

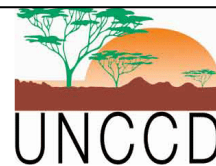


REPUBLIC OF ARMENIA

Land Degradation Neutrality National Report



This report summarizes the key outcomes of the national efforts carried out in 2014 and 2015 towards putting in practice the land degradation neutrality concept. The LDN project, which was sponsored by the Republic of Korea, was carried out with the support of the UNCCD Secretariat and implemented in partnership with the Joint Research Center of the European Commission and CAP 2100 International.



LDN NATIONAL VOLUNTARY TARGET AND STRATEGY

LDN national target:

- By the year 2040, the carbon stock lost between 2000 and 2010 will be recover and increase by 2,8% in relation to present.

Means to achieve LDN national target

1. Stop cropland degradation and apply agro ecology (conservation + modern “organic” technology). Currently, about 2/3 of all agricultural lands are at different stages of degradation. The reasons are clear: first of all because the small allotments owners do not apply modern methods of cultivation, crop rotation is not very often, incorrectly applied fertilizers, irrational use of pesticides, lack of irrigation water, the abundant use of artesian water, causing secondary salinization of soil, among other causes. In the next 10 years, a pilot project will be undertaken to promote among local people their conversion to "organic agriculture" technology, in particular to the widespread use of manure, compost and others as fertilizer,. The country has already implemented projects to build reservoirs to collect and use rainfall water as a source of water for irrigation during dry season. Additionally, wide technical support will be undertaken on the rational use of land resources. It is expected to expand the rate of agricultural areas under permanent crops.
2. Reforest 2/3 of the degraded land. The "Armenian Forest Program" expects to increase the area of forested areas to 20.1% of the total national territory till the end of century. The program includes reforestation, afforestation of degraded areas, improvement of degraded forests, the transformation of mono-specific (artificial) forests into full-fledged natural forest ecosystems.
3. Stop deforestation and improve forest management in 100% of national territory. Currently, the country started the work on the elaboration of new management plan for all forestry enterprises. In these plans “High value forests” should be marked out for special conservation, fully taking into account the possible consequences of global climate change and measures will be enforced towards sustainable use of forest resources.
4. Stop overgrazing and improve grassland management in 100% of national territory. The country launched a number of pilot projects to inventory the practices of grazing throughout Armenia, recalculate grazing norms and adequate grazing regulations to different environmental conditions and different degrees of pastures degradation, through the development of management plans for use of grasslands for fodder conservation and grazing.

Key Features of Armenia

Date of creation: 23.09.1991	President of the Republic: Serzh Sargsyan
Total area: 2,974.300 ha	Cultivated area: 481.500 ha Natural area: 1,990.000 ha
Population: 3,017.100	GDP: 10,43 billions US\$
Urban population: 1,914.100	HDI: 0,729 (2012)
Rural population: 1,103.000	

Critical Processes and Their Corresponding Key Drivers

In the “National Strategy and Action Program to Combat Desertification in the Republic of Armenia” (2015) desertification factors are divided into two groups: natural and anthropogenic. Natural factors include: droughts that are frequent at Ararat valley and some areas of Vayots Dzor and Syunik regions; Sandstorms are frequently observed in Ararat valley, Vayots Dzor and Syunik regions; Moisture deficit caused by unequal distribution of seasonal and regional rainfall; Geomorphological features; Landslide processes; Floods; Naturally occurring salinization. Anthropogenic factors include: Urban development; Agriculture practices related to the violation of ploughing rules, absence or inappropriate application of crop rotation techniques, ineffective use of irrigation water and nutrients, overgrazing of pastures; Road construction; Illegal logging; Mining, especially with open-pit method; Abuse of artesian water resources; Soil contamination.

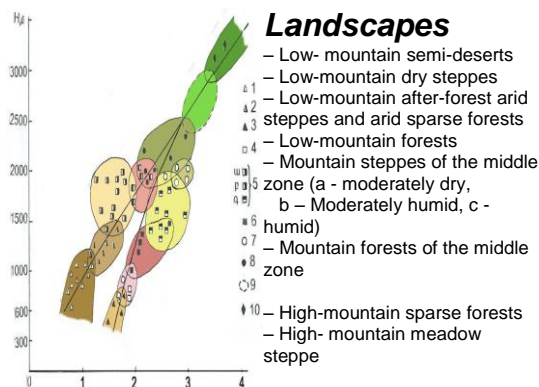
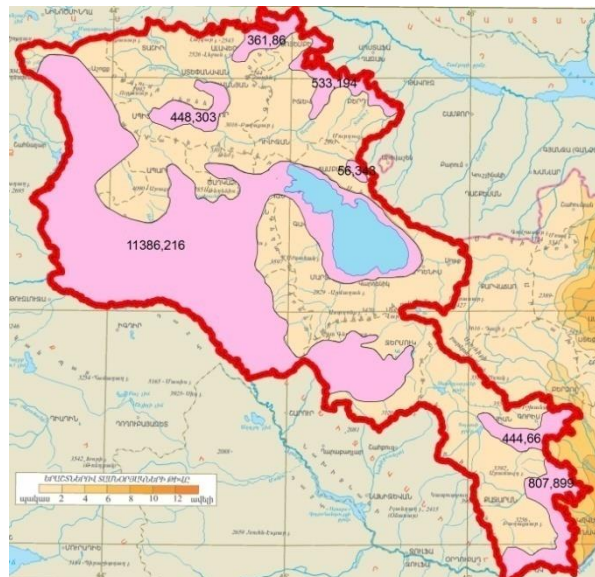
Critical processes in Armenia identified by the project are rather intensive in Armenia.

Water erosion at various stages listed on nearly half of all forestland in all forest regions of Armenia (186200 ha). Likewise, it is registered in almost half of all cropland in all regions of the country (220000 ha), except orchards and vineyards. Wind erosion observed in small cropland areas in the Ararat plain - 22000 ha. The area of eroded land increased in 10 years (2000-2010) by 20000 ha.

Artificialized land for 10 years has increased by 27230 has and is now about 3.5% of the total area of Armenia.

Pollution by radioactive substances in Armenia doesn't exist, however, the chemical pollution is registered on 272000 ha, polluted by minerals on 300200 ha, with most of the land contaminated by mineral substances used in agriculture, and by chemicals - in urban areas. Biocides pollution is expressed slightly (just 4700 ha). Contamination by chemicals has practically not increased, because in recent years the chemical industry in Armenia has collapsed. Pollution by minerals has increased due to the relative low cost and incorrect application of chemical fertilizers, especially nitrate. Increasing the area of contaminated land takes place in all rural areas of the country.

The process of acidification is not intensified in Armenia and mainly associated with natural soil properties. Salinization especially intensified in recent years. Particularly secondary salinization occurs at Ararat valley, where artesian water is widely and abundant used for irrigation. Currently, the area of secondary salinization reached 27000 ha. Improper use of agricultural machinery with improper irrigation methods led to the appearance of compaction on large areas - almost half of all agricultural land is currently in various stages of compaction. These areas are slowly but steadily increasing (in Ararat valley during the period 2000-2010 there was an increase in the area 2000 ha). Areas prone to overgrazing has not increased in recent years, but the consequences of overgrazing in the past have not been eliminated, and such land is now up about 170,000 hectares. The processes of deforestation in recent years have practically stopped, on the contrary, in recent years, and in the future it is planned reforestation and afforestation of non-forest areas in the area of at least 200-300 ha per year until 2030.



Drought areas of the Republic of Armenia (indicated in violet) and Elevation dependent change of aridization coefficient

Studies of the structure of the vertical zonation of the landscapes of the Republic of Armenia suggest that the spectra of the north-eastern, south-eastern and internal areas of the mountain landscapes significantly differ from each other. Two landscape-ecological ascending zonality series can be separated based on heat and humidity ratio differences. North-eastern and partially south-eastern portions of the Republic are characterized to be mezofit, while the central areas are ecological series of xerophyte landscapes. This character of the structure of the upland zoning is an important landscape-geophysical phenomenon peculiar to landscape aridity. The analysis of the elevation dependant change in the coefficient of aridization of the area shows that 2 distinguishable landscape series can be separated in the landscapes of the Republic which are typical for all arid mountain countries. In the northern, north-eastern and partially south-eastern portions of the country mezofit series are formed which include lowland after-forests, arid steppes, arid sparse forests and forests, middle zone mountains, forest humid steppes and steppe meadows, highland mountain trans-alpine and alpine meadows. Xerophyte series is peculiar to the rest of Armenia's inner regions and includes lowland semi-deserts and dry steppes, mountain temperate-arid and humid steppes, sparse forests, meadow steppes of the middle zone, high-mountain trans-alpine and alpine meadows, as well as nival landscapes.

NATIONAL LAND MANAGEMENT PLAN

A) Summary tables

Table 1 - Presentation of national basic data using the LDN indicators framework

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Table 2. Target setting

Negative trends	Area (sq km)	Corrective measures	LDN target		Investments required (M USD)
			Area (sq km)	Time (year)	
Reduction of the areas of forest land	54,8	Afforestation, reforestation and improving of forest stands	37,5	2050	70
Decline in the quality of grassland used as pastures	160	Elaboration of new grazing norms and management plans for pastures	160	2040	20
Decline of soil productivity in croplands	200	Adoption new strategy for agriculture development and elaboration and implementation projects for modern technologies using	200	2040	100
Increasing of bar lands	5	Afforestation of bar lands	10	2030	20
Total			407,5		210

BRIEF DESCRIPTION OF THE LND ACHIEVEMENT STRATEGY

As stated above, the main goal of the LDN strategy, proposed for the period until 2040, is to reestablish the loss of soil organic carbon in the period from 2000 to 2010, and an increase of carbon sequestered by 2.8%. To achieve this goal, the following actions will be taken.

Improvement of legislation in the process of combating desertification is consistent with the 2nd operative objective of the strategy of the "Convention to combat desertification...", which implies creation of favourable conditions for decision-making concerning mitigation of land degradation and drought consequences and harmonization of legal basis targeted at sustainable land use. The following actions are planned for 2015-2020: Elaboration of draft law on "Legal regime of areas exposed to desertification"; Elaboration of draft law on changes and amendments in RA Land Code; Elaboration of draft law on "Strategic planning of environmental issues"; Elaboration of draft law on making amendments and supplements in RA Law on "Environmental education and upbringing of population"; Elaboration of draft law on "Economics of ecosystem services".

Improvement of land used for crop production. The most important tasks here are the increase in irrigated areas using modern technologies, such as drip irrigation; restoration of drainage system and limiting the use of artesian water for irrigation when it leads to secondary salinization of lands; increase awareness of the population engaged in agricultural production; introduction of modern agricultural methods (crop rotation, zero tillage, soil amendment, drip irrigation, keyline design, hedgerow growing, etc.); expansion of areas under permanent crops; comprehensive expansion of application of agro-ecology and "organic" agriculture; restoration of severely degraded lands and the use of abandoned areas improvement of agricultural product's market.

The expansion of forest plantations on degraded lands. One of the most important tasks should be afforestation of unused agricultural land, especially severely degraded, on soils with very low soil fertility. In most cases, it is necessary only to conduct afforestation and maintenance of irrigation water, especially in the first years after planting trees, it also requires the use of modern irrigation methods including drip irrigation. In addition, it is necessary to implement measures to restore degraded forests, including areas affected by massive cuts in the nineties of the last century. In most cases, these areas are currently engaged in low value coppice stands or shrubs. In this case, it is necessary to transform these ecosystems in the high value forest ecosystems.

Improved forest management and termination of deforestation. At present, almost all over the country the processes of deforestation stopped. It is necessary to design and enforce in all forestry enterprises rational forest management plans, which will, on the one hand, significantly improve the condition of forest ecosystems and increase the level of carbon stocks, on the other hand, would allow foresters and forestry enterprises to receive a steady income without harming the ecosystem, and the thirdly would better preserve forest biodiversity.

To improve the condition and proper use of grasslands. Currently, more than half of all grassland ecosystems that are used as pastures and hayfields, are in various stages of degradation, caused both overgrazing and undergrazing. Correct, science-based management of pastures and hayfields will improve the conditions of natural ecosystems, increase the stock of carbon sequestered, will enable efficient use of plant resources, will improve the opportunities for the development of animal breeding. At the same time to improve the condition of pastures, besides choosing the right pasture capacity, it is necessary to implement modern measures to improve greatly degraded overgrazed pastures, including pastures' rest, artificial nitrification, implementation of rotational grazing system. It is necessary to organize a proper system for watering animals in the grazing field, to avoid overloading pastures with too many animals and trampling ecosystems and compacting soil in water reservoirs vicinities. In some cases, when the degradation has reached the extreme steps, it is possible to transfer such pastures to land intended for afforestation.

LDN CENTERED NAP SWOT ANALYSIS

SWOT Analysis was conducted during the project National Land Degradation Neutrality Commitment implementation. National Action Program was elaborated according the order of the Ministry of Nature protection of Republic of Armenia, it was adopted by Government of RA 27.05.2015 (N 23).

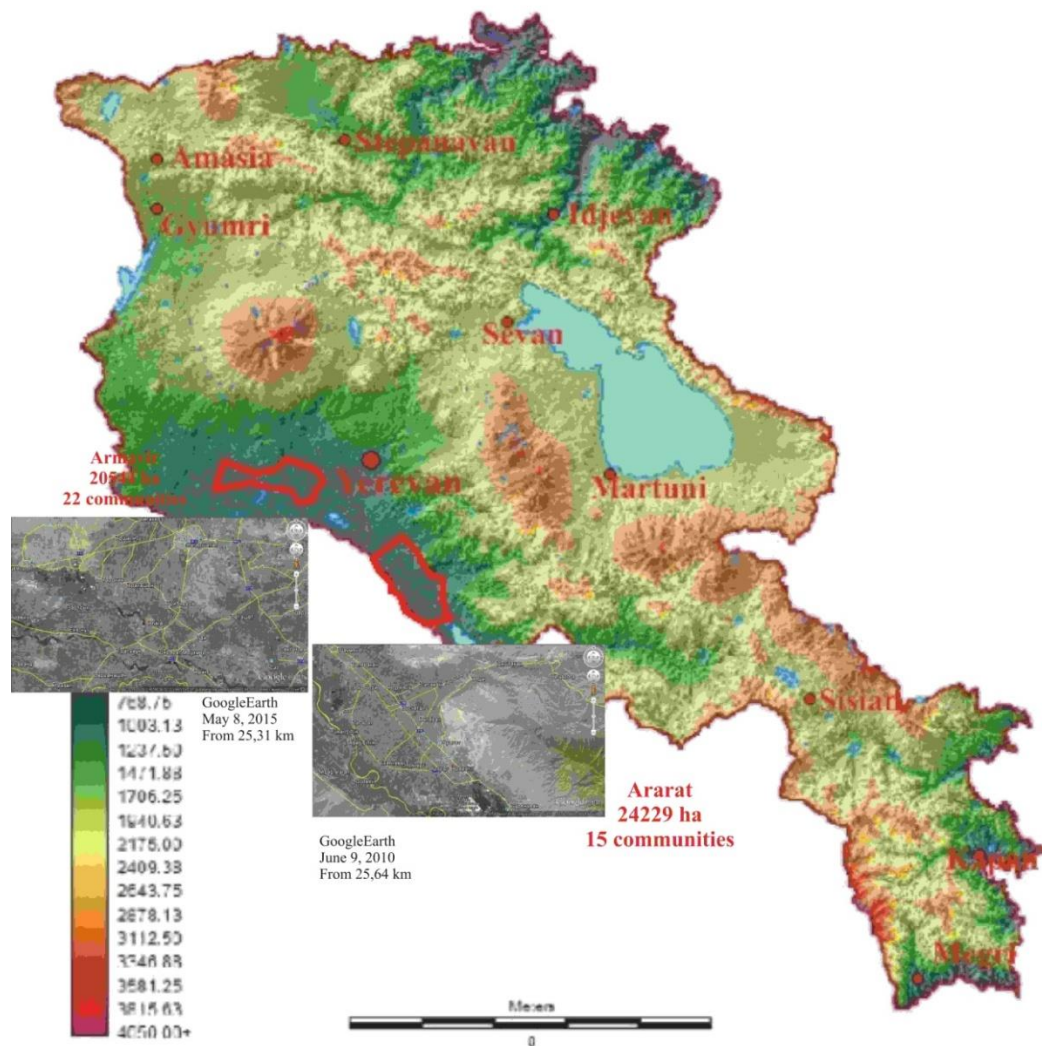
The NAP is worked out for the period 2015-2020. For this very short period only the first steps of action are provided. This phase includes improvement of legislation, improvement of management system, ensuring of public awareness and participatory activities, and joint activities within Rio conventions (Climate and Biodiversity) and international cooperation.

The NAP should be the main instrument in the implementation the LDN Strategy and all its activities.

The SWOT matrix

STRENGTHS <ol style="list-style-type: none"> 1. Short term for implementation of the NAP (2015-2020) 2. Clearly identified directions of NAP 3. Specified needs in the direction “Improvement of legislation” 4. Two activities in the direction “Ensuring of public awareness and participatory activities” are well formulated and are easy to implement 	WEAKNESSES <ol style="list-style-type: none"> 1. Very general specifications in the direction “Improvement of management system” 2. Very limited activities in the direction “Ensuring of public awareness and participatory activities” 3. Very limited activities in the direction “Joint activities within Rio conventions and international cooperation” 4. Very general formulations in the direction “Joint activities within Rio conventions and international cooperation” 5. Absence of long-term activities (maybe activities started in 2015-2020 will continue further)
OPPORTUNITIES <ol style="list-style-type: none"> 1. NAP is approved by Government of Republic of Armenia who is fully committed to implement it. Sources from National budget and Private sector (payer pollutant principle) have to be allocated for some activities of the NAP’s implementation. 2. Activities are well formulated and it will be rather easy to find financial sources for them from international organizations 3. Developed infrastructure for NAP implementation (scientific organizations, governmental bodies, Non-governmental organizations, etc.) 	THREATS <ol style="list-style-type: none"> 1. Lack of financing in the state budget connected with economical crisis 2. Lack of awareness of beneficiaries on activities relating to national programs and in the project design and management 3. Beneficiaries’ indifference or weak involvement in projects elaboration and implementation. Awareness raising and wide promotion campaign are the only real exit from this situation. 4. Possible delays in the elaboration of draft legal acts, discussions and approval procedures of the project

National Map of Selected LDN Hotspots



Two hotspots were selected in Armavir and Ararat regions of Armenia, both in Ararat valley, and both have more or less similar problems with land degradation and desertification. The main problems are lack of water for irrigation, decrease of land productivity, secondary salinization of soil as result of abundant using artesian waters for irrigation.

Special projects are developing to solve these problems in the pilot regions.

1. Addressing the lack of water for irrigation by introduction of drip irrigation in perennial plantations (orchards and vineyards) in the area of 2500 ha in two pilot regions. The project cost approximately USD 1200000 with perennial drip irrigation systems.
2. The solution to the problem of lack of water for irrigation in the Armavir pilot region in the village Apaga and nearby communities on an area of 800 ha. Repair and rehabilitation of irrigation network with modern pumping systems. The cost is estimated at 40,000 USD.
3. Addressing the decline in soil fertility under annual crop through extensive use of organic nutrients (manure, compost, manure processed by red Californian worm). The area is 7000 ha. The project involves the purchase and delivery of organic fertilizers from other regions of Armenia, where is a well-developed animal husbandry, and manure accumulates in large quantities. Approximate project cost is 2,000,000 USD.
4. Reducing the risk of secondary salinization by limiting from the use of artesian water for irrigation and repairing drainage system. For a small part of the villages of Ararat pilot region (5 villages) the problem will be solved after the commissioning of the Vedi reservoir (scheduled for 2020). The remaining problems can be solved through the construction of small reservoirs, which in the spring will be collected water from melting snow and rainfall. The project cost is not yet calculated.

WHO WILL DO WHAT, WHERE AND WHEN

In combating desertification and achieving LDN targets in Armenia main role should belong to the Ministry of Nature Protection and the Ministry of Agriculture. Ministry of Nature Protection should coordinate and plan envisaged main activities of the National Programme of Action, to attract specialists for the development and implementation of planned activities, to search the necessary funds and deal with the involvement of national and international donors. In addition, the Ministry of Nature Protection should develop management plans for specially protected natural areas, and to monitor their implementation, which should help to maintain and improve the condition of ecosystems and significantly increase the amount of carbon permanently sequestered in them. Expanding the network of protected areas in many cases will restore degraded ecosystems, like forests, grasslands and wetlands.

The Ministry of Agriculture should play the primary role in the implementation of measures for improving the condition of forest ecosystems, which belong to the SNPO "ArmForest." In the coming years the main task of the activities should include the evaluation the results of ongoing pilot projects and implement the experience gained throughout the country. This range of problems concerns the development of modern forest management plans as well. These plans have to be elaborated on ecosystem approach and include measures for conservation of High conservation value forests, sustainable use of forest resources, improvement of degraded forest ecosystems, etc. In addition, according to the "Forest program of Armenia" optimal forested area of the republic should be 20.1% of the territory. So, in the long term it has to be afforested about 200 thousand hectares of non-forest land. That is in addition to the main objectives of improving the condition of existing forest ecosystems, it is necessary to evaluate existing areas of unused agricultural land, highlight areas that cannot be used in agriculture anymore without special very expensive actions, for example, because of the hard erosion or extremely low soil productivity, economic inefficiency for fertility restoration, to assess the possibility of their afforestation and implement the necessary measures. In the field of grassland ecosystems, improvement of pastures and hayfields should be primarily based on the evaluation of the results of pilot projects implemented in the republic. Then it is necessary to disseminate best practices to the entire territory of the republic. Furthermore, it is necessary to extend the action to raise awareness of both the impact of land degradation and desertification and the goals and objectives of the LDN program, as well as to raise public awareness about modern methods of agriculture and forestry ("organic" agriculture, drip irrigation, crop rotation, zero tillage, soil amendment, keyline design, hedgerow growing, agro-forestry, transformation of mono-silvicultures in full standing forest ecosystems, etc.).

Obviously, the low GDP in Armenia will not allow to carry out all necessary activities from the state budget only. Therefore, it is necessary to attract various national and international environmental organizations and donors. For this item the Ministry of Nature Protection and Ministry of Agriculture should develop special programs to attract international donors (grants and loans) for providing necessary funding for implementing the actions included in the LDN program.

If we assume that the LDN program can be designed for up to 25 years, then in the next 10 years, we need to implement pilot projects in at least two regions of the country. In the course of implementing this program two regions in Ararat and Armavir regions of Armenia were selected. For these pilot regions the conditions of the land were assessed, and the priorities of the necessary steps to prevent the land degradation outlined. The ideas of 4 pilot projects for these 2 regions are proposed above, it is necessary to identify possible (national and international) sources of funds for their implementation.

LEGAL REGULATORY FRAMEWORK THAT WILL BE PUT IN PLACE TO ENABLE THE ACHIEVEMENT OF THE LDN TARGET

There are different laws, governmental decrees and regulations that concern the problems of desertification. The most important is the Republic of Armenia Land Code (2001). After its adoption RA government adopted decision N 26 (January 14, 2002) on “Establishing authorised bodies in the sphere of national management of land resources”. The system of the authorised bodies (Ministry of Agriculture, Ministry of Urban development, Ministry of Industry and trade, Ministry of Nature protection, Ministry of Energy and Natural resources, Ministry of Transport and Communication, Ministry of Healthcare, Ministry of Culture, Ministry of Defence, State Committee of the Real Estate Cadastre, State Property Management Department, State Committee of Water resources) and the scope of their authorities, as well as the list of legal acts ensuring the implementation of the Land Code were established.

The RA “Mining Code” was adopted on November 28, 2011 and entered into force on 1st January 2012. The Code provides a number of provisions relating to the protection of lands. The Code provides for the concept of post-mining land restoration which assumes restoration measures aimed at the recovery of disturbed lands for conserving the nature and the environment envisaged by the design of extraction of minerals or geological exploration program. Decision N 1192-N adopted by the RA government on August 18, 2011 sets monitoring methodology of industrially polluted soils. Governmental decision N 1396-N adopted on September 8, 2011 regulates the factors related to efficient and purposeful use of the fertile soil layer, particularly the responsibilities of landowners and land users, jurisdictions of community heads and governors, counting and recording of data on removal, storage, transportation and use of the fertile soil layer.

According to the National Program of Action to Combat Desertification during the first five years (2015-2020) great attention must be paid to the improvement of the legal framework. In this aspect, the most important role in the development of new laws and changing existing should belong to the Ministry of Nature Protection and the Ministry of Agriculture. During this period, they should develop three new laws and prepare amendments to the existing two. In particular it should be developed RA Law "Legal regime of areas exposed to desertification", in which must be included a set criteria and legal regime of areas prone to desertification, and introduce a system of tax exemptions and compensation; RA Law "Strategic planning of environmental issues", in which has to be included the defining of main principles for strategic planning; RA Law "Economics of ecosystem services", in which the regulation of interrelations associated with economics of ecosystems has to be included. As well amendments to the RA Land Code, in which the implementation of land pollution state monitoring has to be ensured and necessary provisions on land cover classification system has to be introduced, and the RA law "Environmental education and awareness rising of population", in which clarification of roles and responsibilities of state bodies and public awareness rising should be developed.

In the case of these legislative initiatives LDN program will have a real legal support, and the reality of its full implementation will be largely enhanced.

THE LDN MONITORING, REPORTING, EVALUATION AND VERIFICATION SYSTEM THAT WILL BE PUT IN PLACE

All activities related to the implementation of the LDN strategy should be coordinated by the Ministry of Nature Protection of Armenia, in particular, responsible person for all of these programs should be Focal point of the Convention to Combat Desertification.

Under the leadership of the Focal point the system of monitoring should be established. It is very important that Armenia will be integrated in the International network of LDD part of which has to be established in the Caucasus. This system should be organized in two levels. The first level for tracking changes in the situation with land degradation and desertification throughout Armenia will be based mainly on data obtained from official government statistical service. These data should be specified during independent surveys, by data provided by member organizations of the National working group, by data obtained from satellite imagery. These data must be obtained and analyzed each year. The second level - monitoring the implementation of concrete actions at the beginning of the pilot projects, followed by targeted programs in different areas of the country. Data collection, analysis and coordination should be in the hands of Focal point of the Convention. From this perspective, monitoring standards are the following:

- a. envisaged period for the implementation of each activity;
- b. compliance of implementation of activities with its objectives;
- c. cost of financial means allocated for the implementation of each activity annually;
- d. reports on the implementation of each action in defined deadlines and format;
- e. level of involvement and share of implemented activities of stakeholders in implementing actions.

As support to ordinary monitoring soil restoration surveys have to be organized, and system of soil degradation alerts has to be established.

Reporting on all activities and situations related to LDN programs should be submitted to the Secretariat of the Convention to Combat Desertification, according to their requirements on a regular basis. The corresponding reports must also be passed to the Ministry of Nature Protection of Armenia according to the requirements and provisions of the Republic of Armenia.

Evaluation and verification should be carried out under the leadership of the Focal point of the Convention first of all by the members of the National working group. The results of these actions must be used as the basis for all reports submitted to the Convention Secretariat and the Ministry of Nature Protection. It would be very desirable to regularly, at least once every five years, to assess and involve into verification of the data independent experts. This will reveal the failures and shortcomings in the implementation of both pilot projects and targeted programs. Independent experts can be recruited from Armenia and from abroad. Financing of independent experts should be from additional sources.

THE BUDGET AND FINANCING STRATEGY

Now when the National Action Program to Combat Desertification adopted by the Government of the Republic of Armenia, the financing of projects and programs within it must be of the sources proposed in it. For the majority of actions as a source of financing the state budget is indicated, or any sources not prohibited by RA legislation. In general, it is assumed that the strategy to combat desertification - is a national task, and the key role for its implementation should belong to the state. Unfortunately, the GDP and the state budget of the Republic in the coming years will not be able to ensure full implementation of most programs aimed at combating desertification and implementation of the targets of LDN. Therefore, it is necessary to attract additional sources of funding and, above all, money from international sources (including possible carbon credits for Armenia). The following can be considered funding sources for action program to combat desertification in Armenia including projects and programs concerning LDN problems:

1. state and community budgets of the Republic of Armenia
2. investment of factories, foundations, non-governmental organizations and other organizations
3. International sources.

Financing of the project implementation can be organized at the expense of above-mentioned separate funds, as well as in combination.

Risk factors, their possible impacts and necessary prevention activities in the implementation of National Action Plan

Risks	Results	Mitigation or prevention activities	Responsible entities
Lack of financing	Project is not being implemented	A) allocation of appropriate resources from the state budget B) negotiation with donors	RA Ministry of Nature Protection, RA Ministry of Finance
Lack of awareness of beneficiaries on activities relating to national programs	Failure of organization of participatory process to combat desertification	Awareness raising on objectives, planned activities and expected results of action plan	RA Ministry of Nature Protection, mass-media (by agreement)
Beneficiaries' indifference or weak involvement in project implementation	Project does not serve to its objectives	Awareness raising on social-economic impacts of desertification	RA Ministry of Nature Protection
Delays in elaboration of draft legal acts, discussions and approval procedures of the project	Hampering the process of combating desertification	Establishment of responsible entities involved in elaboration of draft legal acts and discussions and preparation of the timetable	RA Ministry of Nature Protection



LDN working group was organized at the Ministry of Nature protection of Armenia.

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The report was prepared by LDN Country consultant (Dr. G. Fayvush) with participation of working group members and under supervising of UNCCD Focal point in Armenia – Ashot Vardevanyan