water resources protection, sectors; (iv) Promoting and strengthening sub-regional, regional and international cooperation; (v) Developing strategies and approving priorities in the framework of sustainable development projects □and strategies; (vi) Discussing issues on eradication of desertification originating causes and paying a special attention □to socio-economic factors contributing to combating desertification; (vii) Promoting public awareness increase, as well as public (especially women and children) participation in procedures focused on combating desertification,

through non governmental organizations; (viii) Establishing a favourable environment through developing new laws and long term policy and an action plan.

98. According to the Government, Economic and financial mechanisms for implementation of UNFCCC, UNCBD and UNCCD should have a synergistic effect, since the above-mentioned conventions are interrelated in a number of fields and in many cases they supplement each other. To ensure the reduction of negative environmental impact, and sustainable and efficient use of natural resources, as well as fulfilling environmental inputs, replenishing the state budget and ensuring financial resources generation, a certain system of economic and financials mechanisms has been introduced thanks to the adoption of RA Law on Nature Protection and Nature Use Fees and sub-legislative acts regulating the implementation of the Law, which bases on nature protection and nature use fees. Thanks to this system state budget income has sufficiently increased.

Country driveness

99. Launched in 2004, the National Capacity Self-Assessment (NCSA) Project was aimed to identify national priorities and needs in terms of capacity enhancement in the area of Global Environment, notably, in what concerns Biodiversity, Climate Change, and Desertification Control for the purpose of catalysing sustained actions both at the national and local levels. Throughout its duration, the NCSA project in Armenia has ensured a highly participatory process. The main outputs of the NCSA process are an action plan and a number of thematic reports related to the different conventions.

100. The NCSA project takes into consideration the Convention Provisions, as well as cross cutting issues on UNCCD, CBD and UNFCCC. A large number of projects on environmental issues and the rational use of natural resources have been developed in recent years in Armenia, with financial support of international organizations and donor countries (e.g. Armenia's Irrigation System Development Programme 2001-2007; Programme for Priority Anti-Landslide Measures in Armenia 2001-2005; Armenia's Sustainable Agriculture Development Strategy 2004; the National Forest Policy and Strategy, 2004). Integration of planning within the framework of conventions and national programmes and plans increases the effectiveness of the planning system.

Table 5. Links between the Rio Conventions (National Capacity Self-Assessment/NCAS for Global Environmental Management, 2004)

Convention	Activity, related to implementation of conventions	Link with conventions
Convention on Biodiversity	• Restoration and sustainable use of forest resources • Restoration and sustainable use of natural grazing lands • Protection of natural landscapes and ecosystems • Protection of water ecosystems, including Lake Sevan ecosystem • Expansion of protected areas, creation of buffer zones and ecological corridors, paths for animal migration • Reduction of anthropogenic impact on the environment	FCCC, CCD FCCC, CCD FCCC, CCD FCCC, CCDCCD
Convention to Combat Desertification	• Expansion of irrigated land areas • Amelioration of agricultural lands and protection of areas from external processes • Restoration and sustainable use of forest resources • Optimization of spatial planning in marzes and communities	CBD, FCCC CBD, FCCC FCCC, CCD CBD, FCCC
Convention on Climate Change*	• Economical and rational use of water • Supplement Lake Sevan water reserves • Increase volumes of accumulation of river flows • Use of modern water-saving technologies • Optimization of land use, amelioration of agricultural lands • Use of technologies which maintain humidity in soil • Restoration and sustainable use of forests, expansion of forest covered areas • Protection of natural ecosystems, including water ecosystems	CCD CCD, CBD CCD CCD CCD, CBD CCD CBD, CCD CBD, CCD

E. Project objectives and components

101. The **overall objective** of the GEF project is "*to enhance the overall resilience of rural communities living in risk-prone areas of Armenia".*

102. The **specific objective** of the GEF project is "*to increase income and assets generated by smallholder farmers through investments in sustainable land management systems and technologies*".

103. **Component 1 – Investments in sustainable farming systems benefiting from rehabilitated irrigation infrastructure (GEFTF Contribution: USD 1,600,000)**

104. This component aims to support investments in sustainable farming approaches in line with the priorities of the Armenian government to mitigate land degradation and the impact of climate-risks to agriculture development. The introduction of suitable agronomic systems for fruit tree production and crop diversification will help compensate the predicted increase of water deficit and evaporation due to CC predictions, favouring better soil moisture storage and retention capacity, and optimal use of irrigation water, while ensuring a more stable and improved production, and preventing environmental problems such as soil erosion and salinization.

105. The GEFTF will be complementary to IRFSP's efforts on the rehabilitation of tertiary irrigation distribution networks to enhance water distribution to upgrade productivity of irrigated smallholder plots and expand irrigated areas. The Project will support the assessment and identification of the most suitable high value fruit tree cultivars for erosion prevention and improvement of marginal communal lands exposed to land degradation and climate risks in the target municipalities, and will demonstrate best practices in agro-forestry planting and management in about 800 ha within the target municipalities. Moreover, the Project will provide start-up packages to support diversification in private farmland plots, as an effective instrument to combat poverty and economic marginality of women-headed households. These packages will include, but not be limited to: green houses, efficient irrigation systems, as well as other investments that will be assessed based on selection criteria (see Outcome 1.2).

106. The GEF will benefit from the governmental policy reforms on land tenure, and the governmental innovative Fund (RFF) supported by the IRFSP baseline, to be channelled to smallholders and SMEs working to improve and intensify their production operations and to increase their incomes in various value chains, with a special focus on fruit trees.

107. The optimization of the agronomic systems benefiting irrigation water from the rehabilitated tertiary infrastructure, will be based on a series of criteria such as: (i) cost-benefit ratio in terms of production quality and quantity, and increased incomes of beneficiary households by 20-30 %; (ii) reduction in water requirements for crops; (iii) reduction in the cost of inputs and the cost of energy, water, transportation, plant health products; (v) reduction in soil erosion; (vi) improvements in the soil water holding capacity; (vii) improvements in soil organic matter content; (viii) improvements in water quality due to lower use of chemical fertilizers and pesticides, etc.

108. ***Outcome 1.1 Investments in sustainable fruit tree farming systems for increased productivity in communal marginal lands (GEFTF: USD 1,000,000)***

109. There is a long tradition in fruit tree cultivation in the target marzes, whose surface was considerably diminished due to land abandonment after the collapse of the Soviet period and the conversion into cereal production of agriculture lands not suitable for this type of annual crops. Suitable agro-forestry[18] fruit tree systems are well adapted to local conditions - slopes, altitude and type of soil - and in some cases are highly resistant to water scarcity, such as almond. The resulting products are easy to store and not immediately perishable, in the form of raw products in the case of dried fruits, and in the form of processed by-products and derivatives.

110. As identified during appraisal, and based on farmer interviews, there is potential demand in the target municipalities for producing a number of high value fruits - peaches, apricot, plums, cherries, apples, pears, walnuts, almonds and pomegranate – and vineyards. The GEFTF project will support the target municipalities with funding of about USD 1,000/ha for

[18] Agroforestry is a major SLM strategy for soil erosion control and land degradation mitigation, and one of the best "no-regrets" measures in making rural communities adapt and become resilient to the impacts of climate change identified by the IPCC, the UNCCD and the National Plan to Combat Desertification in Armenia. It also creates opportunities for diversification of the agriculture systems – intercropping, honey production, bio-energy production from tree pruning waste, and livestock integration in agriculture – by reducing the mono-cropping dependence risk, and exploiting new market opportunities and existing market niches. Agroforestry benefits include: (i) changes in the microclimate moderating the effects of solar radiation, high/low temperatures, wind, and heavy precipitation on the soil and the plant evapotranspiration; (ii) protection and soil erosion prevention through the provision of permanent cover and root system; (iii) improved soil fertility through the maintenance of the soil organic layer and its physical properties and aeration, the extraction of nutrients from deep soil horizons, and the promotion of more closed nutrient cycling; (iv) increased soil water infiltration and hydrological regulation; (v) increased soil and vegetation carbon sequestration and reduced carbon emissions.

the conversion of degraded marginal communal land into sustainably managed fruit tree plantations, with the objective to regain healthy soil conditions and productivity in about 750 ha (50% of the lands suffering degradation problems in the target municipalities). Municipalities will provide in-kind contribution, in the form of labour for the planting operations.

111. It is essential that fruit tree planting and management interventions are planned and implemented according to the environmental – soil and climate features, land conservation status, and climate-risks - and socio-economic context of each territory. The PIU will hire a service provider among those national NGOs and other service providers with demonstrated solid experience on agro-forestry and soil and water conservation agronomic systems and technologies in Armenia, following the procurement procedures established in the IRFSP baseline project. An international expert, with solid demonstrated background on soil and water conservation agronomic systems and technologies applicable to agro-forestry systems - such as drip irrigation[19], conservation agriculture[20] (CA) and organic agriculture[21] (OA) - will also be hired, to support the project coordinator, in a short-term basis of about 20 days/yr – following similar procurement procedures established by IRFSP project – to identify and assess best practices from Armenia and elsewhere applicable to the project context, and support the PIU and service provider in decision-making, training and monitoring actions.

112. The international expert and the service provider will support local beneficiaries in a community resource GIS mapping exercise, which will be an integral part of the baseline study. This participatory exercise will help identify vulnerable sites and the root-causes of land degradation, understand local perceptions and coping strategies to environmental-risks, select climate-adapted agro-forestry species and varieties favouring soil conservation, and identify the multiple benefits for the target communities that an ecosystem-based approach to climate adaptation in rural development can provide. The mapping exercise will help select candidate sites for rehabilitating agro-forestry crops within communal land plots formerly dedicated to agriculture or pasture that are not any longer viable for production because of clear and evident degradation problems. This will help prevent the conversion of natural ecosystems into agriculture land through the GEFTF investments.

113. Agro-forestry fruit tree plantations in degraded communal land will take place in the municipalities of Vayots Dzor and Syunik, and at a lower scale in only two target municipalities of Ararat marz (Nor Ughi and Surenavan). Pokr Vedi and Shahumanyan municipalities will not receive grants for plantations due to the complexity of addressing salinity problems without harming adversely affecting the nearby Ramsar site. The target municipalities will receive a maximum of USD 125,000 for the fruit tree planting and management operations that will need to follow SLM guidelines. The hired service providers will provide the municipalities with the necessary technical support to develop agro-forestry plans to guide the soil preparation, planting, management and maintenance operations in the eligible marginal lands. The provision of sustainable fruit tree planting and management plans will be conditional for accessing grant funding. Service providers will also provide regular support to the land preparation, planting, management and maintenance works, as a way to ensure effective implementation throughout the process, and provide "learning-by-doing" know-how to the project beneficiaries through project Outcome 3.1.

[19] Drip irrigation is an efficient irrigation technology that also has a demonstrated effect in the washing down of salt from soils, and is appropriate in areas where soils with saline and alkali content coexist with over-irrigation (e.g. improper use of flood irrigation), which is the case of many areas in the targeted marzes in the Ararat valley.

[20] Conservation agriculture (CA) systems have a higher adaptability to climate change because of: (i) a more effective water infiltration and greater soil moisture-holding capacity, that help minimise the impact of extreme weather events such as water stress during drought, and run off erosion and flooding during torrential rain events; (ii) the reduction of surface soil extreme temperatures and fluctuations help minimise the effect of heat weaves and frost periods; (iii) the higher soil resilience increase productivity and crop diversification, with a positive effect on food security; (iv) the reduced use of fossil fuel and the increase of soil carbon has an important mitigation effect.

[21] In Armenia the demand from processing companies for organic raw materials is the main factor for the development of organic agriculture. In 2009, there were 1'100 hectares of certified areas, 600 hectares were agricultural land, and 500 ha for wild collection and areas under conversion. The production of fruits, berries, alfalfa, some grains, vegetables, and collection of wild species as well as beekeeping (there are about 1'000 beehives producing organic products) are the main organic agricultural activities. The main exported organic products are fruit and berries from production and wild collection in the form of frozen juices, beverages, fruits and syrup to Russia and European Union markets.

114. The target municipalities will recommend to farmers benefiting from the leasing arrangements for the new fruit tree communal land plots to apply sustainable agronomic systems and practices, such as drip irrigation, conservation agriculture (CA) and organic agriculture (OA), featured in the GEF/UNEP Guidebook for CC Adaptation in Agriculture, and in the governmental documents addressing land degradation (NPCD) and CC adaptation (TNC) in the agriculture sector. Lessee farmers may benefit from rural finance opportunities (e.g. obtaining credits for the acquisition of equipment for drip irrigation or other sustainable farming technologies) provided by the IRFSP baseline project.

115. For the effective implementation of Outcome 1.1, the PIU will seek collaboration with seed research centres under the ANAU and MoA, and the Institute of Botany with a important collection of seeds from the numerous Armenian wild pear species and other wild relatives, *MNP and other nursery organizations*, the Gene Banks under the ANAU and MoA, the Laboratory of Plants Gene Pool and Breeding of the ANAU, and the Scientific Centre of Viticulture and Fruit-growing of the MoA, among others.

116. Under Outcome 3.1, the Project will raise awareness and build the capacity of local stakeholders about the benefits of adopting adaptive farming systems and technologies (e.g. combining drip irrigation, CA and OA principles to minimize the environmental risks and the negative effects of agrochemicals). For instance, there are several factors that encourage organic production in Armenia: (i) Armenian farmers have been using very low quantities of different chemical inputs, fertilizers, and plant protection means during the last decade[22]; (ii) currently there are many local and international organizations stimulating the organic farming in Armenia (e.g. organizations like GREEN LANE NGO, SHEN NGO, ECOGLOBE, USDA, DAI-ASME, GTZ, FAO, and the Ministry of Agriculture are studying the potential of organic agriculture in Armenia.

117. The GEFTF project will test and demonstrate how to convert marginal agriculture communal land into suitable fruit tree systems to help raise the interest of local stakeholders in the target municipalities and beyond for investing in similar land degradation and climate-risk mitigation options.

118. The Project will build on the lessons learned from pilot projects implemented in Armenia and neighbouring countries, which have yielded successful results. The following experiences are particularly interesting for upscaling and replication:

- The Water to Market activity of the Millennium Challenge-Armenia Project, in which non-traditional vegetables with high nutrient and medicinal values have begun to play a definite role in the overall assortment of vegetables, which already enjoy demand in the consumer market, both fresh and processed;
- The WB Armenia Irrigation System Enhancement Project (2013-2017) aiming to reduce the amount of energy used to improve irrigation conveyance efficiency in targeted irrigation schemes, and improve the availability and reliability of important sector data and information for decision makers and other stakeholders;
- The WB Community Agriculture Resource Management and Competitiveness Project in Armenia (CARMAC I and II) (2011-2020) aiming to improve the productivity and sustainability of the pasture/livestock livelihood systems in selected communities, and increase the marketed production from selected livestock and high-value agri-food value chains;
- The UNEP GEF project "Enhancing Livelihoods in Rural Communities through Mainstreaming and Strengthening Agricultural Biodiversity Conservation and Utilization", that supports adaptation to environmental and agricultural challenges, including markets, in the country and provides a sustainable basis for enhanced utilization to improve rural livelihoods
- The EU-funded project "Sustainable Land Management for Mitigating Land Degradation an Reducing Poverty in the South Caucasus Region";
- The project Development of Biological Agriculture and Bio Certification in South Caucasus supported by SDC[23] and HEKS[24] (2002-2010) with technical assistance provided by GIZ.

119. ***Outcome 1.2 Efficient land and water management practices for crop diversification and food security adopted by women groups (GEFTF: USD 600,000)***

[22] According to the Ministry of Agriculture (2004) the volume of N- fertilizer consumed in Armenia went down from 25,000 tons in 1992 to as low as 5,000 in 2001. In the last decade, the use of mineral fertilizers was reduced by 10 times, and plant protection means – by 10 times.

[23] Swiss Agency for Development and Cooperation.

[24] Aid organization of the Protestant Churches of Switzerland.

120. Taking into account that in Armenia a large number of households/farms in agricultural sector are led/managed by women and such households are tend to increase due to men continue leaving for better income, this Outcome will preferably focus on supporting women-headed households.

121. It is largely by diversifying high value vegetable crops thanks to the on-farm provision of irrigation water that women-headed households can become more resilient, prevent land degradation and reduce the climate-risk that affect both people's life and assets. The possible benefits and impact of diversification are many: (i) distributing risks, both climate-related and others, among different crops; (ii) extending vegetable production from early spring to late autumn, leading to increased production volumes and increased incomes; (iii) developing competencies around production, processing and marketing; and (iv) achieving a broader range of products that better reflect the productive potential of the mountain regions targeted by the project. Besides being an effective instrument for mitigating land degradation and climate risks on vulnerable territories, this Outcome lays the groundwork to increase nutrition security, and combat poverty and economic marginality of vulnerable population with a focus to women-headed households, which represent one third of total households in the target areas.

122. The GEFTF project will provide start-up packages (20% contribution from grant beneficiaries) of about USD 3,000 each targeting women groups willing to diversify crop production in their farmland plots, making use of sustainable farming technologies, in line with the priorities of the Armenian government to mitigate land degradation and the impact of climate-risks to agriculture development. Priority will be given to those who owns land in unfavourable positions, far from irrigation networks and where degradation is higher. As part of the participatory analysis described in Outcome 1.1, the PIU will make a diagnosis of suitable sustainable farming systems and production opportunities addressing the food security and income generating needs of women groups in the target areas. Grant funding will cover start-up packages including, for example, soil analysis, land preparation, efficient irrigation and other farming equipment, plant material, etc. The PIU will define selection criteria as part of the Project Implementation Manual, addressing: (i) household selection criteria such as willingness to belong to an interest/women's group if not already a member, interest in participating in SLM and climate-resilient farming activities, willingness to bring a financial or in kind contribution, readiness to attend training activities, etc; (ii) checklist for expenditures eligibility, in line with the Governmental priorities and experts' assessment about SLM and climate-resilient farming systems suitable for the environmental and social conditions of the target areas.

123. The PIU will in consultation with IFAD developed selection criteria and hire a service provider among those national NGOs and other service providers with demonstrated solid experience on supporting rural women groups in Armenia, following the procurement procedures established in the IRFSP baseline project. The service provider will support grant beneficiaries in the acquisition of the necessary institutional development and technical skills (Outcome 3.1), the installation of the equipment, the selection of suitable high value horticulture crops (e.g. tomato, eggplant, capsicum, radish, cucumber, radish, cabbage, onion, spinach, bean, pepper and berries), and the effective implementation of the agriculture production activities, according to the environmental-risk reduction objectives of the GEFTF project.

124. The PIU will organize an intense process of open community mobilisation meetings, raising awareness about land degradation, climate-risks, SLM and crop diversification among vulnerable women in the target municipalities. The project will promote a self-selection of interested and motivated women farmers, willing to apply to the grant scheme. It is expected that the project will support about one third of the women-headed households (between 200-240) with the available small grant funding. Under the Outcome 3.1 the targeted women groups will receive further training on key production, processing and marketing issues to increase their capacity to produce high quality and less perishable products and market them.

125. The project will test and demonstrate good opportunities for SLM and crop diversification supporting women-headed households, to help raise the interest of local stakeholders in the target municipalities and beyond for investing in similar land degradation and climate-risk mitigation options. Other women willing to embark in similar activities may benefit from the IRFSP rural finance opportunities to obtain credits for the acquisition of similar start-up packages.

126. The Project will build on the lessons learned from pilot projects implemented in Armenia by organizations like OXFAM, UMCOR[25], WECF[26] France (e.g. the AWHHE[27] project supporting Armenian women to participate more in sustainable rural development), among others, which have yielded successful results in the target marzes and elsewhere in the country. The Asian Development Bank is developing the Women's Entrepreneurship Support Sector Development Programme (2013-2017) providing USD 40.6 million to banks and one MFI to support the investments of the SMEs that are operated by Armenian women. Although this Programme has no particular rural focus, part of the invested funds will surely be allocated to agriculture SMEs. A close liaison between IRFSP/GEFTF will be considered to coordinate activities and lever support for the women entrepreneurship efforts of the IRFSP/GEFTF and training activities (Outcome 3.1).

127. **Component 2 – Community-led land degradation prevention through landscape restoration interventions (GEFTF Contribution: USD 1,800,000)**

128. Activities planned under this component will enable beneficiaries to deal directly with ecosystem-based approaches for land degradation reduction in the target areas by restoring the ecological integrity and the overall quality of the natural capital (e.g. soil fertility, soil organic matter, soil water content, pollination services, healthy natural vegetation cover) of forests and pastures so as to enhance ecosystem services supporting agriculture production in the target agro-landscapes, and to diversify income opportunities based on the by-products enhanced by the restoration interventions (e.g. improved vegetation with higher melliflora diversity for beekeeping; planting of multipurpose plant species with economic value for edible and medicinal uses).

129. The natural vegetation of the slopes, ravines and riverbanks in the target areas is exposed to a high risk of erosion as a result of overgrazing, uncontrolled harvesting of forest resources and deforestation, and conversion into agriculture of unsuitable lands. Climate change impacts will further reduce the capacity of the natural ecosystems to face the combined effect of human and environmental risks, and to main the ecosystem services needed to support sustainable agriculture production. Through this component, the GEFTF project will strengthen the capacity and participation of local institutions and communities in landscape restoration actions that: (i) have a positive impact on the whole landscape and broader range of land uses, not just the individual sites; (ii) provide balanced environmental, social, and economic benefits that best meets social demands and environmental needs; (iv) demonstrate a model for the sustainable use and economic benefit of restored vegetated lands that is suitable to the local context and needs.

130. ***Outcome 2.1* – Ecosystem services supporting agriculture production are restored in the target areas *(GEF: USD 1,300,000)***

131. The restoration of the landscape vegetation cover contributes to a higher climate resilience of rural communities, farmland and agro-landscape ecosystems. The restoration of degraded vegetation (e.g. pastures, forest and shrub) both in mountain slopes and riverbanks, and vegetation shelterbelts along irrigation channels and in between farmland plots, increases key environmental services for agriculture production, including water regulation, pollination, soil improvement, carbon sequestration and erosion risk reduction. The restoration of vegetation shelterbelts along the boundaries of farmland plots and irrigation channels creates a favourable microclimate for crops, increases soil fertility and water infiltration, prevents the negative effects of strong winds (e.g. higher evapotranspiration and wind erosion, water evaporation and mobilization of soil particles), and reduces runoff erosion risk. Moreover, the restoration of vegetation shelterbelts has a positive effect on micro-pressurized irrigation, reducing evaporation caused by heat and the wind.

132. In the first months of the project, the PIU, with the support of international and national experts, will undertake an assessment of successful landscape restoration experiences from Armenia and neighbouring countries, identifying approaches methodologies and tools applicable to the bioclimatic conditions of the target areas. The assessment will address all the technical, institutional, policy/legislation and socio-economic aspects that contribute to successful landscape restoration actions. It will include a comprehensive review of ecological and technical considerations for the production of high quality seeds and seedlings from a wide range of native species, effective soil preparation and planting techniques in field

[25] United Methodists Committee on Relief.

[26] Women in Europe for a Common Future.

[27] Armenian Women for Heath and Healthy Environment.

restoration work, as well as a review of bioengineering[28] methods for stream bank stabilization and land erosion control. The direct and indirect economic benefits of ecological restoration will be identified and demonstrated with concrete examples that are relevant to the Armenian context. Case studies from Armenia and abroad highlighting best practices will be prepared.

133. Under the participatory GIS mapping exercise described in Outcome 1.1, vulnerable natural sites, affected by land degradation and posing problems to the provision of ecosystem services supporting agriculture production and natural resource management in the rural landscapes of the target municipalities, will be identified and mapped. The participatory mapping exercise will be followed by a multi-stakeholder consultation, involving project beneficiaries (e.g. municipalities, water users' associations/WUAs, individual farmers and farmers' organizations), and experts from service providers and research institutions. The consultation process will take place in the whole territory of the target municipalities – the landscape context - resulting in the identification of where and how restoration actions should be implemented, the analysis of the restoration feasibility, the selection of the plant species to be part of the restoration works, the restoration methods, and the monitoring and evaluation system. A cost-benefit analysis should be performed by assessing both the costs and benefits of landscape restoration to the environment and to local people. Such cost-benefit analysis should inform the selection of the restoration actions undertaken on particular sites. An adaptive management approach will be applied through the iterative relationship between restoration implementation and monitoring and evaluation.

134. The GEFTF project will provide financial support to corresponding organizations to be identified through tender for the target municipalities that are in charge or specialized in irrigation systems in the target areas for the implementation and maintenance of the restoration works. The restoration interventions related to the irrigation schemes will be planned in a synergetic way together with the IRFSP PIU, hired engineers and WUAs and/or specialized organizations involved in the rehabilitation and modernization of the tertiary irrigation infrastructure, in order to identify the most suitable climate-proof options and the additional ecological restoration measures in micro-catchment areas, river banks and along canals, needed to ensure the good performance and durability of the schemes.

135. It is estimated that about 880 ha will be restored in the target municipalities in total. The Project will provide an average of USD 1,250 per ha of restored land that will be matched by the municipalities and WUAs to cover labour costs. It is estimated an average of 160 ha restored in each of the 5 target municipalities from Syunik and Vayots Dzor, and 80 ha in two municipalities (Nor Ughi and Surenavan) from Ararat marz. Grant funding will cover packages including the necessary seedlings and seeds and the land preparation equipment and inputs.

136. The provision of support will be conditional to the preparation of restoration plans by the municipalities and WUAs, following the criteria specified in the project implementation manual (PIM). Each restoration plan must have its own techno-feasibility studies and/ or cost-benefit analysis, as necessary. They must have clearly defined objectives, expected results, activities, costs and timeline to be defined with all concerned stakeholders. All restoration activities have to pass environmental expertise from the state authorised body. The landscape restoration plan in each municipality will be developed according to the following steps:

1) Acquisition of high quality seeds, cuttings and seedlings hardened enough to stand the stressing field conditions during the first year after being transplanted.
1) Soil preparation will be carried out during late summer/early autumn (i.e. 40x40x40 cm hole opening in restoration sites; ploughing followed by smoothening in the case of seed sowing in degraded pastures).
2) Seedling planting will be conducted just after the first rains have moistened the first 20 cm of the soil and before winter become too cold. Micro-catchments for water harvesting and stones to prevent soil evaporation and weed competition will be established as part of the planting works.

[28] Biotechnical engineering techniques rely on biological knowledge to build geotechnical and hydraulic structures and to secure unstable slopes and banks. Whole plants or their parts are used as construction materials to secure unstable sites, in combination with other construction material (e.g. stones, wood). Thus, biotechnical engineering does not replace traditional hydraulic or geotechnical engineering (e.g. geo-textiles, or concrete blocks), but complements and improves other technical engineering methods.

3) Planting density will be define depending on the site conditions, and a mixture of different plant species, well adapted to local conditions and providing different ecological and socio-economic benefits, will be used in each restoration site. Species such as native oaks (e.g. *Quercus macranthera, Q. iberica*) and *Rosaceae* trees and shrubs (e.g. *Sorbus spp, Pyrus spp, Malus spp, Prunus spp, Hippophae rhamnoides*) will play a major role as plant species attracting seed-dispersal fauna (enhancing natural regeneration) and as re-sprouting species regenerating after fire. Legume shrubs will also play an important role in soil fertility improvement as nitrogen-fixing species. Other species, such as Juniper trees and shrubs and cushion shrubs, will play a major role as facilitators or nurse-species creating favourable conditions for the germination and growth of other plants species, and the restored seedlings. All flowering plant species - such as those belonging to the *Rosaceae, Fabaceae, Labiatae*, and *Asteraceae* – used in restoration actions will increase the abundance of melliflora for beekeeping and honey production, therefore increasing rural income and benefiting rural communities in the target areas.

4) Further management/maintenance: the restored sites will be managed through replanting to replace dead seedlings, weeding, fertilizing and other interventions depending on the site. The temporary enclosure of restored sites or the use of individual tube protectors will be recommended in those sites where uncontrolled livestock grazing or the abundant presence of rodents may be a serious risk for the survival of seedlings. Especially in the case of degraded pasture restoration, mowing will take place in late spring to control the spreading of weeds that may have invaded them. However, weed cover has a beneficial microclimate effect (more humidity and protection from the sun) in the first steps of development of the sown grasses, before mowing takes place.

5) Monitoring: a monitoring system will be established to periodically measure survival rate, the growth of seedlings (e.g. height, stem base diameter, re-sprouting), the vegetation cover, etc. Monitoring will facilitate adaptive management decisions to better adjust interventions according to chaining environmental conditions and unforeseen events, and fine-tune the landscape restoration methodologies to the local contexts.

137. In the case of landscape restoration interventions supporting the functioning and durability of the restored irrigation infrastructure, the restoration plan will add specific justification and description of the type of bioengineering interventions needed to stop and reverse erosion problems in specific sites up-stream and along the schemes. The cost of materials can vary between USD 20-100/m2 (e.g. fascines, and branch cuttings installed to create structural stream bank protection and vegetative stabilization; fiber rolls for stream bank stabilization and protecting slopes from shallow slides while trapping sediment that encourages plant growth; flexible gabions to slow the velocity of concentrated runoff or to stabilize slopes with seepage problems and/or non-cohesive soils)

138. The PIU will hire a service provider among those national NGOs and others with demonstrated solid experience on forest landscape restoration in Armenia, following the procurement procedures established in the IRFSP baseline project. The service provider will support municipalities and WUAs throughout the landscape restoration planning, implementation and monitoring actions through guidance in the writing of documents, field assessments, training, technical inputs, and periodical visits to the target areas to supervise field interventions and monitor results and impact. An international expert with solid demonstrated background on forest landscape restoration will also be hired in a short-term basis of about 40 days/yr during the first 3 years of the project – following similar procurement procedures established by IRFSP project – to identify and assess best practices from Armenia and elsewhere applicable to the project context, and support the PIU and service provider in decision-making, training and monitoring actions.

139. The Project will build on the lessons learned from previous experiences on ecological restoration in Armenia and neighbouring countries, such as the WWF Landscape Restoration Initiative implemented in the Southern Caucasus countries (with pilot actions in Armenia), the *Armenian Tree Project* (ATP) actions, The Armenian Forests NGO planting operations, the UNDP/GEF project on forest rehabilitation to enhance resilience to climate change, among others.

140. **Outcome 2.2 – Complementary value chain of high quality by-products resulting from landscape restoration developed by farmers' groups (GEF: USD 500,000)**

141. Livelihood diversity is an essential prerequisite for reducing risk, building resilience and providing food security. The restoration of the ecosystem services held in Outcome 2.1 will increase the provision of ecosystem services supporting agriculture development and allowing vulnerable farmer groups to diversify their income streams. The aim of this Outcome is to test pathways to demonstrate the economic potential of provisioning ecosystem services, such as honey, wild fruits and medicinal/aromatic plants, that are currently marginal and underdeveloped. The project intends to provide vulnerable beneficiaries - mainly young unemployed and women population in the target municipalities - with the necessary knowhow about the economic opportunities resulting from the landscape restoration actions implemented by the municipalities in the communal lands - e.g. beekeeping, the harvesting and marketing of wild fruits and herbs. Municipalities will promote the establishment or strengthening of local producers associations or cooperatives to develop economic activities such as beekeeping in/around the restored lands, making use of modern production techniques for high quality products and derivatives (e.g. bee-derived products, dried or fresh herbs and fruits) that can be positioned well on the market and also be beneficial in combating land degradation and climate risks.

142. The knowhow around the production, harvesting and sustainable use of ecosystem goods such as honey, edible, medicinal and aromatic plants (EMAP), represents an invaluable asset that is presently underdeveloped[29] in Armenia. For instance:

a) The honey production sector significantly declined with the dissolution of the collective bee farms from the Soviet period; nowadays, although producing good quality honey at a relatively low cost, beekeepers suffer from geographic and economic isolation that prevents a rebound in production and marketing. According to a USAID/DAI-ASME[30] survey in 2007, beekeeping remains a cottage industry in Armenia, with an average of 50 hives per beekeeper, yielding in average 15 kg/hive/yr (ranging from 5 kg up to 30 kg). Poly-floral honey is produced rather than mono-floral one, based on transhumant movements 1-2 times a year following blooming seasons in altitudinal gradients. Honey is sold privately to neighbours at a price ranging from USD 4-6 per kg, and surplus honey is taken to Yerevan for selling through family networks. There is no organized wholesale honey market and a fragmented retail market.
b) The strategic importance of EMAP-based agriculture and linked natural products' industries in Armenia has been underlined by a number of recent surveys. Berry orchards have grown at 12% annually between 2005 and 2012 trigger mainly by interest from food processing companies; according to the National Statistic Service, 616 tons of wild fruits and berries were collected in 2012; however, farmers still fail to meet demand and berry cultivation is still at infancy stage. Fresh and processed berry demand is growing in international markets – berries being the fastest growing export product - as consumers show significant interest towards healthy, niche products increases.
c) In 2009, there were 1'100 hectares of certified areas in Armenia, from which 500 ha for wild collection of fruits, berries, medicinal/aromatic plants and honey (there are about 1'000 beehives producing organic products), and areas under conversion. The main exported organic products are fruit and berries from production and wild collection in the form of frozen juices, beverages, fruits and syrup to Russia and European Union markets[31]. There are over 3,000 ha under the native fruit shrub sea-buckthorn (*Hippophae rhamnoides*) in Armenia. Harvest varies between 0.5 and 2 t/ha, although selected varieties and good agronomic technologies can increase yields to 5-10 t/ha. Sea-buckthorn fruit contains large quantities of biologically active substances (e.g. medicinal oil, vitamin C, organic acids) making it irreplaceable as a raw material for the pharmaceutical and food industries (e.g. oil and alcohol-free beverages). As a forest planting species, it possesses many valuable traits: it is one of the best fast-growing species for soil erosion control in degraded lands and ravines.

143. This Outcome will specially promote beekeeping (although not exclusively, depending on the interest from local beneficiaries about the production and marketing of wild products), which represents one of the wild production sectors with higher potential in the target areas – specially in the forest marz of Syunik, and the mountain steppe marz of Vayots Dzor - in

[29] Hamimaz R. 2009

[30] Development Alternatives Incorporated - Armenian SME Development Project.

[31] Urutyan, V (2007) Market assessment and development for organic grown produce in Armenia. 106th seminar of the EAAE; Darbinyan, N. (2011) Organic agricultura in Armenia. In: Willer, H & Kilcher, L. (Eds) (2011): The world of organic agricultura. Statistics and emerging trends. IFOAM.

terms of income generation and marketing, and most sensitive to global changes, both anthropogenic (e.g. the increased use of pesticides and herbicides in agriculture) and climate change (e.g. changes to habitats and to behaviour of bees leading to declining numbers). Product quality and quantity are closely linked to the health of the ecosystem in which bees and beekeepers operate. On one hand, the crosscutting interests of beekeepers, in effect, tend to be aligned with safeguarding rich biodiversity and keeping the ecosystem in balance with respect to natural resource use, avoiding chemicals such as herbicides or pesticides[32]. On the other hand, farmers depend on the pollination services provided by bees and other insects to secure their crop yields, both in terms of quality and quantity, thereby it is in their own interest to adopt climate-resilient agronomic practices that help reduce the use of chemicals and preserve the natural ecosystems in/around cropland. Beekeeping represent a production system that, more than any other, helps us understand how producer's needs are closely aligned with paying attention more generally to natural resources and their sustainable use[33]. In this sense beekeeping is the banner or key activity under the entire project.

144. The importance of the beekeeping value chain in the project areas lies in: (i) the size of the bee population, with a significant number of beehives (2,100 in the 3 municipalities of Syunik, and 1,540 in the 2 municipalities of Vayots Dzor); (ii) diversity in terms of melliferous flora and natural and cultivated ecosystems, allowing for the practice of transhumance, and honey production for which there is strong demand; (iii) the existence of strong demand from the population to practice beekeeping, specially from young unemployed; and (iv) the existence of a beekeeping tradition which however needs to be modernized to meet production and marketing standards. On the other hand, the value chain currently faces constraints in the form of disease management problems using natural techniques, queen rearing, out-dated honey production equipment, transportation costs for transhumance movements, low production levels and low value added.

145. In the framework of the consultation process for the planning and implementation of the landscape restoration actions described in Outcome 2.1, the target municipalities and the local population groups will have identified and prioritized a number of economic opportunities resulting from the planting, management and conservation of multipurpose native species. Although consultations during project formulation have already identified beekeeping as a priority economic activity, especially for young unemployed, other products such as wild fruits and herbs may also arise. The PIU will produce a directory and a GIS map of potential products and producers in the target areas, and will hire an expert, following the same procurement procedures as the established in the IRFSP baseline project, to undertake market analyses identifying potential market opportunities, mapping the market networks, understanding the relationships between actors, etc. The PIU will hire another ecologist with knowledge about sustainable NRM, in order to assess the availability of wild products in the natural ecosystems within the target municipalities, and develop management guidelines for the sustainable harvesting (e.g. harvesting techniques, collection period, volumes to be harvested) of the target products.

146. The PIU together with the target municipalities will organize a number of information events locally to raise awareness about the potential economic opportunities derived from the landscape restoration actions and the funding opportunities provided by the GEFTF project to support a number of demonstration actions supporting the establishment or strengthening of local associations or cooperatives willing to produce and market the selected wild products. The GEFTF project will make available grants up to USD 12,000 (an average of 75 grants in total, distributed among target municipalities) to cover the necessary investments that local associations or cooperatives may need for the production, processing and marketing of high quality honey and other selected products. The PIU together with the target municipalities will establish selection criteria to become eligible for the grants, to be decided as part of the planning process of Outcome 2.1. Among the necessary conditions to access funds, will be: (i) the economic activity takes place totally or in part in the restored communal lands, making sustainable use of the selected wild products; (ii) sustainable natural resource management plans should be provided as part of the application process; (iii) the association or cooperative assumes the task of maintaining and managing the restored areas; (iii) the association or cooperative includes at least 80% of highly vulnerable community members, with special attention to young unemployed and women.

[32] Amourag A. 2010.
[33] Christmann S. 2012.

147. The PIU will hire a service provider (most probably the same service provider in charge of Outcome 1.2) among those national NGOs and others with demonstrated solid experience on supporting the institutional development and production, processing and marketing operations of local agriculture cooperatives and associations with a gender and youth focus. The selection process will follow the same procurement procedures established in the IRFSP baseline project. The service provider will support the local associations or cooperatives throughout the value chain steps – sustainable harvesting, production, processing and marketing - through training, technical inputs, and periodical visits to the target areas to supervise the process and monitor results and impact. The national expert in charge of the market analyses, will also be hired in a short-term basis of about 20 days from year 2 to year 5 – following similar procurement procedures established by IRFSP project – to support the marketing and certification aspects.

148. The Project will build on the lessons learned from previous experiences on the organic production and marketing of wild products in Armenia, such as the various projects supported by the United States Department of Agriculture (USDA), USAID, FAO, and the United Nations Development Programme (UNDP), and the project "Development of Biological Agriculture and Bio Certification in South Caucasus" supported by SDC and HEKS (2002-2010), with technical assistance provided by GTZ.

149. **Component 3 – Enabling environment to enhance the capacity of smallholder farmers against land degradation (GEFTF Contribution: USD 350,000)**

150. The GEFTF Project will be instrumental in supporting the mainstreaming of SLM and CC adaptation knowledge in decision-making, rural planning and agriculture production processes, promoting broader awareness and know-how on land restoration and climate-risk reduction needs among rural communities in Armenia.

151. This project component will build the capacity of individual farmers, farmer associations or cooperatives, water user associations, civil servants and other local stakeholders to adopt sustainable farming systems and technologies (e.g. EIT, CA, OA, IPM), produce and implement ecological restoration plans, and develop sustainable value chains for high quality wild products, such as honey, fruits and herbs, that incorporate soil and water conservation, and climate-risks reduction needs.

152. The most critical factor to encourage the uptake of sustainable farming systems and technologies is to achieve a change in perception among decision-makers and practitioners, which can lead to a better understanding and acceptance, and to the establishment of incentives for sustainable land management practices and technologies. This requires extensive collaboration among farmers, researchers, extension personnel, NGO, and decision-makers, to verify and adapt know-how to local conditions, share lessons learned, and transfer/upscale successful results to other areas in the country. The resulting information will allow politicians to formulate effective policies and adopt the financial mechanisms needed to extend the nationwide adoption of sustainable land management in Armenia.

153. As a result of the community empowerment effort carried out through the GEFTF, at least 80% of the beneficiaries and small agribusinesses set up through the baseline intervention will operate on the basis of sustainable land management and climate resilient farming systems.

154. ***Outcome 3.1. – The capacity of key practitioners to adopt sustainable land management practices and technologies is upgraded (GEFTF: USD 250,000)***

155. This outcome will build the adaptive capacity of key civil servants and agriculture practitioners – individual farmers, members of farmer's associations and cooperatives, extension agents - at the municipal and marz level to mainstream sustainable farming systems and technologies, ecosystem-based landscape restoration, and resilient value chain development in integrated rural development in the target areas.

156. The capacity development component will be implemented through a progressive process of knowledge generation and sharing, starting with a baseline inventory of successful experiences related to sustainable farming systems, ecosystem-based landscape restoration, and the economic value and business opportunities for wild products (e.g. bee products, wild fruits and herbs) in Armenia and elsewhere. The learning process will include three consecutive stages: (i) comprehensive inventory, assessment and critical analysis of existing knowledge; (ii) learning from available local/international experience and from field

demonstration actions implemented by the GEFTF Project; (iii) elaboration of findings and recommendations addressing prospects for sustainable farming practices and landscape restoration in Armenia in the long-term.

157. The capacity building programme will be carried out according to the principle of "learning-by-doing", through the implementation of theoretical and practical training modules that will be demonstrated in the field together with the project beneficiaries, during the implementation of the marginal land conversion into agroforestry (Outcome 1.1), the green house crop diversification in women-headed farmland plots (Outcome 1.2), the landscape restoration interventions (Outcome 2.1), and the development of wild products value chains (Outcome 2.2). Specific Training modules will be tailored to women and youth capacity building needs, both in terms of technical skills and the institutional development of local cooperatives or associations for the processing and marketing of high value vegetables, bee products, and other wild products from the restored natural ecosystems.

158. The same service providers and national/international experts hired by the PIU for Component 1 and Component 2 will have the responsibility to design and implement capacity building programmes, including both the institutional development of target organizations and the provision of the necessary technical skills to mainstream land degradation mitigation and climate-risk reduction into agriculture development and landscape restoration in the target areas. The PIU will identify suitable national experts among academia/research institutions and NGO active in climate-resilient agronomic systems and technologies, SLM, Landscape restoration, value chain development and certification.

159. The hired service providers, and international and national experts, based on extensive bibliographic research, visits to relevant academia/research and public institutions and to successful experiences in the field, and questioners with focus groups in the target municipalities, will produce draft assessment reports, including a SWOT analysis and elements of success for the adoption of sustainable farming systems (e.g. EIT, CA, OA, IPM), landscape restoration, and resilient value chain development for honey and other wild products in the different target areas, potential risks of failure, and recommendations applicable to the Armenian agro-ecological context– taking into account current land degradation status and CC predictions. The outcomes of these assessments will be used to design learning programmes and modules, for producers' associations or cooperatives, water users organizations, and municipality members, addressing all relevant institutional development, organizational, management, and technical issues. Specific training targeting women and youth will enhance their participation in the targeted value chains, and provide the necessary skills to run new cooperatives and small businesses. The capacity building programme will benefit approx. 6,000 farmers. The programme will include: (i) theoretical training modules organized in the premises of the target municipalities, WUAs, and farmers' organizations; (ii) field demonstration modules, scheduled throughout the implementation of the different field activities; (iii) horizontal learning involving exchanges between the different sites in the target marzes and municipalities.

160. The following themes will be addressed by the capacity building programme:

(i) Learning about climate modelling showing changes in future climate water requirements for agroforestry and vegetable crops in Armenia[34], to understand climate change impacts on selected value chains – high value agroforestry fruit trees and vineyards, vegetables and wild products - and learning about making decisions for adaptation measures, such as timing of planting, choice of crops and crop varieties better adapted to current/predicted climate and local agro-ecosystems, application of fertilizers, herbicides, pesticides and increasing the effectiveness of irrigation system to help reduce climate-risks and diversify production;

(i) Knowledge on climate-resilient agricultural production systems and technologies (e.g. EIT, CA/OA; integrated pest management) that help raise productivity, obtain quality products, and optimize the use of inputs to lower production costs, by reducing climate-risks and improving environmental services supporting agriculture production; water harvesting technologies in the establishment of new fruit tree plantations: (i) rock removal from plots to build stone bunds in proximity to plots to minimize the

[34] Melkonyan, A. (2014) Environmental and socio-economic vulnerability of agriculture sector in Armenia. Science of the Total Environment 488-489 (2014)

erosive impact of water runoff; (ii) installing impluvium to improve rainwater collection for crops such as almond; and (iv) optimizing the use of drip feeds for fruit trees;

(ii) Training to WUA, Municipality civil servants, and interested individual farmers and farmer groups on landscape restoration planning and implementation techniques, following an ecosystem-based approach, addressing all plant production, soil preparation, planting and maintenance protocols; specific training on bio-engineering techniques to stop and reverse soil erosion problems;

(iii) Training to farmers' groups and young and women organizations about management guidelines for the sustainable harvesting and production of wild products (bee keeping, wild fruits and herbs);

(i) Training to farmers' associations and cooperatives regarding institutional development issues, post-harvesting, processing and marketing of selected value chains from high value crops and wild products (e.g. honey, fruit and herbs) to reducing post-harvest losses, optimize fresh product collection, storage and transportation, raise productivity and diversify production (raw and processed products) without increasing pressures on natural capital.

161. The project pilot field interventions and learning-by-doing activities will generate valuable knowledge - lessons and best practices on land degradation mitigation, SLM, climate-resilient farming systems, landscape restoration, and sustainable NRM - to be shared with interested actors in Armenia and elsewhere. The PIU will support the preparation of a number of awareness raising printed and audio-visual material that capture lessons learnt and impact. Printed copies will be disseminated during field work, conferences, through mailing, etc, and will also be available at the PIU, MNP and MoA. Main anchoring points for knowledge management will be identified, including research institutions, civil society, regional KM networks and specialised service providers.

162. The PIU will take care of the monitoring and evaluation of the learning process, through the production/use of monitoring/evaluation tools and by collecting feedback from all trainees. The quantitative and qualitative expansion of demonstrated systems and technologies will also be used as an indicator to evaluate the effectiveness of the capacity building process.

163. **Outcome 3.2. Policy processes for SLM in Armenia are enhanced (GEFTF: USD 100,000)**

164. The PIU will assess current policies and regulations that may facilitate or prevent the adoption of sustainable farming systems and technologies and ecological restoration techniques. The policy revision will not only look at specific legal rules supporting agriculture development, farming, livestock grazing and forestry approaches, but also at the coherence with existing legislation on cross-cutting policy issues such as combating desertification, climate change, water use, soil protection, the use of herbicides, pesticides or other chemicals, the use of crop residues, bio-energy production, land tenure, forestry, etc. Agriculture and agro-forestry related incentives or subsidies and credit lines will be screened and evaluated, to ensure that they do not jeopardize the farmers' ability to adopt sustainable farming practices. The positive effects of SLM in the conservation and management of protected areas and high value natural areas in the target municipalities will also be assessed, in order to propose policy recommendations for the application of integrated natural resource management (INRM) practices in the wider landscapes.

165. The policy review will also look at: (i) co-ordination mechanisms across governmental agencies and departments to address mainstreaming and cross-compliance, and reduce the likelihood of conflicts in the implementation of sustainable farming, sustainable NRM and ecological restoration work; (ii) the legal aspects of farmland leases, to identify gaps and needs in farm lease arrangements with regard to the obligations that the lessee farmers has to meet on the sustainable management of the natural resources, sustainable farming systems, sustainable use of agrochemicals, etc.

166. The PIU will develop a collaboration framework with the Armenian National Agrarian University (ANAU) and the Environmental Research and Management Centre (ERCM) to undertake the policy analyses and other possible organizations. The results of this review will be presented at a national seminar on supportive policies for sustainable agriculture and NRM, and the enhancement of ecosystem services in the face of preventing land degradation and climate-risks and improving biodiversity in the Armenian rural landscapes. The seminar will be organized on Y3 of the project under the patronage of the MoA and the MNP, involving policy-

makers, civil servants, research/academia, extension organizations, farmer organizations, private sector, and NGOs.

167. The debate and inputs generated during the national seminar will be gathered by the PIU, and used to prepare draft policy papers, which will include a set of proposed recommendations to boost sustainable farming systems (e.g. EIT, CA, OA, IPM), drive rural development and planning, and support small-scale private investments in by-products from ecological restoration actions through the set up of a conductive policy framework, sustainable harvesting regulations, and market incentives. Comments and inputs of the civil society, the private sector and any other concerned stakeholder will be gathered to produce a final version of the papers. The main output of this Outcome will be an agreed road map for policy improvement in the fields of sustainable agriculture production, rangeland management and agroforestry that will be driven by the Government, based on the produced policy papers, and with the external support and assistance of IFAD.

168. **Component 4 – Project Management (GEFTF Contribution: USD 187,500)**

169. The overall responsibility for planning, management and implementation of the Programme would rest with the existing IFAD Programme Implementation Unit (RAED PIU), which has been responsible for the successful management and implementation of all previous IFAD-financed projects and programmes in Armenia. This PIU has experienced and competent staff and is fully capable of managing and implementing the fully embedded IRFSP baseline and GEFTF projects with minor staff increases to improve capacity mainly in the engineering department. As with previous IFAD programmes the PIU will operate under the authority of the Prime Minister's office through a Programme Steering Committee set up for the purposes of the Programme.

170. Effective project management, oversight and coordination, as well as mechanisms to monitor, evaluate, capture and disseminate lessons-learned and best practices are an essential component of the proposed project. The GEFTF Project will hire a Project Coordinator who will be part of the PIU, and will have assigned project management responsibility to ensure the quality of the GEFTF interventions, and the adequate integration with the IRFSP baseline Project. The Project Coordinator will be hired based on a competitive call, and final the selection will be done by RAED PIU Director, based on IFAD NO Objection.

171. This component would finance project management, coordination and technical supervision of the implementation of the various activities of the fully blended IRFSP and GEFTF projects including, financial management, procurement, monitoring and evaluation. In addition to the provision of staff and operating costs for the project, specific provision has been made for financing of baseline survey, interim and final impact evaluation surveys, workshops and staff training in specialised areas related to overall project management.

172. The project will adopt the GEO-Result Based Management and Monitoring System developed by IFAD. The system merges key element of PDRs (LFM, COSTAB, PIM, WP) together with a set of dedicated geographical elements (GPS coordinates, maps, charts, satellite pictures) in order to ensure and enhance: (i) SMART Design Process; (ii) Improved supervision; (iii) Advanced no objection process[35]; (iv) Sound SMART M&E process; (v) Improved communication and coordination; (vi) Tailored impact evaluation. The PMU staff will be trained by IFAD on System use and management.

F. Additionality and Adaptation benefits

173. The Project, in alignment with the mandates of GEFTF programming on Land Degradation, focuses on identifying, implementing, and transferring best practices in SLM and landscape restoration in support of rural livelihoods. With funding from GEF, the IRFSP baseline project as a whole will become an innovative programme in which municipalities and rural communities put into practice resilient farming systems and technologies to land degradation and climate-risks in communal lands, by means of demonstrative pathways, including economic ones, for further replication and up-scaling.

174. GEFTF funding represents an opportunity to broaden the scope of the rural development objectives pursued through the baseline IRFSP project in light of the expected land degradation impacts on the already fragile agro-ecosystems, soil and water conditions, and

[35] If properly fed with GPS coordinates, the system allows a deep understanding of proposed activities according to the areas where the project intends to work (i.e. afforestation, irrigation, soil conservation, others) and therefore can support CPMs in providing no objections.

irrigation infrastructure. Without the GEF funding, the baseline intervention will not tackle the root causes of the main environmental constraints facing agriculture development in Armenia, reducing the likelihood to increase productivity and reduce food security risks in the long-term.

175. The GEFTF funding will aim at mainstreaming environmental sustainability in the baseline investments in irrigation infrastructures and agriculture value chains, and enhancing the capacity of municipalities, WUAs, farmer's associations and cooperatives, civil servants and extension services to address the environmental risks causing land degradation and agriculture productivity loss. This will be done mainly by focusing on environmental-friendly measures that promote the sustainable management of water resources/infrastructures, that incorporate soil and water conservation into farming systems, and that help restore degraded natural vegetation along stream banks, irrigation channels and communal lands. Building on the activities carried out by the baseline, the GEF will cover the additional costs associated with erosion/siltation reduction, soil and water conservation in agro-forestry farming systems and landscape restoration, as well as the improvement of the policy incentives to mainstream SLM and climate-risk reduction in the agriculture sector. The GEF project will be fully blended to the IRFSP baseline programme to secure a synergistic and complementarily approach. The suggested pilot developments under the GEF would become models for replication and scaling-up across regions in Armenia.

176. The core target group will remain the same as that of the IRFSP, namely municipalities, WUAs, and poor smallholder farmers that cultivate crops and make use of the communal lands in the command area of the irrigation schemes to be rehabilitated by the baseline, willing and able to move towards more commercial production. The project will put particular emphasis on poor rural women-headed households and unemployed youth, the most vulnerable group to environmental risks. Due to the inclusive nature of the irrigation rehabilitation and landscape restoration, whereby the target landscapes – the territories of the municipalities - will be improved, farmers who are outside the core target group of the GEFTF project may also benefit. Recovery of assets and promoting sustainable land and water management systems and techniques would enhance farmland and natural vegetation productivity, would help diversify production, and increase income generation among the target beneficiaries.

177. The targeting approach, strategy and gender mainstreaming of the proposed project under the GEFTF financing will be consistent with that of the IRFSP, which comprises geographical targeting, self-targeting and direct-targeting. It will be reinforced and refined in order to align the strategy with the specific characteristics and requirements arising from the nature of the proposed investments (irrigation improvement, sustainable agro-forestry and high value crops farming, and landscape restoration).

178. The table below summarizes the additional benefits of the GEFTF interventions.

Table 6. Additional Benefits of the GEFTF interventions

GEFTF PROJECT COMPONENT	ADDITIONAL BENEFITS
COMPONENT 1	• The support to municipalities and small farmers groups making use of communal lands for EIT, CA/OA systems and technologies, and better adapted crop varieties, shall increase soil water content and reduce 30-80% of water requirements for crops in the converted farmlands. Soil organic matter, soil water storage, and soil fertility shall significantly improve leading to higher and more stable crop yields under climate variability in drought affected years. • Expected up to 50% yield increases, and higher quality goods with increased market sales. • Water quality shall improve in farmland under CA due to 20-50% lower use of fertilizers and pesticides. • EIT and CA technology successfully tested and adopted by 80% of target population. • Reduction in machinery, fuel and labour requirements for CA will increase profits and available time, mainly for poor-asset women and youth. • Reduced emissions due to 60-70% lower fuel use, 20-50% lower fertilizer and pesticides use, 0.2-0.7 t/ha/y sequestered carbon and no CO2 release as a result of no burning of residues
COMPONENT 2	• Soil erosion shall decrease between 60-90% in farmland under diversified agroforestry systems, in restored degraded ecosystems along riverbanks, irrigation channels and close to farmland plots. • Quantification of the benefits deriving from the value chains linked to wild products (e.g. honey, fresh/dry fruits and berries; dry herbs) suggests that it will result in about 25% incremental annual benefits. • Innovative "soft" biotechnologies and ecological restoration measures to prevent soil ero-

	sion and climate risks, improve environmental services, and generate complementary income opportunities from wood and non-wood forest products and pastures will be successfully implemented in about 880 ha. • The restoration of vegetation shelterbelts will help reduce about 20% of soil evaporative losses in summer, reduce evaporation from irrigation channels up to 30%, increase at least 25% of yields, and have large wind erosion control benefits.
COMPONENT 3	• Municipality members, WUAs, women groups and farmers' association and cooperatives will be trained on the SLM benefits of EIT, CA/OA, and landscape restoration measures and technologies. • On-farm demonstrations will allow project beneficiaries to exchange know-how, learn and apply EIT, CA/OA and ecological restoration measures and technologies, as well as the institutional issues of farmers' organizations (WUA, Farmers' organizations and cooperatives). • Target women and young unemployed small businesses and cooperatives will be trained on and have applied value chain skills (production, harvesting, post-harvesting, processing and marketing skills). • Guidelines to mainstream SLM and climate-risk reduction in selected policy frameworks and regulations developed and disseminated to policy-makers. • Information materials featuring lessons learned prepared and disseminated widely to practitioners and society in general.
COMPONENT 4	• The GEFTF will integrate SLM and climate-risk reduction expertise in the baseline programme management and monitoring. • The GEFTF will cover the additional costs for a Project Coordinator to ensure the overall implementation of the GEFTF activities and effective integration in the baseline. Experts and service providers will be hired to provide technical support and guidance for the implementation of the different project components, and help integrate SLM and climate-risk reduction in the IRFSP baseline interventions and M&E system.

179. Global environmental benefits

180. The proposal will be designed to achieve Global Environmental Benefits (GEBs) under the Land Degradation Focal Area whose purpose is to foster system-wide change to control the increasing severity and extent of land degradation in order to derive GEBs through sustainable land management (SLM) systems and technologies. In addition to the direct social and economic benefits that will be gained from addressing land degradation through the use of SLM practices and landscape restoration measures, the project will: (i) improve the integrity of agro-ecosystems and their environmental services;□(ii) increase carbon stocks and reduce carbon emissions in the restored landscape areas and in the farmland plots under sustainable farming systems;□(iii) preserve and restore degraded natural habitats contributing to improved ecosystem stability and to the protection of agro-biodiversity of global importance;□(iv) reduce erosion rates in the target landscapes including ecosystems and protected areas of international importance.□A further indirect benefit potentially yielding GEBs elsewhere is□(v) contribute to a more programmatic approach to SLM at national level, including more investment in SLM. These practices and lessons will be compiled and made available for adoption in other landscapes of the region and the country.

181. The GEFTF project will contribute to the LD FA Objective LD-1 ("Maintain or improve flow of agro-ecosystem services to sustain food production and livelihoods"), Programme 2 ("SLM for climate-smart agriculture"), Outcome 1.2 ("Functionality and cover of agro-ecosystems maintained"), and to the Objective LD-3 ("Reduce pressures on natural resources from competing land uses in the wider landscape"), Programme 4 ("Scaling-up sustainable land management through the Landscape Approach"), Outcome 3.2 ("Increased investments in integrated landscape management").

182. The indicators to track global environmental benefits will be: (i) Indicator 1.2 "land area under effective management in production systems with improved vegetation cover", targeting 800 ha of agro-forestry planting in marginal communal land, and 880 ha of restored natural vegetation cover in the territory of the target municipalities; (ii) Indicator 3.3 "increased investments flowing to INRM and other land uses from divers sources", targeting about USD 2,765,000 of new investments in INRM (e.g. agro-forestry planting, women-headed farmland plots, natural vegetation restoration, honey and other wild products value chain development).

G. Liaison with other initiatives

183. There are good prospects for the establishment of formal links with complementary Projects being implemented by the GOA and other donors, which would have a direct relevance to the GEF Project. A preliminary agreement has been reached for a Public-Private Partnership agreement between the IRFSP Baseline Project and the Armenian Water Sewerage Company

(AWSC) for the implementation of the Community Water Supply (CWS) Component. Likely complementary projects for linkages are:

I. The results of the 2006-2011 Millennium Challenge Account Corporation (MCA) investments in irrigation, which included irrigation system rehabilitation works, farmers' training and demonstration plots on efficient irrigation technologies and WUA strengthening;

II. The WB Irrigation System Enhancement Project (ISEP) dealing with water infrastructure construction and WUA strengthening; a MoU was agreed between ISEP and the IRFSP Baseline Project; several NGO training and support operations to boost the activities of the national extension services

III. In terms of farmer awareness and support, the GEF Project will be able to leverage the work of a number of donor partners, which will greatly increase the effectiveness of Component 3, such as: the WB support for WUA development and Livestock services; USAID support for financial training for farmers; FAO activities in extension; ADB's efforts in training for women entrepreneurs; numerous NGO training and support operations, which boost the activities of the national extension services.

IV. The OSCE environmental portfolio that is funding 15 regional environmental offices in the Country, which could be used by the Project as service providers.

V. The GEF funded project "Enhancing Livelihoods in Rural Communities through Mainstreaming and Strengthening Agricultural Biodiversity Conservation asnd Utilization" implemented by UNEP.

VI. The World Bank Natural Resources Management and Poverty Reduction Project (NRMPRP) specifically includes activities to promote community-based forest management in Armenia. The forests around two communities in northern Armenia have been allocated to local villagers through Hayantar to test the effectiveness of community forestry. NRMPRP also includes measures to improve pastures and grazing techniques.

H. Risks and assumptions

184. The main risks and measures to mitigate them are outlined in the table below:

Table 7. Main risks and mitigation measures of the GEFTF Project

Risk	Level	Mitigation measures
On-the-ground implementation slowed by bureaucratic constraints	**Medium**	- The project will couple a participatory approach with sufficient institutional strengthening. The baseline programme will ensure adequate remedial measures to minimize this risk.
Insufficient and inadequate staffing for backstopping	**Low**	- In addition to the line ministries departments and services, the project will involve international and national technical assistance and service providers for backstopping. The project will engage in a comprehensive training and awareness raising program targeting all concerned actors (government institutions, extension services, research/academic institutions, NGO and farmers), to ensure that its approach and objectives are fully understood and integrated in their work. The GEFTF funding will empower all stakeholders to deal with SLM and climate-risk reduction.
Disbursement delays	**Medium**	- Technical assistance mobilized to support preparations for project start-up; - Project will benefit from the experience of IFAD projects and IRFSP baseline PIU staff and skills.
Loss of institutional memory	**Low**	- The project will ensure that all project activities and achievements are well documented (soft and hard copies of all documents will be kept). Information on the project will be disseminated to key stakeholders.
Land size and tenure issues have a negative impact on project implementation and on sustainability of	**Medium**	- The Project will pay particular attention to land size and consolidation mechanisms. It will build on the baseline experience – IFAD programmes in the creation of successful WUA, SME, and other farmers' organizations, and the provision of leadership and management skills to consolidate land. - The project will also focus on awareness raising and capacity

achievements.		development to clarify land tenure issues and identify effective solutions to promote adaptive land restoration measures in private and communal land.
Insufficient application of targeting procedures, with special attention to gender issues.	**Low**	- Targeting will be aligned with IFAD's policy and approach in Armenia. Effective monitoring and evaluation procedures will be established to ensure that targeting is adequate. Gender issues are already well embedded in IFAD's country programme. The project will strive to involve the maximum number of women beneficiaries in its activities, at it will pay special attention to the creation of new jobs for women through complementary, off-farm activities.
The lack of access to financial services and markets discourages innovation and technological improvement.	**Medium**	- Increased availability of financial means for smallholder farmers is a major component of the IRFSP baseline. - The GEFTF will raise awareness of financial institutions about the type of investments supporting SLM and climate-risk reduction, and will support the definition of criteria to guide financial support to target farmers. - The sustainable farming practices supported by the project (agroforestry, EIT, CA, OA, climate-resilient processing equipment) will help improve yields, quality and safety of products, and thus might open new market opportunities.
Weak political will to streamline SLM and climate-risk reduction, consolidate the institutional framework and enforce laws.	**Medium**	- MoA is highly committed to support SLM and climate-risk reduction systems and technologies as a major need to prevent land degradation and ensure sustainable yields. - The NCSA project in Armenia has ensured a highly participatory process identifying links between Rio conventions priorities for Armenia. - The Government is also engaged in the implementation of several National Programs that seek to address SLM and climate-risk reduction in the crop production, livestock and forestry sectors in a comprehensive and holistic way.
Recurrent CC related impacts such as drought, runoff erosion due to floods, and hailstorms threaten the implementation of activities	**Medium**	- The measures to mitigate such risks are contained in each of the 3 Project components. Activities will target SLM and climate-risk reduction deficit of the country, empower farmers/institutions and promote adaptive practices and infrastructures. All measures combined aim at reducing climate change vulnerability and improving management of natural resources and production systems.
Environmental impact of works and activities in the programme area	**Low**	- The irrigation infrastructure rehabilitation and modernization will incorporate environmental impact assessment criteria in the selection of the promoted technologies, following IFAD and other partners' experience in Armenia and neighbouring countries. - Part of the ecological restoration interventions will enhance the environmental sustainability of the irrigation infrastructure (e.g. vegetation shelterbelts along irrigation channels and bio-engineering structures to reinforce eroded riverbanks).
Uncertain Operation and Maintenance Cost recovery strategy for Irrigation Infrastructure	**Medium**	- The project will ensure a set of activities that will reduce cost of maintenance and increase interest in participating in the operational costs. - The project will ensure monitoring of the involved WUA and Municipalities in order to ensure effectiveness of the system established by Armenian lows and practices.
Overall Rating	**Medium**	

I. Sustainability and replicability

185. Moreover, the project will contribute to integrate SLM systems and technologies (e.g. EIT, CA, OA, IPM) with agro-landscape restoration measures to improve soil and water conditions at a broader landscape level, and mitigate the expected exacerbation of soil erosion and land degradation. The project will focus on successful landscape restoration planning, methodologies and techniques supporting effective soil preparation and planting techniques for selected multipurpose native plant species, to ensure healthy plant growth and the long-term survival of the restored vegetation. Lessons learned from the project field demonstration actions will be gathered, analysed, compiled and disseminated to help replicate and upscale them within the target marzes and elsewhere in Armenia.

186. Sustainability will be sought through a broad and deep capacity building (CB) programme, designed to create a critical mass of capacity for CA at the national level, and among all actors – from institutional to grassroots. The CB process will integrate strong participatory elements

to fully address issues that affect the sustainability of natural resources and the welfare of local communities (continuous training and on-farm demonstrations to consolidate adoption of SLM and ecological restoration methods and techniques, and encourage adoption by other farmers in the region). The restoration of shelterbelts and vegetation in the target areas, and the enhancement of their protection functions will contribute to the stabilisation and health of the agro-ecosystem, thus to the sustainability of the project.

187. The sustainability of the project is also guaranteed by the full involvement and empowerment of smallholders throughout the various components of the project. Smallholders will be the targets of the awareness raising and capacity building programme, and they will be the main beneficiaries of the components on production/processing improvement and the provision of new technologies.

188. The IRFSP baseline support for rural investments and the innovative funding opportunities for small farmers from RFF and other possible organizations can be further developed by scaling up their capacity to invest in a larger scale and by introducing new, innovative approaches in their operations with the objective of reaching IFAD's ultimate target group in a more effective manner.

189. IFAD's specific role will be to lead the design process, and to ensure appropriate guidance during supervision of the programme, conduct impact assessments and studies to document the lessons learned so far. Results of the pilot adaptation actions will be disseminated widely within and outside the project area. Moreover, the project will be linked to ongoing regional and global programmes to ensure exchanges and dissemination of information at a wider scale using the IFAD website, UNFCCC, GEF and other platforms for experience sharing.

190. The GEF will be designed to maximise the possibility of upscaling lessons learned and best practices beyond project finalisation, and the need to expand the adoption of efficient irrigation technology, sustainable land management, and adaptive restoration practices beyond the project area. The strong capacity building component and the involvement and buy-in of all concerned stakeholders will undoubtedly facilitate this task.

Part VI – Project implementation

Project oversight

191. The existing IRFSC Project Implementation Unit (PIU), that has already been responsible for successfully managing the implementation of several IFAD/OFID rural development programmes, would have overall responsibility and leadership for coordinating the implementation of the GEFTF Project components. As with previous IFAD projects in Armenia, overall responsibility for Programme management and implementation would rest with ~~a~~ the baseline Programme Steering Committee (PSC)[36] reporting to the Prime Minister's Office (the LPA).

192. The principal functions of the PIU would be to carry out the overall programming and budgeting of Programme activities, take direct responsibility for implementing the irrigation rehabilitation works, rural infrastructure, SLM, Ecological Restoration and capacity building issues, as well as monitoring and documenting Programme progress. In this respect, lead responsibility within the PIU would rest with: (i) the PIU/Project Director for overall programme management; (ii) Project Coordinator hired by GEFTF project in consultation with RAED PIU Director and based on IFAD No objection will ensure effective project coordination, implementation, management, adequate identification and promotion of suitable investments in EIT, CA, OA, and other SLM and landscape restoration technologies through the project grant schemes, and full integration of the GEFTF Project into the IRFSP baseline interventions; (iii) the Engineering Division (ED) under the supervision of Project Coordinator will lead the rural infrastructure rehabilitation and modernization component, (iv) M&E Division under the supervision of Project Coordinator will lead the capacity building and monitoring programmes, conducting annual outcome surveys, fund-raising, and collection of regular monitoring data, as well as project reporting and knowledge management; (v) The Office Management division in consultation with Project Coordinator will be responsible for the organization, coordination, and supervision of the PIU to ensure the smooth flow of its work Programme; (vi) The Finance division will be responsible for the generation of documents that will ensure the proper acquisition of assets, services, and equipment, for establishing efficient and effective funds disbursement, and developing coordination mechanism among the PIU units that is prior sent for IFAD No objection by the ~~Project~~ GEF Coordinator through PIU's Director ~~, and will answer of its activities to the Project Coordinator who is under the direct supervision of the RAED PIU Director~~. The PIU divisions will also be responsible for coordinating the experts and service providers, selected by the PIU following IFAD guidelines, in charge of the assessment and feasibility studies, and the provision of technical expertise for the adoption of sustainable farming systems and technologies and the implementation of ecological restoration actions. All proposed activities shall be sent for IFAD No objection by Project Coordinator.

Annual Workplans and Budget

193. The ~~Project~~ GEF Coordinator, in consultation with national and international partners, will prepare draft Annual Work Plans and Budgets (AWPBs) for each Project year and will ensure, under the supervision of the PIU's Director, its adherence with the baseline AWPB. ~~and through PIU~~ The consolidated AWPB (IRFSO + GEF) will be submitted, by the PIU's Director, to the Programme Steering Committee (PSC) for review and approval. The draft AWPBs would include, among other things, an annual procurement plan, a detailed description of planned Programme activities during the coming Programme year, and the sources and uses of funds. If required, the PIU, through the PSC, could then propose adjustments in the AWPB during the relevant Programme year, which would become effective after subsequent clearance by IFAD. Provision has been made in the Programme costs for Annual Stakeholder Review and Planning Workshops at which Annual Performance Report findings and management implications would be discussed and fed into the AWPB preparation process.

194. **Progress Reports.** The ~~Project~~ GEF Coordinator in consultation with PIU would submit both semi-annual and annual progress reports in English to IFAD to provide essential information on the physical and financial progress of Programme activities and regular assessment of Programme impact using a format that would be agreed at the time of Programme start-up. These progress reports would then feed into the Annual Progress Reports.

[36] Project Steering committee is composed of: (i) ,(ii) ,(iii) , (iv) ,(v) and has the following mandate:

195. **Supervision.** The IFRSP/GEFTF fully blended project would be supervised at three different levels. Overall responsibility for implementation and supervision on behalf of the GoA would be through the PIU acting directly under the Programme Steering Committee. For the technical supervision of works financed under the Project, PIU in consultation with National Project Coordinator and based on the TOR developed by NPC in consultation with IFAD and/or based on No Objection of IFAD, would hire specialized consultants to ensure that specifications are adhered to and outputs are achieved as planned. For supervision by the external financiers, IFAD will supervise and be responsible for the fiduciary aspects and Loan Administration of the IFAD financed parts of the Programme and OFID will have the same responsibilities for the OFID financed parts of the Programme. IFAD will continue to provide information to OFID on Programme progress as it is obtained through IFAD supervision and implementation support missions. AWPBs will be submitted concurrently to IFAD and OFID for the approval of the parts of the Programme for which they are responsible. IFAD will also conduct a Mid-Term Review (MTR), impact studies, and a final project completion review as per standard practice.

196. In addition, another important special area for attention should be for IFAD supervision to try to ensure a creative and energetic implementation of the project Outcomes. Past experience suggests that this kind of technical support and capacity building programmes being implemented by local NGO's or service providers can be difficult to implement successfully unless it is actively supported by the executing agency (in this case the PIU) to help clear logistical and institutional hurdles that will surely arise during implementation. Given the importance for the Project success, IFAD should be active during supervision in fielding the monitor and adaptive manage expertise needed to help achieve objectives. A special attention to the Project start-up should be given during the first supervision mission by IFAD

197. **Programme Manuals.** All IFAD-supported programmes have developed Programme Implementation Manuals (PIMs) that cover issues such as small works, infrastructure, equity investments, and loans to beneficiaries. The PIM and related manuals will be further developed by a service provider hired by the PIU. The IRFSP/GEFTF Programme Implementation Manual (PIM) will cover all components, Development of Programme Implementation Manual will be one of the Project's start-up activities.

198. **Institutional Development and Outcomes**

199. The IRFSP/GEFTF will contribute to institutional development and outcomes by enhancing the capacity and skills of the Programme Implementation Unit (PIU) staff, which will have overall responsibility for implementation of the Project.

200. **Programme Start-up Activities and Start-up Workshop**

201. **Start-up Activities** of the Programme will include: (i) drafting of the Terms of Reference for key staff (including the new positions in the PIU) and Technical Assistance required for launching the Programme; (ii) recruitment of key staff and TA financed by Programme financiers; (iii) development of a consolidated AWPB for the Programme's first-year activities; (iv) production/finalisation of a Procurement Plan for the first eighteen months of Programme implementation; (v) establishment of the Programme M&E system; (vi) assistance for finalisation of the Programme Implementation Manual (PIM) including manuals for all components; (vii) carrying out of the Programme baseline survey; and (viii) holding the Programme Start-up Workshop.

202. Provision has been made for a Programme **Start-up Workshop**. Among those invited to attend would be staff of the PIU, MNP, MoA, ANAU, FREDA, and RFF as well as representatives of other key potential stakeholders and participants in the Project including, among others, people from: other financial institutions who might potentially be sources of finance for IRFSP stakeholders/beneficiaries; services providers; agricultural equipment suppliers and dealers; Union of Exporters of Armenia; the Federation of Agricultural Associations; relevant Government representatives; deliverers of small-scale rural infrastructure (including local government); socio-economic profilers (e.g. NSS); community-based organisations reflecting the Project's intended target groups; and other projects concerned with rural poverty reduction and development. Key outputs from the workshop would include guidance on: Project components content and implementing modalities; refinement and finalisation of the Programme Implementation Manual (PIM); and refinement and finalisation of the Programme's targeting criteria and M&E indicators.

203. **Integration within the IFAD Country Programme**: As noted previously, the design of the Project builds on the experience gained from previous IFAD rural development projects in

Armenia, particularly with respect to rural finance and rural infrastructure, particularly in terms of basic design features and implementation arrangements. This will ensure consistency within the IFAD Country Programme.

Procurement

204. The Procurement division with project coordinator will oversee all aspects of procurement undertaken by the PIU in the course of project implementation. Project coordinator under the direct supervision of RAED PIU Director and in consultation with procurement division will prepare the project's Procurement Plans in accordance with its Annual Work Plans and Budgets and agrees it with IFAD.

205. Procurement of goods, works and consulting services financed by the Grant shall be subject to IFAD's conditions and will strictly follow the established modalities in the country. The provisions of the procurement regulations of the Government of Armenia will be used, to the extent that such are consistent with IFAD's "Procurement Guidelines" approved by the IFAD Executive Board (the "Procurement Guidelines") as such guidelines may be amended from time to time by IFAD.

206. To the extent possible, the goods, works and consulting services shall be bulked into sizeable bid packages to permit the optimal use of competitive bidding.

207. Before the commencement of procurement and annually thereafter, the Government shall furnish to IFAD for approval, a Procurement Plan as described in the Appendix 1, paragraph 1 of IFAD's Procurement Guidelines. The Procurement Plan shall specify, inter alia, the method of procurement for each contract to be financed from, and thresholds, ceilings and preferences to be utilized in the implementation of procurement under the Project; the Procurement Plan shall also specify any additional requirements as may be set out in the Procurement Guidelines with respect to certain methods of procurement.

208. Three Categories of procurement expenditures are used: (a) Category 1: Goods; (b) Category 2: Works and (b) Category 3: Services.

209. The Government shall ensure that all bidding documents and contracts for the procurement of goods, works and services financed by the GEFTF shall include a provision requiring bidders, suppliers, contractors, sub-contractors and consultants to permit IFAD to inspect their accounts, records and other documents relating to the bid submission and contract performance and to have them audited by IFAD-appointed auditors and investigators.

210. Project Coordinator in close cooperation and under the supervision of RAED PIU and IFAD, based on project activities shall prepare procurement plans and organizes bidding procedures and prepares all necessary documents.

PART VII – Project cost and financing

A. Financing terms and conditions

211. Total project costs are estimated at USD 33,410,500 covering the GEFTF grant of 3,937,500 and a co-financing source of IFAD soft loan of USD 5.9 million, IFAD grants of USD 350,000, and OFID loan of USD 23.2 million. The GEFTF grant is except from taxes and duties.

212. Cost estimates are based on field surveys (detailed IRFSP design mission and GEFTF formulation mission, organized in May 2015).

213. The following table provides the project costs by component and outcome. A breakdown of costs is provided in annex 3.

Table 8. Project costs by component and outcome

Project Component and Outcome	GEFTF Budget (USD)
Component 1 – Investments in Sustainable Farming Systems benefiting from rehabilitated irrigation infrastructure	1,600,000
OT 1.1. Investments in sustainable fruit tree farming systems for increased productivity in marginal communal lands	1,000,000
Outcome 1.2. Efficient land and water management practices for crop diversification and food security adopted by women groups	600,000
Component 2 – Community-led land degradation prevention through landscape restoration interventions	1,800,000
OT 2.1. Ecosystem services supporting agriculture production are restored in the target areas	1,300,000
OT 2.2. Complementary value chain of high quality by-products resulting from landscape restoration developed by farmers' groups	500,000
Component 3 – Enabling environment to enhance the capacity of smallholder farmers against land degradation	350,000
OT 3.1. The capacity of key practitioners to adopt sustainable land management practices and technologies is upgraded	250,000
OT 3.2. Policy processes for SLM in Armenia are enhanced	100,000
Component 4 – Project management	187,500
Total GEFTF Budget	3,937,500

Annexes

Annex 1 - Monitoring and evaluation

214. Project monitoring and evaluation will be conducted in accordance with established IFAD and GEFTF procedures. In line with the GEFTF operational principles, the Project M&E activities will be country driven and will provide for consultation and participation. The Strategic Results Framework provides indicators for project implementation along with their corresponding *means of verification*. These will form the basis on which the project's Monitoring and Evaluation system will be built.

215. The M&E system for the project is an integrated process that encompasses a number of specific actions. There is a dual objective: to ensure technical and procedural control over project activities to maximize efficiency and effectiveness, and to promote training and awareness-raising for direct stakeholders – beneficiaries, public servants and organizations involved – and other indirect stakeholders – other institutions, universities and development agencies.

216. The M&E system is a key cross-cutting project activity and calls for strengthening for the use of data produced not only for control and management effectiveness purposes, but more generally in producing functional knowledge for replication and transfer of best practices in other contexts, both in other production areas and countries.

217. The IRFSP/GEFTF joint monitoring will be a three-level system, consisting of output monitoring, outcome monitoring and impact evaluation. Output monitoring comprises the monitoring of physical and financial inputs, activities and outputs, both planned and actual.

218. Outcome monitoring assesses the use of outputs and measures their benefits at beneficiary level; it focuses on the accessibility of programme outputs and the extent to which they provide benefits to the target groups in terms of access to infrastructure facilities, financial services, markets, etc. It also includes the Programme's achievements in terms of returns, added value, direct and indirect job creation, and prospects for sustainability. The Programme conducts periodical standardized field surveys with Programme beneficiaries. The objective of the field surveys on the outcome level is: (i) provide management with information on quality and usefulness of Programme activities for planning and taking corrective action to remedy emerging issues; and (ii) collect qualitative data on Programme activities to identify success stories and models for replication. To capture qualitative aspects and to sharpen the analysis, the PIU's M&E staff complements the field surveys by conducting interviews with focus groups.

219. Impact evaluation assesses the measured change in selected variables between the beginning and the end of the Programme or a later selected date. The main instruments for the impact evaluation are the Programme's Baseline Survey and Programme Completion Report. The objective of the baseline survey is to establish benchmarks for time-series comparisons between Programme beneficiaries and non-beneficiary 'control' populations. The Field Surveys are used to collect relevant quantitative data for the Completion Report. Such quantitative data covers incomes and assets and increase in employment in the various value chains, thus providing the Programme with a dataset for quantitative impact evaluation. This, through extrapolation from relevant beneficiary strata, allows the evaluation of impact for all relevant value chains on at least the following levels: (i) incremental increase in farmer income and assets measured by internal rate of return (IRR) and net present value (NPV); (ii) employment creation; (iii) incremental increase in regional economic activity; and (iv) incremental increase in tax revenue to the government. The data collected in the course of the Field Surveys are complemented in the last Programme year by additional thematic studies procured by the PIU necessary to measure the full impact of the Programme's interventions.

220. To meet the M&E needs of IFAD and GEFTF, the results and impact management system (RIMS)[37] and the CC-Tracking Tool[38] will be set up at programme start-up with IFAD support. Primary geo-referenced data collection and analysis will be done by the PIU. The project will also contribute data to the national environmental monitoring system in accordance with the DPSIR model[39] used in evaluating ecosystems.

[37] http://www.ifad.org/operations/rims/handbook/f.pdf

[38] http://www.thegef.org/gef/tracking_tool_CCM

[39] DPSIR: Driving forces, Pressure, State, Impact, Response.

221. **Baseline study –** During the first eight months of the project, a baseline study will be done. It will consist of a quantitative and qualitative survey of a representative sample of all beneficiaries, to establish characteristics affecting their adaptation capacity to the effects of climate change prior to implementation of project activities. Other areas of intervention will relate to socio-economic factors and, in particular, their income-generating capacities and competencies. The survey unit will be family production units, or households considered as the most appropriate basic unit for developing a sustainable circular economy

222. **Geographic information system –** This system will have the dual purpose of locating the various project activities in a specific and detailed fashion, as well as project inputs and pre-existing conditions, and facilitating information collection and sharing in the form of photographs, video or documents, using easily accessible open source instruments such as Google Earth40.

223. **Ongoing M&E system with semi-annual reporting** – Monitoring will be based on the initial data, using a system of comparison and recording of progress made over time by the project activities.

224. The project M&E system set up will allow for: (i) meeting the information needs of IFAD and government participants on a timely basis on programme activities, immediate results, and short- and long-term impact; and (ii) producing, organizing and disseminating the information needed for strategic steering purposes. To this end, the project will be supported with technical assistance at start-up to define indicators, install a computer system and develop the data collection and analysis methodology and technical specifications for the baseline surveys.

Monitoring and evaluation GEFTF budget

Type of M&E activity	Responsible Parties	Budget USD (GEFTF contribution) Excluding PIU Staff time	Time frame
Inception Workshop (IW) and report	Project Coordinator/ PCCU/PMUs	USD 3,500	Within first two months of project start up
Annual Progress Report (APR) and Project Implementation Report (PIR)	PIU IFAD		Annually
Tripartite Review (TPR) and TPR report	Steering Committee PIU IFAD		Every year, upon receipt of APR
Steering Committee Meetings	Project Coordinator IFAD		Following Project IW and subsequently at least once a year
Mid-term Evaluation	PIU IFAD External Consultants (i.e. evaluation team)	USD 20,000	At the mid-point of project implementation.
Final External Evaluation	PIU, IFAD External Consultants (i.e. evaluation team)	USD 25,000	At the end of project implementation
Terminal Report	PIU IFAD External Consultant		At least one month before the end of the project

[40] The system was designed and developed by Jacopo Monzini and Professor Massimo Gherardi. It is in use in 7 GEF funded project implemented by IFAD and it had been tested over the past 6 years in 9 different countries.

225. Day to day monitoring of implementation progress will be the a responsibility of the PIU, based on the annual work plan and its indicators. GEFTF intervention will be fully blended with IRFSP operations and monitoring and evaluation system. The project will include gender expertise, and will adopt a gender-sensitive monitoring and evaluation system, providing disaggregated information by gender and age.

226. The PIU will fine-tune the progress and performance/impact indicators of the project during the inception workshop, when specific targets for the first year of implementation, progress indicators, and their means of verification will be agreed. These will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the annual work plan. Targets and indicators for subsequent years would be defined annually as part of the internal evaluation and planning processes undertaken by the PIU.

227. Measurement of impact indicators related to additional and gloibal benefits will occur according to the schedules defined in the inception workshop. The measurement of these will be undertaken through subcontracts or retainers with relevant institutions, or through specific studies that are to form part of the projects activities, or periodic sampling.

228. Periodic monitoring of implementation progress will be undertaken by IFAD. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

229. In line with GEF requirements, the Project will adopt criteria for its monitoring systems, which are SMART - Specific, Measurable, Achievable and Attributable, Relevant and Realistic, Time-Bound, Timely, Traceable and Targeted. These are duly reflected in the project logical framework. A part of the participatory M&E will be devoted to ascertain the extent of women's participation in programme activities, constraints faced, benefits gained, aspirations met and impact on women's status in the family, their involvement in community affairs and the climate-proofing of their agriculture.

REPORTING

230. A **Project Inception Workshop** (IW) will be conducted with the full PIU, MNP, MOA, ANAU and relevant government counterparts, co-financing partners (OFID), IFAD and representation from the GEF as appropriate. A fundamental objective of the IW will be to help the PIU understand and take ownership of the project’s goals and objectives, as well as finalize preparation of the first annual work plan on the basis of the project's strategic results framework (SRF). This will include reviewing the SRF (indicators, means of verification…), providing additional details as needed, and finalizing the Annual Work Plan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project.

231. Additionally, the purpose and objective of the Inception Workshop (IW) will be to: (i) detail the roles, support services and complementary responsibilities vis à vis the PIU; (ii) provide a detailed overview of IFAD-GEF reporting and monitoring and evaluation (M&E) requirements, with particular emphasis on the Project Implementation Reviews (PIRs) and related documentation, the Annual Progress Report (APR), as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the PIU on IFAD project related budgetary planning, budget reviews, and mandatory budget rephasings.

232. The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and decision-making structures will be discussed again, as needed, in order to clarify each party’s responsibilities during the implementation phase.

233. A Project Inception Report will be prepared immediately following the IW, including a detailed First Year/Annual Work Plan divided in quarterly time-frames detailing the activities and progress indicators that will guide implementation during the first year. This Work Plan will include the dates of specific field visits, support missions by IFAD or consultants, as well as time-frames for meetings of the project's decision making structures. The Report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 months time-frame.

234. The Inception Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of all partners. A section will

be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may effect project implementation.

235. The Annual Progress Report (APR) is an IFAD requirement and part of central oversight, monitoring, and project management, to reflect progress achieved in meeting the Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnership work. The format of the APR is flexible but should include the following:

- An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome
- The constraints experienced in the progress towards results and the reasons for these
- The three (at most) major constraints to achievement of results
- AWP and other expenditure reports
- Lessons learned
- Clear recommendations for future orientation in addressing key problems in lack of progress

236. The Project Implementation review (PIR) is an annual monitoring process mandated by the GEF. It has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from ongoing projects. Once the project has been under implementation for a year, a Project Implementation Report must be completed by IFAD together with the project. The individual PIRs are collected, reviewed and analysed by the steering committee (SC) prior to sending them to the focal point at IFAD headquarters. The PIRs are then discussed in the GEF Interagency Focal Area Task Forces in or around November each year and consolidated reports by focal area are collated by the GEF Independent M&E Unit based on the Task Force findings.

237. As and when called for by IFAD, the PIU will prepare Specific Thematic Reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the PIU in written form by IFAD and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learned exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered. IFAD is requested to minimize the call for special Thematic Reports (given that there are some of these already included in the workplan), and when such are necessary, will allow reasonable timeframes for their preparation by the PIU.

PROJECT PUBLICATIONS

238. The project will support the preparation of a number of awareness raising printed materials, knowledge dissemination publications and tecnhical reports that will be available online and/or as hard copies. Printed copies will be disseminated during field work, conferences, through mailing, etc, and will also be available at the PIU and MoA.

EVALUATION

239. **Mid-term Evaluation**: An independent Mid-Term Evaluation will be undertaken at the end of the second year of implementation. The Mid-Term Evaluation will take the form of a qualitative study to determine the progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on: (i) the effectiveness, efficiency and timeliness of project implementation; (ii) will highlight issues requiring decisions and actions; and (iii) will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term, including the revision of indicators if needed. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The ToR for this Mid-term evaluation will be prepared by IFAD.

240. **Final Evaluation**: An independent Final Evaluation will take place three months prior to the terminal review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The ToR for this final evaluation will be prepared by IFAD.

Annex 2 - Logical framework

Sustainable Land Management for Increased Productivity in Armenia

Objective hierarchy	Key performance indicators[41]	Means of verification	Risks and assumptions
Goal – *to enhance the overall resilience of rural communities living in risk-prone areas of Armenia*	20% increase in income for target population based on VCs resilient to land degradation and climate-risks by the end of the Project. 5% reduction in the prevalence of malnutrition for children in target populations by end of Project.	National statistics. UN and International Agencies reports.	
Objective – *to increase income and assets generated by smallholder farmers through investments in sustainable land management systems and technologies*	At least 1,630 ha are being managed and restored using new SLM practices. At least 8,000 (80%) beneficiaries are more resilient thanks to SLM introduced practices (resilience index calculated on the basis of results indicators for components 1, 2 and 3).	M&E system and evidence-based data/remote sensing. Midterm and final evaluations compared to baseline data. Results and impact management system (RIMS) and Land Degradation-Tracking-Tool.	Global market crisis worsen (R). National policies and incentives to support the agriculture sector remain in place (A). Governmental policies on sustainable agriculture, desertification and CC adaptation are improved (A).
Outputs	**Key performance indicators**	**Means of verification**	**Risks and assumptions**
Component 1 – Investments in Sustainable Farming Systems benefiting from rehabilitated irrigation infrastructure			
Outcome 1.1 – *Investments in sustainable fruit tree farming systems for increased productivity in marginal lands*	1,500 farmers increase productivity through improved irrigation and sustainable farming technologies. 30% increase in agroforestry areas with diversified fruit trees.. Proportional increase in inputs efficiency by reduction of: (a) cost of inputs; (b) water consumption; (c) energy costs; and (d) post-harvest losses by at least 50% of beneficiaries.	Midterm and final evaluations compared to baseline data. Reports and documents. Feedback from beneficiaries and concerned stakeholders. National statistics.	All stakeholders, public, private and civil society, keep alive their interest and willingness to take part in the participatory planning process (A). Smallholder farmers are empowered and supported in grant development (A). National and Global markets for high value crops (e.g. fruits and nuts, vegetables, honey) experience a downturn (R).

[41] Performance indicators will be identified during the detailed design phase.

Outcome 1.2 Efficient land and water management practices for crop diversification and food security adopted by women groups	At least 30% of women-headed households have increased 50% yields from diversified high value vegetable crops. Annual gross revenue of targeted women groups has increased by 50%.	Field surveys. National statistics. Monitoring and midterm and final evaluations compared to baseline data.	Local women and young unemployed are willing to embark in developing value chains of ecological restoration by-products (A). The project is capable of provide adequate TA and investment (A).
Component 2 – Community-led land degradation prevention through landscape restoration interventions			
Outcome 2.1 – *Ecosystem services supporting agriculture production are restored in the target areas*	Increase of fertility and ecosystem services (pollinators, water, vegetation covers) of about 880 ha of natural ecosystems in the target areas. Positive change in the ecosystem vulnerability index (e.g. Nº of hectares with reduced erosion based on RUSLE).	Field surveys. Monitoring and midterm and final evaluations compared to baseline data. MoA data.	Local stakeholders understand the value of ecological restoration for the improvement of farmland productivity and livelihoods, and are willing to participate in achieving this outcome (A). The project is capable of provided all the needed support, TA and equipment in a timely fashion (A).
Outcome 2.2 - *Complementary value chain of high quality by-products resulting from landscape restoration developed by farmers' group*	Wild and sustainable product value chains (e.g. honey and bee products) increase their productivity by at least 25%. Positive change in income generated by production and sales of wild products (at least 20%).	Field surveys. National statistics. Monitoring and midterm and final evaluations compared to baseline data.	Local women and young unemployed are willing to embark in developing value chains of ecological restoration by-products (A). Progress continues on Armenian regulations governing markets and certification of organic products, such as honey, EMAP (A). Rural exodus by landless young people increase significantly (R).
Component 3 – Enabling environment to enhance capacity of smallholder farmers against land degradation			
Outcome 3.1 - *The capacity of key practitioners to adopt sustainable land management practices and technologies is upgraded*	Demand for advisory assistance on SLM farming systems and technologies in targeted zones has increased at least 50%. 50% of women and young unemployed cooperatives supported by the project become autonomous.	Midterm and final evaluations compared to baseline data. MOA data.	The project is capable of provide adequate TA and investment (A). Rural exodus by landless young people increase significantly (R).
Outcome 3.2 - Policy processes for SLM in Armenia are enhanced	Number of implementation decrees issued in the field of SLM and NRM.	Midterm and final evaluations compared to baseline data. MOA data.	Progress continues on Armenian regulations governing sustainable agriculture (A). Firm commitment and cooperation of MOA and all other relevant gov. institutions to the process (A).

Annex 3 - Project cost table

(See Attached File)

Annex 4 - References

1) Ahouissoussi, N. et Al. (2014) Reducing Vulnerability of Armenia's Agricultural Systems to Climate Change. World Bank Studies. Washington, DC: World Bank. doi:10.1596/978-1-4648-0147-1.
2) Akopian, J.A (2009) Crop wild relative conservation on the plot 'Flora and vegetation of Armenia' of the Yerevan Botanical Garden. Electronic J. of Natural Sciences, 2(13): 3-7.
3) Akopian, J.A. (2010) Ex-situ conservation of wild pear (*Pyrus L., Rosaceae*) species at the Yerevan botanic garden, Armenia. BGCI, Vol 7, Nº 1.
4) Alaverdyan, A. & J.E. Houston (2004) Water Users Associations in Armenia: Current situation and future trends. Western Agricultural Economics Association Annual Meeting, Honolulu, Hawaii
5) Avetisyan, S.S. (2010) Agriculture and food processing in Armenia. Limush Pub. House. Yerevan.
6) Commission on the Status of Women, 2008.
7) Christmann, S. & A.A. Aw-Hassan (2012) Farming with Alternative Pollinators: An Overlooked Win-Win-Strategy for Climate Change Adaptation. AGEE Agriculture, Ecosystems and Environment 161.
8) Darbinyan, N. (2011) Organic agriculture in Armenia. In: Willer, H & Kilcher, L. (Eds) (2011): The world of organic agriculture. Statistics and emerging trends. IFOAM.
9) FAO (2010) Women in Agriculture. Closing the gender gap for development, 2010-2011 http://www.fao.org/publications/sofa2010-11/en/
10) FAO (2012) Assessment of the agriculture and rural development sectors in the Eastern Partnership Countries. The Republic of Armenia. EU Neighbourhood Programme.
11) Ghazaryan, H. Gh. (2013) Brief outline of soils in Armenia. Proceeding the Economic Dimension of Land Degradation, Desertification and Increasing the Resilience of Affected Areas in the Region of Central and Eastern Europe (EDLDIR-2013).
12) Global Institute of Sustainable Forestry (2009) Sustainable Forestry Manual, Republic of Armenia. CEPF.
13) Henry, M. et Al. (2012) Foraging success and survival in honey bees. Sciencexpress Report. http://www.sciencemag.org/content/early/recent
14) Kremen, C. & A. Miles (2012) Ecosystem Services in Biologically Diversified Versus Conventional Farming Systems: Benefits, Externalities, and Trade-Offs. E&S Ecology and Society 17 (4).
15) Lentini, P. E. et Al. (2012) Supporting Wild Pollinators in a Temperate Agricultural Landscape: Maintaining Mosaics of Natural Features and Production. Biological Conservation 149 (1): 84-92.
16) Lord, W.G. The status of honey marketing, honey quality and quantity, and the beekeeping industry in Armenia. USAID and the DAI-ASME Project.
17) McGuire, Patrick E. (2009). Elements of a National Strategy for Management and Use of Plant Genetic Resources in Armenia. Sustainable Agriculture in Central Asia and the Caucasus No. 3. ICARDA-CAC/FAO
18) Melkonyan, A. (2014) Environmental and socio-economic vulnerability of agriculture sector in Armenia. Science of the Total Environment 488-489 (2014)
19) MNP (2002) National Action Programme to Combat Desertification in Armenia.
20) MNP (2006) Third National Report on the Implementation of the UNCCD in Armenia.
21) MNP (2014) Fifth National Report of the Republic of Armenia to the CBD.
22) MNP (2015) Third National Communication to the UNFCCC.
23) MOA (2008) National report on the State of Plant Genetic Resources in Armenia
24) Nalbandyan, A. (2002) Prospects of utilization of non-wood forest products in Armenia. In: Harvesting of Non-Wood Forest Products Conference. Joint FAO/ECE/ILO Committee on Forest Technology, Management and Training.
25) Oxfam (2013) Assessing vulnerability to prioritise interventions: lessons from a South Caucasus village.
26) Oxfam. Policy paper on gender mainstreaming of agriculture related strategies Based on gender mainstreaming of 2012-2015. RA Tavush social- economic development program.
27) Pywell, R F. et Al. (2012) Wildlife-Friendly Farming Benefits Rare Birds, Bees and Plants. Biology Letters 8 (5): 772-775. A Common Pesticide Decreases
28) RAEDP Programme Completion Report, October 2010
29) RAEDP Project Performance Assessment IFAD Independent Office of Evaluation June 2012.
30) Spittlehouse D. L. (2005) Integrating climate change adaptation into forest management. The Forestry Chronicle 81 (5): 691-695.
31) Tumanian, R. (2006) Country pasture/forage resources profile, Armenia. FAO.
32) Ulander, E. et Al. Adaptation to climate change impacts in forests and forestry of Armenia – Piloting selected adaptation measures in forest regeneration and forest rehabilitation to enhance the resilience of mountain forests to climate change. UNDP-GEF-00051202 Project.
33) Urutyan, V (2007) Market assessment and development for organic grown produce in Armenia. 106th seminar of the EAAE.
34) UNECE (2002) National Report on the State of the Environment in Armenia.
35) Urutyan, V. et al (2015) Country Report: Armenia. Agricis Trade
36) WB (2007) Integrating Environment into Agriculture and Forestry Progress and Prospects in Eastern Europe and Central Asia, Volume II ARMENIA Country Review
37) WB (2012) CC and Agriculture Country Note, Armenia.
38) Yu, W. et Al (2015) Toward Integrated Water Resources Management in Armenia. Directions in Development. Washington, DC: World Bank.

Annex 5 - Terms of Reference GEFTF Project Coordinator

The IFAD/GEF initiative based on No objection of IFAD, RAED PIU Director upon consultation with MNP will recruit a full time expert, with a strong background on SLM, land degradation and climate-risk, to undertake the duties of Project Coordinator. S/he will be based in the PIU. S/he will take lead and responsibility for the delivery of the IFAD/GEF initiative under the overall supervision of the PIU Director and will ensure direct coordination with the stakeholders of the overall GEF project at the central and community level. Her/his specific duties will include:

- Take overall responsibility and leadership on the planning, implementation and monitoring of the GEF project. This entails the preparation and monitoring of AWPB, and the supervision of all the service providers and experts hired by the project.
- Manage the project in accordance with its annual work plans, coordinate the GEF project activities on a regular basis, and ensure complementarities with the baseline IRFSP project.
- Propose selection criteria, organization of announcements and requirement and supervise national and international consultants/subcontractors, maintaining strong quality control and providing advisory support as required.
- Maintain close coordination/linkages with all technical implementation partners (governmental agencies, municipalities, media companies, private service providers and NGOs).
- Oversee the design and establishment of channels for regular project information dissemination, sharing, and networking among stakeholders' communities (from local to national levels).
- Facilitate, monitor and supervise the process of selection of grantees, and the set up of key project outputs and tools, including the Training programmes.
- Supervise the procurement of goods and services, sends payment requests for IFAD No Objection. Prepare ToRs and conditions for grant applicants, sends them for IFAD No Objection. Organise biddings. Lead the selection process of the grant applications through field review and final scoring by the Application Evaluation Committee.
- Work closely with PIU, IFAD, MNP and key stakeholders to coordinate the overall implementation of project activities.
- Oversee the needs assessment and provision of required training and capacity building of involved stakeholders; coordinate and facilitate all the steps of the mainstreaming process and monitor progress in legislation and governance improvement.
- Lead responsibility for the organization of project-related meetings, seminars, conferences, and workshops.
- Provide support and guidance for the gathering of data and information needed to undertake an effective monitoring and evaluation of all the activities included in the IFAD/GEF initiative.
- Prepares and sends to GEF national focal point agency all needed reports and documents.

The candidate should have a minimum of 10 years of experience with the following skills and knowledge or minimum 5 years agro ecological grant based proven successful national project coordination work experience the last is a strong asset:

- A first degree in a discipline related to Agriculture or Natural Resource Management. A postgraduate degree would be an advantage.
- A strong background in and working experience on climate change adaptation for sustainable rural development.
- A good knowledge of agroecology and development-related policies and legislation in Armenia is an asset.
- Familiarity and strong proven experience in the implementation of development projects (Project management, M&E, good managerial and technical skills).
- Good knowledge of the different national and local stakeholders concerned with agriculture, resources management, rural development, and climate change, including government and administration, private sector, civil society and international development partner agencies, and strong ability and readiness to communicate, and work with them.

- Ability to work in a multi-sectoral context and communicate effectively with other disciplinary specialists.
- Have the ability to supervise team members and service providers.
- Oral and written fluency in English is a strong asset.

Annex 6 – Atlas Describing Target Areas

(See attached file)