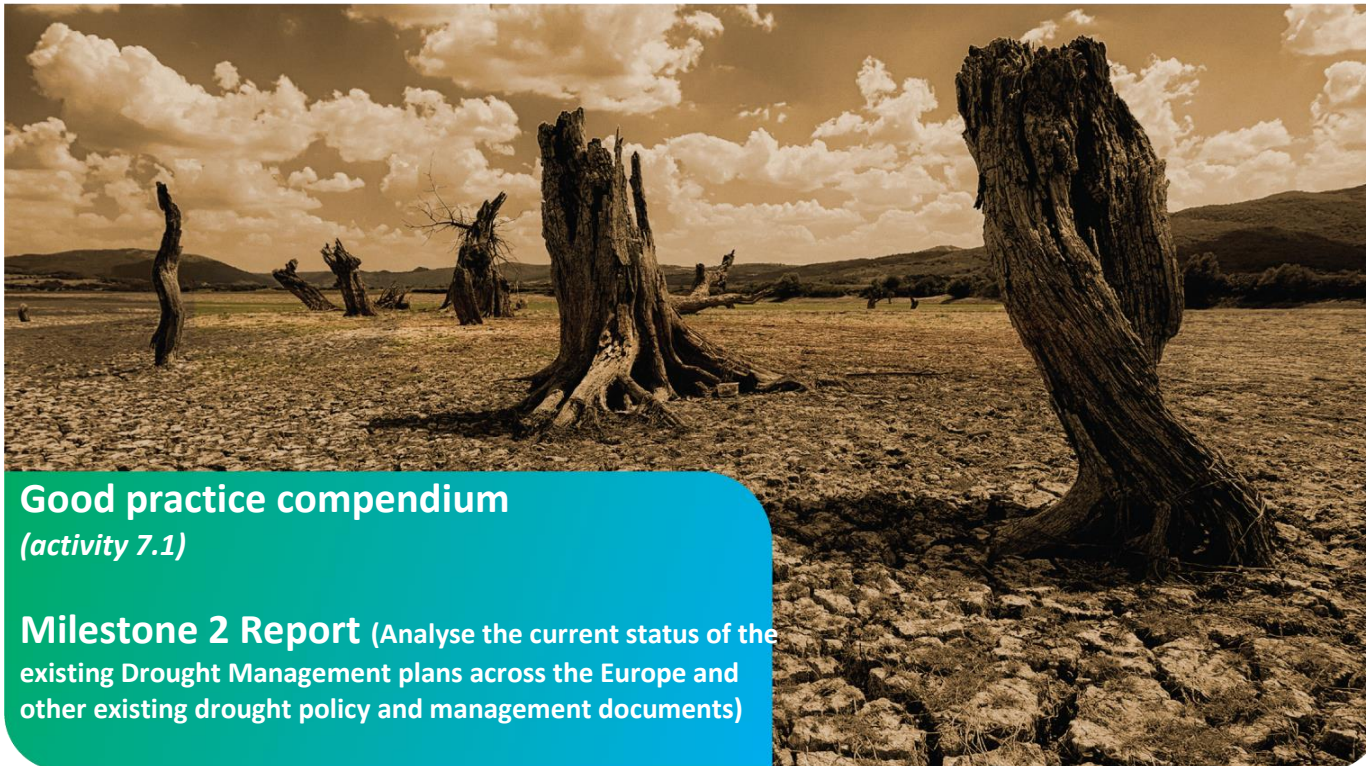


# Integrated Drought Management

## Programme in Central and Eastern Europe



**Good practice compendium**  
(activity 7.1)

**Milestone 2 Report** (Analyse the current status of the existing Drought Management plans across the Europe and other existing drought policy and management documents)

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July, 2014

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## Preface

### About the Convention

Desertification, along with climate change and the loss of biodiversity were identified as the greatest challenges to sustainable development during the 1992 Rio Earth Summit. Established in 1994, UNCCD is the sole legally binding international agreement linking environment and development to sustainable land management. The Convention addresses specifically the arid, semi-arid and dry sub-humid areas, known as the dry lands, where some of the most vulnerable ecosystems and peoples can be found. In the 10-Year Strategy of the UNCCD (2008-2018) that was adopted in 2007, Parties to the Convention further specified their goals: "to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas in order to support poverty reduction and environmental sustainability".

The Convention's 195 parties work together to improve the living conditions for people in dry lands, to maintain and restore land and soil productivity, and to mitigate the effects of drought. The UNCCD is particularly committed to a bottom-up approach, encouraging the participation of local people in combating desertification and land degradation. The UNCCD secretariat facilitates cooperation between developed and developing countries, particularly around knowledge and technology transfer for sustainable land management.

As the dynamics of land, climate and biodiversity are intimately connected, the UNCCD collaborates closely with the other two Rio Conventions; the Convention on Biological Diversity (CBD) and the United Nations Framework Convention on Climate Change (UNFCCC), to meet these complex challenges with an integrated approach and the best possible use of natural resources.

Link: <http://www.unccd.int/en/Pages/default.aspx>

In existing review we are presenting Drought Management plans across the Europe and other existing drought policy and management documents besides Drought Management plans of European countries. For Drought Management plan we are using another synonym which is more common, **National Action Plan**.

## **The Drought Management Center for South-Eastern Europe – cornerstone of drought management in the region**

In the decades the drought-related damages in the region of South-Eastern Europe (SEE) have had large impact on the economy and welfare, mainly reflected in destroyed crops and devastated farmlands. The vulnerability to drought impacts in SEE is higher in comparison to neighbouring regions and according to IPCC findings, it will become worse. Preparedness – especially drought monitoring, planning, plan implementation, and proactive mitigation-must become the cornerstone of national drought policy. DMCSEE (Drought Management Center for South East Europe) in now forward-looking stance to reduce regional vulnerability to the impacts of drought.

Since the DMCSEE was established in 2006, much of its focus has been on improving drought monitoring within the region of SE Europe. Experience with drought monitoring provides a knowledge base for informing effective approaches to prepare for and respond to droughts. DMCSEE tries to coordinate development and application of drought monitoring, risk management tools with the goal of improving preparedness and reducing drought impacts. It introduces and continues to provide now missing regional information on drought situation. Since definitions and thresholds for drought differ on country/region levels today, the partnership agreed upon an integrated approach combining outputs of meteorological services. Using common methodology in drought analysis and impact assessment the project obtains regionally comparable results enabling better overview of drought situation. DMCSEE also has a six year history of international activities. In fact, its international involvement is increasing, in collaboration with national hydrometeorological services and other drought/water related research institutions and water resource management agencies at national/regional and global scale including international bodies like World Meteorological Organisation (WMO), United Nations Convention to Combat Desertification (UNCCD), Joint Research Centre of the European Commission (JRC), UN agencies like United Nations Strategy for Disaster Reduction (UNISDR) and non-governmental agencies like Global Water Partnership (GWP) will lead towards improvement of global drought target-setting. However, in order to implement programmes and projects at smaller scales, there is the need to develop capacities of local authorities and communities and promote linkages with stakeholders and broader authorities.

Some general outputs from DMCSEE trans-national integrated approach (Transnational Cooperation Project) in the period 2009-2012 supported by EU regional development fund will be presented. Results of project could serve to support effective national/regional drought policy.

More information about DMCSEE available at: <http://dmcsee.org/>; Meteorological Office, Environmental Agency of Republic of Slovenia ([andreja.susnik@gov.si](mailto:andreja.susnik@gov.si); [gregor.gregoric@gov.si](mailto:gregor.gregoric@gov.si))

Some DMCSEE facts:

- Drought Management Center for south-eastern Europe (DMCSEE) was established in 2006;
- DMCSEE was founded as a link among regional initiatives with 13 founding countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, FYROM, Greece, Hungary, Moldova, Montenegro, Romania, Slovenia, Turkey, Serbia & 2 founding agencies (World Meteorological Organization (WMO) & United Nations Convention to combat Desertification (UNCCD));
- DMCSEE is a program funded by the Slovenian government hosted by Slovenian Environment Agency in Ljubljana;
- DMCSEE adopts a networking and interdisciplinary approach to the changing nature of drought appearance in the region with much of its focus on improving drought monitoring within the region of SE Europe;
- Governance and organizational matters agreed with founding countries;
- Management bodies: International Steering Committee (ISC), consortium, participatory process of permanent representatives with the WMO, UNCCD focal points and drought researcher;
- Working procedure outlines in Terms of reference;
- ISC members rotation (rules agreed by countries).

# 1. National Action Plans

## 1.1 Northern Mediterranean (Greece, Italy, Portugal, Turkey, Spain, Slovenia)

### Greek National Action Plan for Combating Desertification

Link: <http://www.unccd.int/ActionProgrammes/greece-eng2001.pdf>

Athens, January 2001

28 pages

Agriculture is the biggest consumer of water (83%) in our country. Desertification of large areas is one of the macro-factors, which effect the water balance. Today, this phenomenon has become a real threat, it is necessary that all responsible agents, governmental and non-governmental, contribute toward the implementation of a well-documented, integrated and effective National Action plan for combating desertification. In the strategy of the Greek Government for the primary sector of the economy and the rural development, the infrastructure and the water resources play an important role. The Government, being aware of the seriousness of the phenomenon of desertification, takes all the necessary measures for combating it at national and local levels, seeking always the consent and the co-operation of the involved agencies.

#### Contents

- Desertification Factors in Greece (Climate, Physiography, Geology, Soil, Hydrology)
- Desertification Processes in Greece (Reduction of rootable depth, Reduction of available water, Soil chemical degradation)



- General measures to prevent and mitigate desertification (Determination of the threatened areas, Information and awareness, Agencies for the implementation and monitoring of the measures, Land use planning, Financial Sources, International Co-operation, Selection of pilot areas, Restoration of desertified areas, Research, Legal and institutional measures)
- Measures concerning the agricultural sector (Current situation, Soil Erosion control, Facing drought conservation of soil water, Facing secondary salinization of irrigated soils, Implementation of the proposed measures, Research)
- Measures concerning fauna (Current situation, Protection from over grazing)
- Measures concerning the stock-raising sector (Current situation, Protection from over grazing)
- Measures concerning the water resources sector (Current situation, Institutional measures, Measures for irrigation, Measures for urban and industrial water use, Measures for increasing available water, Research)
- Measures concerning the socio-economic sector (Socio-economic measures against desertification)
- General instructions for the implementation of the action plan (Integrated approach, Temporal and Spatial Programming of measures and actions, Synergies with the UN Conventions on climate and biodiversity)
- Main issues

### **General instructions for the implementation of the action plan**

The measures described in the various chapters of this document will be implemented in the framework of integrated projects by considering all the relative parameters in each of the threatened areas and by involving all stakeholders and necessary disciplines.

The measures and actions are to be taken in the following sequence:

- Development of a general policy and strategy for combating desertification
- Development of the necessary legal and institutional framework
- Securing the necessary funds
- Promotion of public awareness
- Adoption of incentives for the stakeholders
- Exact demarcation of the affected zones
- Initial implementation of the Action Plan in the pilot areas designated in the present document



- Design and application of detailed local projects
- Evaluation of results and updating of both the local projects and the National Action Plan
- Implementation of the National Action Plan throughout the affected zone, all around Greece

## **Italy - National Action Programme to combat drought and desertification**

Rome, December 1999

Link: <http://www.unccd.int/ActionProgrammes/italy-eng2000.pdf>

10 pages

The Inter-Ministerial Committee for the Economic Planning (CIPE) in accordance with a lot of pre-decisions approved the National Action Programme.

The priority sectors of the regional programs are: soil protection, sustainable management of water resources, reduction of environmental impact from productive activities, land restoration.

The Guidelines identify the following possible measures for information, training and research:

- Development of public-information programs by government offices;
- Promotion of information campaigns by public and private enterprises and associations through accords with government offices;
- Survey of research activity in Italy on drought and desertification;
- Analysis and evaluation of strategies to prevent and combat drought and desertification;
- Study of the causes and processes of desertification and the evolution of the phenomenon in Italy;
- Evaluation of the environmental, social and economic implications and consequences of drought and desertification;
- Development of research programs in association with the international scientific community and international programs;
- Dissemination of know-how and new acquisitions in scientific research;
- Scientific and technical support for government offices;

- Extensions of information to the other countries in the Mediterranean Basin;
- Support for strengthening the clearing-house mechanism;
- An inventory of traditional know-how and technologies aimed at reproducing them with modern techniques.

The strategies which have been identified by the Italian Development Cooperation to combat drought and desertification in developing countries are aimed at:

- Cooperation with the affected countries and coordination with donor countries, providing technical and financial support for the preparation and implementation of National Action Programmes. In order to avoid waste of the available resources, Italy's actions will target a limited number of countries selected in the basis of the experience and knowledge acquired and taking into account the programs presented at the conferences of the parties to the UNCCD;
- Management of development cooperation activities in coordination with the bodies of the Convention, making use of national scientific resources. The Overseas Agricultural Institute (IAO) will act as coordination centre for research institutes in consultation with the Environment Ministry;
- Support: for regional institutions, CILSS, IGAD, and OSS, whose members are located in particularly hard-hit areas; for international bodies like the FAO, IFAD, and OMM, to which Italy is one of the major donors, including the enhancement of the Italian presence within those agencies; for NGOs, whose collaborative efforts within NAP must be experimental in nature and serve to consolidate and gain the participation and consensus of local communities;
- Orientation of anti-desertification efforts, in accordance with UNCCD principles, towards sustainable economic and social development. Environmental recovery efforts are closely linked to problems of employment, production diversification, and market-oriented production. These efforts will adopt integrated approaches aimed at achieving a balance between development and conservation of natural resources, as well as take into account aspects associated with reducing poverty, migrations and exodus due to natural causes.

Financial coverage for government assisted development measures comes from optimised utilisation of already allocated resources, also exploring new sources and systems of financial support. It is planned to maintain the level of voluntary contributions to agencies which are particularly active in combating desertification unchanged, targeting these contributions towards sustainable-development objectives in arid lands. New funds may be allocated to assist regional agencies.

## **Portugal - National Action Programme to combat desertification**

17.6.1999

Link: <http://www.unccd.int/ActionProgrammes/portugal-eng1999.pdf>

11 pages

Focal Point: dgf.web@mail.telepac.pt

### **Contents**

- Introduction
- Desertification in Portugal – Diagnosis of the Current Situation
- Strategic Objectives of the National Action Programme to Combat Desertification
- Strategic Objectives
- Specific Objectives
- Axes of Intervention and Operational Guidelines (Soil and Water Conservation, Keeping the Working Population in Rural Areas, Recovery of Areas most Threatened by Desertification, Research, Experimentation and Diffusion, Ensuring that Desertification is included in Development Policy)
- Implementation, Monitoring and Assessment
- Sensitive areas to desertification

The international community has long recognised that desertification is one of the most serious problems facing the planet, since it has clear social, economic and environmental implications. Since desertification as a phenomenon is strongly influenced by human activity, it is up to the human race to take measures to ensure that, especially in high-risk regions, any process leading to desertification starts, the internal re-feeding

mechanism will intensify the phenomenon and it is only with great difficulty that original conditions can be naturally restored. Desertification is thus a reality that depends on human and natural factors (drought and climate variation).

Man-made factors leading to the phenomenon of desertification are fundamentally the ones that lead to alterations to the microclimate, such as destruction of plant cover and dispersed trees, incorrect soil use, overgrazing, unsuitable irrigation techniques, salinization, demographic pressures on risk areas, etc...

This phenomenon has consequences in Portugal, above all in the eastern and southern interior, which have been seriously affected by soil erosion resulting from incorrectly chosen crops and unsuitable farming practices, as well as the occurrence of periods of intense rainfall in short time periods. However, we should also not overlook water and wind erosion as important factors in desertification, since these are relevant questions in some regions of the country. This is a complex process, in which the causes are sometimes mistaken for the effects, and in which it is not only the nearest agents that intervene, but also many others which are not directly involved and may often escape identification. The most widespread manifestation of the cause-effect issue in desertification in Portugal is depopulation.

National Action Programme to Combat Desertification should be understood as a tool offering guidance for action, especially bearing in mind its objectives when formulating measures and policy instruments for sustainable economic and social development.

In a first attempt to identify the areas which display the conditions most likely to encourage desertification, and then to territorialise the question of the susceptibility of Portuguese soils, three indices were defined, each one of them reflecting different forms of action of different factors in the process of desertification. The indices used were as follows: climate index, soil loss index, drought index.

By combining the three indices, it has been possible to construct an index of susceptibility to desertification which shows the spatial distribution of the phenomenon throughout the Portuguese mainland. The index of susceptibility to desertification was obtained using the climate, soil loss and drought indices, using Geographic Information Systems (GIS). The results obtained using this method allowed for a territorial distribution of the degree of susceptibility to desertification, highlighting the regions which, due to their climatic, edaphic and physiographic features and their plant cover, had already stood out in the component indices. Comparison of the various socio-economic indicators with the results obtained and with the identification of the regions of the country more susceptible to desertification validated overall the methodology applied.

Despite the fact that, nationally speaking, the methodology shows the areas with greater susceptibility to desertification, it still needs to be validated at regional level. On the other hand, it is acknowledged that the use of the climate index (as defined by UNEP) in characterising desertification processes, is a limitation on the methodology developed, since it does not reproduce the vulnerability of soils to climatic “stress”. In this context, and without prejudice to the general validity of the results already obtained, work is being developed to make the index discrete using the number of months in which precipitation and water content in the soil do not compensate for the evaporating power of the atmosphere. This new approach requires identification of the sites where the water deficit is not set right artificially by man-made means.

The National Action Programme to Combat Desertification envisages the following five strategic objectives: soil and water conservation; to fix working-age population in rural areas; recovery of affected areas; campaigns to raise public awareness of the issue of desertification; making the fight against desertification an integral part of general and sectorial policy.

Bearing in mind the general direction of the strategic objectives established in the National Action Programme to Combat Desertification, the following specific objectives have been defined: regional, rural and local development; organisation of the agents for economic and social development; agricultural activity; forestry; recover degraded areas; water resources management policy; concerted research; centres and demonstration fields; information and public awareness.

The guidelines for the implementation of the National Action Programme to Combat Desertification derive from the strategic objectives adopted, and also from their being part of a framework which is being applied world-wide by the United Nations Convention to Combat Desertification and Drought.

At the national level, the strategy for action necessarily includes the development of partnership among government bodies and NGOs, with the aim of involving people directly in discussion of the question of desertification and the solutions to be adopted in each concrete situation.

Assessment of the progress and difficulties in applying and developing the National Action Programme to Combat Desertification is absolutely essential to its success. In this context, monitoring and assessment of the policy measures and the territory require the definition and application of suitable procedures, both regarding compilation and systematisation of relevant information and concerning the production of quantitative and qualitative indicators which will make it possible to analyse how the situation has evolved. A National Desertification

Observatory working closely with the National Committee to Co-ordinate the Combat against Desertification will make it possible to ensure monitoring and assessment of the programme's implementation.

## **Turkey's National Action Program on Combating Desertification**

Ankara, 2006

Link: <http://www.unccd.int/ActionProgrammes/turkey-eng2006.pdf>

20 pages

Contact: [eozevren@yahoo.com](mailto:eozevren@yahoo.com)

As the consequence of internationally increased concern on global land degradation, it was finally recognized that desertification is an important problem all around the world, particularly in African countries, in terms of economical, social and environmental aspects. To prevent this process which threatens the welfare and the future of humanity, some measures were taken by the United Nations. The first Conference on Environment, in Stockholm in 1972, was the turning point on this matter and was followed by the Conference on Desertification held in 1977. The “Action Plan to Combat Desertification” approved by the Conference was a pioneering and one of the most leading international initiatives on combating desertification and drought.

The Intergovernmental Negotiation Committee was established by the United Nations Environment and Development Conference (UNCED) in 1992 to prepare the Convention. The United Nations Convention to Combat Desertification was adopted on 17 June 1994. 17 June was therefore declared as the Day of Combating Desertification. The Convention was empowered on the 26<sup>th</sup> of December 1996 with 191 countries as parties of the Convention as of June 2004.

The preparation and implementation of the National and Regional Action Programmes is the most crucial international responsibility of the parties. The main purposes of the National and Regional Action Programmes are in particular: determining priorities of the countries related to desertification and drought; contributing to regional efforts; promoting cooperation among stakeholders; increasing public interest on desertification; integrating development plans and strategies at all levels; promoting participation of all related institutions, civil society organisation and local people; allocating financial resources for implementing activities etc.



The geographical location, topography and climatic conditions as well as the long standing history of the country is the cause of the high magnitude sensitivity exerted on the issue of desertification and drought. Turkey signed the Convention on 15 October 1994 in Paris. It has been approved in 1998 with the law numbered 4340, published in the official gazette on 16 May 1998. Turkey is in the North Mediterranean Regional Implementation Annex (Annex IV) and participates to regional activities such as subject-specific projects and/or regional work programs.

The National level Convention related services and international communication and coordination are being provided by the Ministry of the Environment and Forestry. For this reason, as well as for monitoring international activities and achievements, the Ministry has established a special unit, the “Directorate of Combating Desertification” at its central organisation, under the Afforestation and Erosion Control General Directorate.

As a result of the efforts carries out by all related institutions under the leadership of the Turkish Soil Science Society and by the coordination of the Ministry of Environment and Forestry, the Turkish National Action Programme (NAP-TR) to Combat Desertification was completed in 2003 (Minister of Environment and Forestry, Osman Pepe).

## **Contents**

- Introduction
- Definitions, principles, approaches and objective
- Desertification risks in Turkey (Topography and Erosion)
- Desertification in Turkey
- Approaches and principles towards establishing the framework of sustainable land management
- Measures to solve problems on natural resources management
- Methods, Tools and Criteria to prevent desertification and reduce its effects

Turkey has been Part of the Convention since 1998 and takes place in the North Mediterranean Regional Implementation Annex (Annex IV) as a country affected from desertification. Turkey has also participated to several regional and cooperative programs and projects connected with this Annex with the other countries in the regional namely Greece, Italy, Portugal and Spain.

Because of the richness of its natural resources, Anatolia has been a multi-cultural civilization since the Neolithic. The overuse of the land without sustainable planning has caused the occurrence of degradation eventually leading, to a reduction in productivity, and even to the loss of the soil. The degradation of the natural vegetation on the sand dunes of the Eastern Mediterranean in the 1960s has caused the extinction of several endemic plant species. Moreover, agricultural lands and villages were threatened by the movement of the sand dunes.

The most relevant approach to develop strategies and design activities to combat desertification and drought is the preparation of National Action Programmes, which take into account specific dynamics of the country and the Regional Action Programmes, regarding the similarities between countries in the respective region as well as the cooperative actions.

National and Regional Action Programmes aim at identifying factors which accelerate desertification, identifying priorities, setting out contribution to regional works, increasing public awareness on desertification matters, integrating development plans and strategies of countries, identifying responsible institutions and civil society organizations and allocating financial resources for desertification and drought related works.

The Turkish National Action Programme to Combat Desertification (NAP-D) is prepared under the coordination of the Ministry of Environment and Forestry through the guidance of the Turkish Soil Science Foundation. Several institutions and HGOs, interested in desertification related issues, also participated to the preparation works. In order to make the Program acceptable and applicable, it reflects the views and critics of all stakeholders.

The most suitable and adoptable proposals for action were given in the Annex of the NAP. Those include the necessary activities related to the proposals and the institutions which were officially responsible to carry out these actions upon their capacities.

The NAP was disseminated after approval to be implemented by public institutions, universities, civil society organisations, vocational institutions, local administrations, regional institutions, unions and especially beneficiaries (villagers, farmers). To make the Programme successful, it is essential that all related parties, especially rural communities, should effectively participate to the seminars, meetings,

workshops and similar activities. The Turkish National Action Programme to Combat Desertification is a tool to provide sustainability of soil resources which can be degraded easily and cannot be renewed.

## **Principles**

The main principles taken into consideration for developing the Turkish National Action Programme are as follows:

- Stating spatial distribution of desertification and its level by using scientific measures on the lands experiencing desertification/land degradation;
- Identifying ecosystems which need to be protected primarily and putting related reclamation initiatives in the agenda;
- Analyzing current environmental protection and sustainable use policies and identifying gaps and deficiencies;
- Identifying scientific, economic, social and technical criteria in new and/or additional policies on implementation approach;
- Informing the public through all kinds of publications and broadcasting for creating/increasing public awareness on desertification;
- Providing affective participation of all related public institutions, local administrations, civil society organisations, local communities and other groups at local, regional and national level to combat desertification;
- Establishing national strategies to mitigate impacts of desertification and land degradation;
- Developing sustainable land and water use, protecting biodiversity areas and preventing arising social conflicts;
- Establishing early warning systems through centralized information networks;
- Networking with other countries for information flow.

## **Spain – Programa de Accion Nacional Contra la Desertification**

August, 2008

190 pages

Link: <http://www.unccd.int/ActionProgrammes/spain-spa2008.pdf>

### **Contents**

- Objectives about the fight against desertification (objectives about programme, definitions)
- Diagnostics about the Spain situation (desertification factors in Spain, Actions of fight against desertification in Spain; Agriculture sector, Forestry sector, Rural sector, etc.)
- Proposal of Action (Elements of National policy about fight against desertification)

This programme is well prepared and also the proposals are really good presented. The programme is only in Spain languages. Translation is needed because Spain has a lot on good proposals and ideas about fight against desertification/drought and that ideas/proposals can be used also in other countries if needed.

## **Slovenia – National Actional Plan (Draft)**

November 2013, Ljubljana

Slovenian Environmental Agency and Biotechnical Faculty, University of Ljubljana

140 pages

### **Contents**

- Review of existing National Action Plans (EU, world) – Mediterranean countries, Central and Eastern countries, United States, United Kingdom
- Responsibility for drought Management in Slovenia
- Drought status in South-Eastern Europe
- Monitoring and early drought management (drought observatories, current status in Slovenia)
- Processes in drought management (past national revisions, drought in Slovenia, drought prevention, elimination of drought consequences, combination of drought actions, summary, recommendations, reduction of the sensitivity of agricultural production in drought – actions, report on the corrective actions of the Ministry of Agriculture, Forestry and Food)
- Proposal of a drought management plan
- Legislative framework (review of Slovenian drought and water laws, good practices)
- Suggestions and ideas

The draft of National Action Plan of Slovenia is written in Slovenian language and it is now in status of implementation. Slovenian NAP (draft) is a really good review of other countries and in the process of research work was established a really good proposal (figures) of responsibilities and ideas/proposals for drought management in 3 figures.

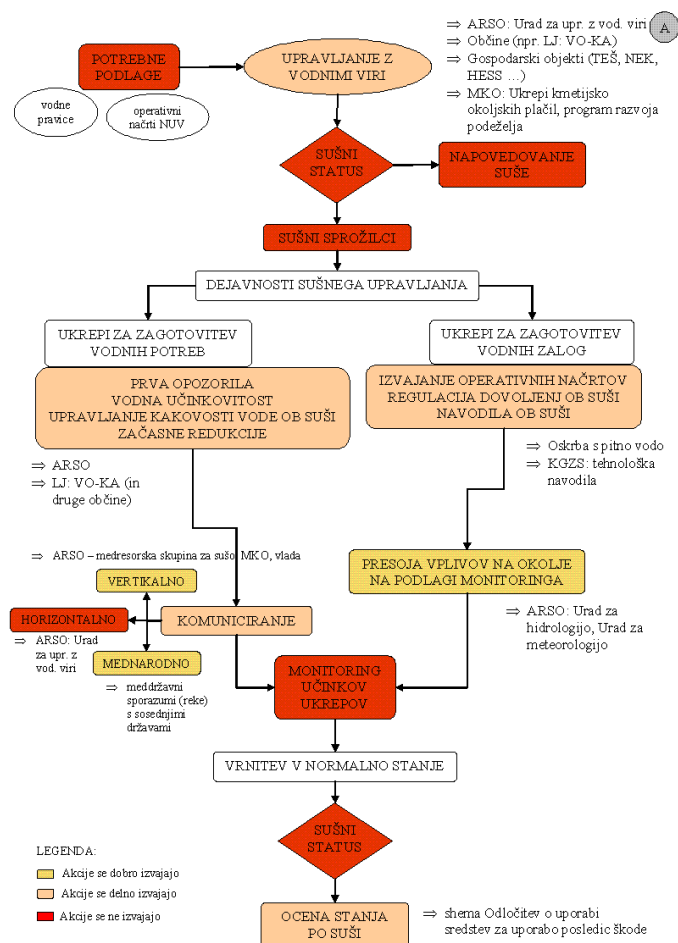


Figure A: Current Drought Management Status in Slovenia



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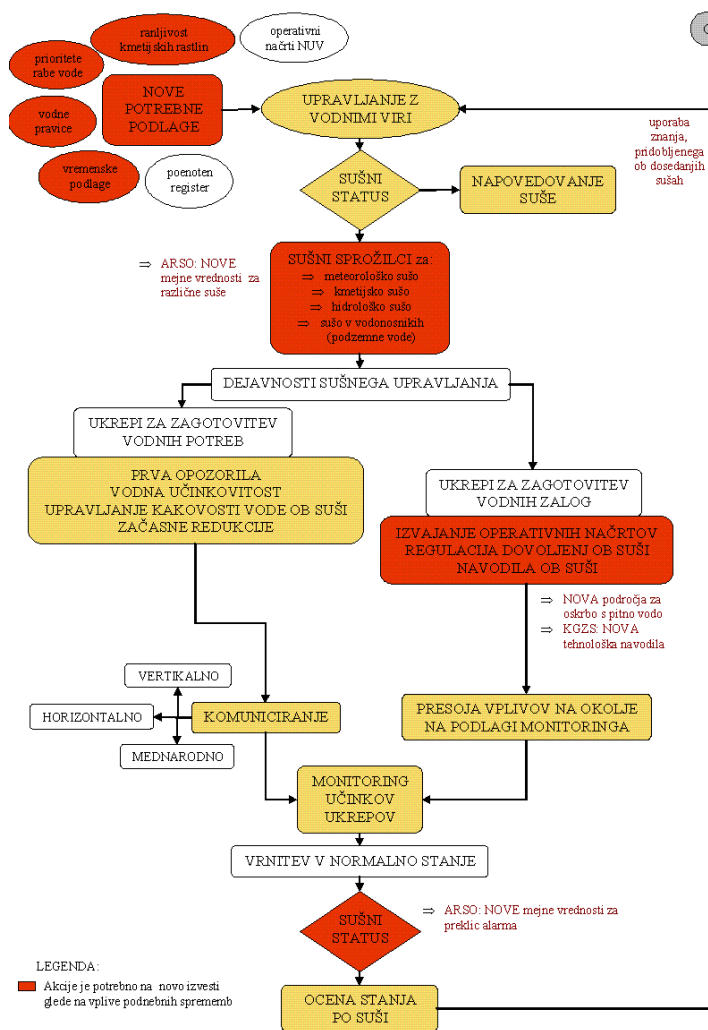


Figure C: Proposal of drought management plan for Slovenia with effects of climate change

## **1.2 Central and Eastern Europe (Armenia, Georgia, Moldova, Romania)**

### **Armenia - National Action Programme to combat Desertification in Armenia**

Yerevan, 2002

Link: <http://www.unccd.int/ActionProgrammes/armenia-eng2002.pdf>

196 pages

Combating the geological-climatic conditions Armenia is also subject to desertification and is greatly damaged, mainly due to land degradation, reduction of biodiversity and biological resources and, as a result, deterioration of social state of population.

So combating desertification is a strategical issue for republic. Mitigation and prevention of desertification is a precondition for sustainable development of the country. With UNCCD Armenia undertakes a number of international obligations where the priority is given to developing the National Plan to Combat Desertification. UN CCD being an essential achievement of Rio summit is closely related to UN Conventions on Biological Diversity and Climate Change. Armenia is a member of these Conventions as well. UN CCD is an innovation document, a new achievement in the international law on environmental protection.

Special significance is given to analysis of ecological and socio economical status of the republic, identification of executive and local authorities, land users role in combating desertification.

Essential scientific significance have the computer-based mappings, where a detailed description of environmental, including state of natural resources and features of desertification processes is presented.

#### **Contents**

- Natural and Climatic Conditions in Armenia (Geographic Description Relief, Vertical Zoning; Climate; Geological structure; Soils; Hydrology; Flora; Fauna)
- Socio-economic Conditions and Natural Resources in Armenia (Legislation in the Republic of Armenia; The Population and Settling Characteristics; Territorial Division, Settlements; General Trends of Economic Development; Social Security Issues; Industry; Agriculture; Energy Sector; Land Resources; Water Resources; Biological Resources; Mineral Resources; Specially Protected Natural Areas; Recreation; Economic Mechanisms of Nature Use)
- Desertification in the Republic of Armenia (Desertification Criteria and Factor; Peculiarities of Landscape Desertification)
- Socio-economic Consequences of Desertification (Correlation of Desertification and Economy; Economic-and-environmental Predictions for Desertification)
- Strategy Trends of Actions to Combat Desertification in Armenia (Enhancement of Legislation and Management System; Economic Development; Improvement of Economic Mechanisms for Natural Resources Management; Conventions Related Joint Actions; International Cooperation)
- The Role of Education and Science in Combating Desertification (Environmental Education Issues; Scientific Research)
- Public Participation in Combating Desertification (Provision of Public Awareness; Provision of Public Participation in Decision-making and Implementation of Actions; Public Stakeholders)
- Priority Projects of Local Importance (Recovery of Lands Subject to Desertification in the Garni Community in the Province of Kotayk of the Republic of Armenia; Goris River Non-structural Mudflow Mitigation in the Province of Syunik of the Republic of Armenia; Project for Engineering and Geological Survey of the Site of Makaravank Memorial Complex in the Tavush Province of the Republic of Armenia; Mitigation and Neutralization of Harmful Impact of the Shamlugh tail Storages in the Syunik and Lori Provinces of the Republic of Armenia)
- Mapping of Areas subject to Desertification (Methods of computer-based mapping of areas subject to desertification; Land cover; Seismic situation in Armenia; Natural fodder holdings; Forests; Landslide dangerous areas; Mudflow riskiness in river basins; Lake Sevan problem; Desertification on the territory of RA; Computer-making maps)

The following may be assumed as desertification criteria on the territory of the Republic of Armenia:

1. Trend for decrease of humidification index,
2. Increase of daily thermal fluctuations in the air and on the earth,

3. The amplitude and value of the absolute temperatures,
4. Increase of evaporation,
5. Decrease of precipitation quantity,
6. Change in the nature of soil-formation process,
7. Biodiversity reduction,
8. River flow reduction,
9. Intensification of badlanding process,
10. Growth of mudflow-generation and erosion,
11. Decrease of sowing areas efficiency and decrease of humus,
12. Intensification of human-made impact.

### **Strategy Trends of Actions to Combat Desertification in Armenia**

As a result of the analysis undertaken the problems of desertification in Armenia and reasons and factors causing them have been identified. Comprehensive measurements aimed at improvement of existing socio-economic situation in the country could essentially contribute liquidation or mitigation of the latter by including the following:

- Enhancement of legislation and management system,
- Improvement of economy,
- Enhancement of mechanisms for nature use.

The system of comprehensive measurements completely reflects the nature of international commitments, undertaken by the Republic of Armenia in different sectors, particularly on environmental conventions, such as UN Convention on Biological Diversity, UN Convention on Climate Change, and UN Convention to Combat Desertification. Given this fact the following measures are essential for termination or reduction of desertification processes in Armenia:

- Development and implementation of joint projects within the framework of the Conventions,
- Regional and sub-regional cooperation.

### **Improvement of management system**

Success of fighting desertification first of all depends on implementation of unified strategy in the field of environment. From this point major task of the state is to strengthen the mechanism for environmental management, to improve environmental planning and integrate environmental and other sectors' policy while economic reformation. Sustainable socio-economic development of population should be based upon:

- Capacity to take into account environmental priorities while preparing and making economic and other decisions;
- Conducting a unified state environmental policy;
- Study and analysis of reasons for environmental degradation interrelated by social, economic and environmental factors;
- Improvement of environmental activities within the state socio-economic policy framework and environmental management system;
- Implementation of permanent, comprehensive and universal programmes for public environmental education and training;
- Effective participation of non-governmental organisations and local population in conducting comprehensive activities for unified environmental policy;
- Provision of open, full, reliable and timely environmental information.

### **Conventions Related Joint Actions**

The UN Convention to Combat Desertification makes frequent references to sustainable development, biological diversity, water resources, climate change, energy resources, food safety and socio-economic factors. It serves a ground to conclude that actions to combat desertification should include wide-range measures targeted at efficient use of natural resources. It would contribute to reduction of the scope of soil erosion and rehabilitation of degraded lands and mitigation of draught consequences. A particular role in attaining these objectives belongs to preparation of joint action programs in the framework of international conventions and their implementation. The efficiency depends upon inevitability of compliance with the international obligations undertaken by the state.

The Republic of Armenia is currently a part of a number of conventions, including those, which are directly related to prevention of desertification phenomena or mitigation of impact consequences, such as Convention on Climate Change, Convention on Biological Diversity, Convention on Wetlands, Convention on Environmental Impact Assessment in a Transboundary Context, Convention on Transboundary Transfer of hazardous Waste and Their Disposal Control, and other conventions.

Joint projects implemented in the framework of Conventions would also enable to avoid such duplication as follows:

- Improvement of legislation,

- Capacity assessment
- Monitoring,
- Environmental impact assessment,
- Public environmental awareness raising,
- Training,
- Development of early notification system.

The Republic of Armenia has an extensive experience of international cooperation in the field of environmental protection, resulted from harmonious and efficient activity with Conventions Secretariats, UN structures (UNEP, UNDP, GEF, FAO, UNSO) and the World Bank. In the framework of such cooperation a number of strategical projects have been elaborated.

Development of regional and sub-regional cooperation is the major prerequisite for efficient improvement of measurements in the field of environmental protection, particularly the process to combat desertification, and enhancement of environmental safety principles. Its importance is also expressed in Article 11 of the UN Convention to Combat Desertification, which states that such cooperation could involve joint projects for sustainable management of transboundary natural resources, improvement of science and engineering, and adequate institutions. From this point, the first steps have already been taken to promote inter-state contacts, adequate and coordinated actions, a number of international agreements have been signed.

## **Georgia - National Action Programme to Combat Desertification**

Link: <http://www.unccd.int/ActionProgrammes/georgia-eng2003.pdf>

2<sup>nd</sup> April, 2003

34 Pages

For Georgia desertification represents not only an environmental, social or economic, but also a climatic problem. Climate warming poses a serious threat to the Caucasus glaciers, as it causes melt due to high temperature, low relative humidity and fall in solid atmospheric precipitation. In case these processes take on a systematic character, they will cause an accelerated glacier retreat and obviously lead to

serious climatic change, first local and then regional. The Caucasus ecological balance is clearly under threat, the more so if the processes become irreversible. It is anticipated that in Georgia, just like in the whole region of the Caucasus, the period up to 2050 will see a significant decrease in annual river runoff (50-150 mm/year). The effect of warming will presumably be different in western and eastern regions of Georgia. In eastern Georgia, a rise in ambient temperature over the first half of this century may reach 2°C, when in western Georgia open to the constant influence of the Black Sea it will only reach 1°C.

Although Georgia does not lie in the immediate proximity to deserts, in the event of systematic dry spells certain regions located in the eastern part of the country (Gare Kakheti, Kvemo Kartli) may confront a real danger of local desertification. In addition to these regions, there may exist other areas vulnerable to desertification, whose timely identification is important if effective action to combat desertification is to be insured.

Therefore, comprehensive study of droughts and desertification, and elaboration of a long-term strategy and plan of action to combat desertification is one of the most urgent problems for our country.

Georgia became a party to UNCCD in 1999. The creation of the National Action Plan to Combat Desertification was coordinated by the Ministry of Environment and NACRES (Noah's Ark Centre for the Recovery of Endangered Species) was designated to develop the actual document.

Georgia's National Action Programme to Combat Desertification relies on programmes developed, and opinions expressed, by the Institute of Hydrometeorology of the Georgian Academy of Sciences; the Vakhushti Bagrationi Institute of Geography of the Georgian Academy of Sciences; the V. Gulishevili Institute of Mountain Forestry of the Georgian Academy of Sciences; the Institute of Geophysics of the Georgian Academy of Sciences; the Research Centre "Stikia" for Natural Elemental Processes and Engineering geo-ecology under the State Department of Geology; the Department of Meteorology, Climatology and Oceanography of the Tbilisi State University; the Georgian Academy of Agriculture and its institutions; the M. Sabashvili Scientific Research Institute of Soil Science, Agrochemistry and Melioration; the Scientific Research Institute of Livestock Farming and Forage Production; the I. Lomouri Research institute of Farming; the Scientific Research Institute of Horticulture, Viticulture and Wine-Making; the N. Kanchaveli Institute of Plant Protection; the Scientific Institute of Radiobiology and Ecology; the Chair of Soil Science of the Georgian State Agrarian University; the Georgian State Department for Protected Areas; the Institute of Water Utilities and Engineering Ecology of the Georgian Academy of Sciences; the Ministry of Agriculture and Food of Georgia; the Ministry of Environment and Natural Resources of Georgia, as well as local government bodies.



The national plan of action to combat desertification describes general guidelines and mechanisms to be considered in future. At the same time, it does not list specific measures to be taken in every concrete case, as many of them require consistent scientific examination.

This Action Programme was supported by the UNCCD Secretariat, and the governments of Switzerland and Italy.

## **Contents**

- Introduction
- Strategic Principles
- Main Objectives
- Georgia: Brief Information on Physical and Geographic Features
- Georgia's Arid and Semiarid Regions – Areas that Are the Most Vulnerable to Desertification
- Characterisation of arid and semiarid territories
- Factors Contributing to Desertification in Arid and Semiarid Areas
- Condition of Arid and Semiarid Ecosystems
- Analysis of Anthropogenic Factors Occuring in Arid and Semiarid Areas
- Analysis of Economic Sectors
- National Plan of Action to Combat Desertification
- Economic Mechanisms to Combat Desertification
- Preserving Biological Diversity against the Background of Desertification Processes
- Raising the Public Environmental Awareness
- Monitoring Desertification
- Desertification and Agriculture

Main Objectives of the NAP to Combat Desertification are:

- identify territories under of desertification and define their areas;
- Take action to combat desertification through sustainable use of natural resources, adequate planning and conservation activities;
- Engage competent authorities and institutions in the action to combat desertification;
- Develop international cooperation and partnership in order to enhance the action to combat desertification.

National Plan of Action to Combat Desertification:

- Identification of desertification-prone territories in Georgia based on the analysis of factors and processes causing desertification, and comprehensive mapping with physical-geographic, geo-ecological and other thematic maps drawn up;
- Identification of drylands in Georgia, and evaluation of the impact of global circulation, radiation and human factors on drought occurrence processes;
- Evaluation of the impact of climatic and hydro-meteorological changes on desertification of dry lands, crop distribution and crop yield;
- Construction of physical and mathematical models of drought and desertification processes, and drought prediction;
- Elaboration of drought early warning system;
- Combating drought and desertification by hydro-meteorological, hydro technical amelioration and agro-meteorological techniques;
- Study of historical dynamics of climatic elements and parameters in the region under review, both during summer seasons and vegetation periods;
- Identification and mapping of likely zones of desertification;
- Determination of hydrological regime of arid lands water resources and their change trends;
- Assessment of water resources deficit in arid lands and its possible variations;
- Assessment of subsoil main structural parameters (arable lands, rangelands, forests, etc.)
- Developing a theoretical model of the soil desertification process;
- Study of population numbers, dynamics (birth and mortality rates), density and migrations;
- Evaluation of landscape and geographical conditions of land desertification and mapping of ecological stress;

- Study of natural and man-induced processes of land damage and desertification (water and wind erosion, mudflows, irrigation erosion, wood clearing, mining and quarrying, etc.), systems analysis, risk projection;
- Study of soil and ground composition, condition and physical-mechanical properties, and zonation of territory by erosion risk;
- Elaboration of a regional model framework for combating land desertification and stabilisation of biospheric processes;
- Elaboration of a long-term national programme for prevention and/or reduction of land degradation/desertification, and promotion of sustainable development;
- Identification of vulnerable areas and elaboration of rehabilitation action plans;
- Identification of affected areas and detailed mapping;
- Selection of pilot project locations and implementation of pilot projects based on the principle of sustainable use of natural resources;
- Elaboration of an integrated plan for reclamation of desertified areas;
- Soil reclamation study of desertification-threatened areas and detailed mapping of salinized and solonchaks soils groupings for agronomic amelioration purposes;
- Inventory of soils affected by open-cast mining and their recultivation methods.

#### Economic Mechanisms to Combat Desertification:

- Study of the impact of economic policies and economic activities on desertification processes;
- Definition and evaluation of damage caused by desertification;
- Estimation of funding necessary for reclamation of lands affected by the desertification process;
- Evaluation of funds required for reclamation of lands affected by the desertification process and determination of economic leverage to mobilise funds;
- Monitoring of existing projects and programmes to combat desertification.

#### Preserving Biological Diversity Against the Background of Desertification Processes:

- Defining the status of plant species facing the threat of existing and/or severe genetic erosion on the basis of threat category criteria established by the International Union for the Conservation of Nature and Natural Resources (IUCN);

- Identification of plant communities facing the threat of extinction/degradation caused by desertification (including rare, relict, primary and the related, particularly sensitive communities, and globally important communities);
- Elaboration of a programme for conservation of rare, endemic and relict species critically threatened by desertification, and its initiation;
- Elaboration of a state programme for protection of endangered biomes and conservation of plants and plant communities;
- Identification of hotspots, determination of ways and means to conserve them and initiation of activities;
- Elaboration and implementation of a state programme for conservation of flood-plain forests;
- Establishment of plant and animal life indicators of desertification, and their monitoring;
- Elaboration of a state programme for conservation of arid forests;
- Ecological assessment and mapping of plant communities in the areas threatened for desertification.

#### Raising Public Environmental Awareness:

- Improving the level of environmental education among public;
- Publication of country-specific and Caucasus region information bulletins;
- Promotion of new local NGOs establishment and enhancement of existing NGOs.

#### Monitoring of Desertification:

- Improving the existing legislation, assignment of functions among relevant agencies;
- Identification of governmental and non-governmental organisation to be responsible for, and involved in, the monitoring, and their capacity-building;
- Developing a unified monitoring methodology;
- Making an inventory of data gathered up to the date by various departments and institutions of the Georgian Academy of Sciences, NGOs and other agencies, and incorporation of the available data into a databank;
- Continuous exchange of monitoring information between the Ministry of Environment and Natural Resources of Georgia and all interested agencies and other stakeholders.

#### Desertification and Agriculture:

- New registration and certification of pasturelands, identification of resources, determination of appropriate grazing pressure norms, rehabilitation of degraded pasturelands;
- Elaboration of a programme for rehabilitation, protection and sustainable use of Georgia's traditional agriculture, with active involvement of grass-roots organisations;
- Promotion of agriculture-related traditional expertise, research, and relevant programmes;
- Elaboration of cultivated land management guidelines and plan.

#### International and Regional Cooperation:

- Regional conference on combating desertification with participation of Southern Caucasus states;
- Design of a joint strategy to combat desertification;
- Cross-border cooperation, including for the purpose of establishing trans-boundary protected areas;
- Familiarisation with the international experience of combating desertification through trainings and study tours.

## **The Republic of Moldova - National Action Plan to Combat Desertification**

2000

Link: [http://www.unccd.int/ActionProgrammes/republic\\_of\\_moldova-eng2000.pdf](http://www.unccd.int/ActionProgrammes/republic_of_moldova-eng2000.pdf)

26 pages

Republic of Moldova joined the United Nations Convention to Combat Desertification in those countries experiencing serious drought and/or desertification, particularly in Africa, on December 24, 1998.

One of the objectives of this Convention is elaboration of the National Action Programme. The purpose of the Programme is to identify the factors contributing to desertification and practical measures necessary to combat desertification and mitigate the effect of drought. The National Action Programme specifies the role of the Government, local communities and land users, and the resources available and required.

### **Contents**

- Introduction
- Programme Background (Climatological factors as desertification intensifiers)
- Strategy to combat desertification (Promotion of sustainable policies in the use of natural resources; Social, economic, political and demographic background to preserve natural resources and to combat desertification; Legal and institutional framework, scientific and information support in desertification control; Scientific support for evaluation, prevention and combat of desertification; Desertification Monitoring)
- Strategic Action plan to combat desertification and financial costs
- References

The National Action Programme to Combat Desertification has to:

- Incorporate long-term strategy to combat desertification and mitigate the effects of drought, emphasize implementation and be integrated with the national policy for sustainable development;
- Allow for modifications to be made in response to changing circumstances and be sufficiently flexible at the local level to cope with different socio-economic, biological and geo-physical conditions;
- Give particular attention to the implementation of preventive measures for lands that are not yet degraded or which are only slightly degraded;
- Enhance national climatological, meteorological and hydrological capabilities and means to provide for drought early warning;
- Promote policies and strengthen institutional framework which develop cooperation and coordination, in a spirit of partnership, between the donor community, government at all levels, local population and community groups, and facilitate access by local population to appropriate information and technology;
- Provide for effective participation at the local, national and regional levels of non-governmental organisations and local population, particularly resource users, including farmers and pastoralists and their representative organisations, in policy of planning, decision-making, implementation and analysing of the National Action Programme;
- Require regular review and progress reports on their implementation.

The main measures in the environment protection area are:

- Maintenance of lands productivity in case of desertification of affected territories via implementation of social accepted and economically feasible ecological soil exploitation systems;
- Protection of non-degraded or slightly degraded soils and/or their conservation for natural rehabilitation;
- Providing the guarantee of no-recurrence of drought and de-stabilisation of economy;
- Rising living standards for population in the desertification affected areas, including health protection, better sanitary conditions and family planning;
- Avoiding negative effects leading to climatic and biodiversity changes as a result of actions undertaken during desertification processes.



## **Strategy to Combat Desertification**

In actions to combat desertification usually measures used to be undertaken to rather treat the symptoms of this phenomenon than the causes that generated it. These measures used to target minimization of consequences and reduction of human activities, which were thought to contribute to appearance of desertification phenomenon.

Thus, direct actions were undertaken to combat directly such consequences of human activities as soil exhaustion, excessive pasturage, forest cutting and incorrect irrigation methods. At the same time, main social and economic reasons that used to generate this phenomenon were paid no attention to. The created impression was the desertification victims were the ones that generate this phenomenon. No serious efforts were, however, made to understand these forces. These forces being beyond their influence made people to exploit excessively the land. It is admitted at present that this narrow direction was one of the main reasons that had led to disappointing outcomes of the implementation of 1977 Action Plan. The Convention is expected to avoid such a drawback and include social and economic issues among envisaged analytical and practical activities. It is expected that such issues will be paid similar attention that is paid to physical and biological issues of desertification.

The Republic of Moldova has made the commitment to consider issues ensuring exclusion of causes that lead to desertification and to pay special attention to social economic factors that contribute to the development of desertification processes. At the same time it makes the commitment to assume a complex approach towards ratio between physical, biological and social economic aspects of desertification and drought processes. In particular, integration of strategies targeted to poverty alleviation, desertification combat and mitigation of draught consequences is envisaged.

It is poverty that makes people from affected regions to extremely exploit the soil, because they face the survival issue today. That is why they cannot but choose to act contrary to long term interests. Any implemented strategy needs to envisage measures targeted to liquidation of poverty main consequences. Such a strategy needs to take into account the social structures and problems linked with the land. It is necessary to pay attention to training, professional education as well as to transportation and communication, in order to envisage a totally integrated approach. The latter is the only way to effectively combat desertification.

## **Romania – National Strategy and Action Programme Concerning Desertification, Land Degradation and Drought prevent and Control**

Link: <http://www.unccd.int/ActionProgrammes/romania-eng2000.pdf>

117 pages

The climatic data of the last century show a progressive heating of the atmosphere and a reduction of the precipitations, which became limitative factors for the growth, development and productivity of crops from certain geographical region of the country and also strong constraint factors for the allocation and use of the water resources.

In 1997 Romania signed (by law no. 629/1997) “ The Convention to Combat Desertification (CCD) “, adopted in Paris on June 17/1994, became operatively on December 26, 1994 and elaborated on the basis of the Resolution United Nations General Assembly 47/188 from December 22, 1992 as following United Nations Conference on Environmental and Development in Rio de Janeiro (1991). The objective of Convention is the desertification combat and the reduction of drought results in those countries experiencing serious drought and/or desertification by efficient measures in every level, for a sustainable development in the concerned areas.

The present strategy follows the decisions CCD and Ministry of Waters, Forests and Environment Protection and represents the synthesis of studies elaborated by Forest Research and Management Institute (FRMI), Research Institute for Soil Science and Agrochemistry (RISSA), National Company “National Institute of Meteorology, Hydrology and Water Management” (NC-NIMHWM), Studies and Designing Institute for Land Improvement (SDILI), National Institute of Research – Development for Environment Protection (NIRDEP), Research and Technological Engineering Institute for Irrigations and Drainage, Baneasa-Giurgiu (RTEID), Research Institute of Life Quality, Research Institute for Grains and Technical Crops Fundulea (RIGTC) and Research and Production Institute for Grass Cultivation, Magurele- Brasov (RPIGC).

## **The Strategy of Desertification, Land Degradation and Drought prevent and control**

### **General principles**

The basic principles of the elaboration of the strategy were as follows:

- Agricultural and forestry sustainable development
- Biodiversity conservation and natural resources
- The prevention and reduction risks in natural hazards occurrence
- The improvement of quality of life, especially by rural development in the areas exposed on desertification, lands degradation and drought

### **The General and specific objectives of the strategy**

The general objective based on two distinct matters:

- the prevention and combat of desertification, drought and lands degradation in those territory exposed on desertification;
- the prevention and combat lands degradation in moist areas. It was considered that the lands degradation in moist areas because by accenting degradation process in this lands can grow true desertification nucleus.

Started with the necessity of solved the desertification problems the strategically

- objective was classified into 6 priority axis:
- the development and improvement legislation
- institutional development
- human resources ensuring
- the technical- scientific basis development
- the rural development in the areas exposed on desertification and lands degradation

## **The politics frame**

### **The land use management**

The strategy concerning the objectives, measures and actions in the territory arrangement in our country is rediscovered in European Chart, too.

- Fundamental objectives:

- The balanced socio-economical development of the regions to hold under controls the crowded areas and the areas development in decline.
- The amelioration of life welfare, the territory arrangement to meet the improvement work conditions, cultures, relations, equipment and others.
- The responsible administration of natural resources and environmental protection.
- The rational territory use.

- The particularly objectives:

- The rural areas development, the creation of acceptable conditions of life, especially in the poor areas
- The check of urban areas growth, by soil occupation plans and by economical activity development to improve life conditions
- The frontier areas need a coordination policy of the neighbouring states to open the frontiers for common use of infrastructure facilities and to facilitate a regional development
- The mountain areas – by ecological, economical, agricultural, forest roles, social and cultural, also by natural resources
- Structural insufficient stability of living areas that needs a special help
- Declined industrial areas with slowly economical activity caused by industrial reconversion and wear mono-structural equipment which needs special support program

- The seacoast areas and the islands need balanced development and a check urbanisation, following the objectives dictated by environment protection
- The territory management needs to be elaborated according local, regional and national necessities

### **Sustainable management of the natural capital**

The sustainability of the natural capital in the area under desertification must start from “agroforestry” and suppose the balanced relations between agricultural and forestry ecosystems.

The political and socio- economical premises concerning natural capital are:

- The environmental protection actions and measures must occupy important place in all national programs of economical development
- To establish the responsibilities of states institutions and of other organizations for a sustainable development
- Non government organizations implication in all decision levels to aware the environment protection

The effects of droughts, soil degradations and desertification are reflected in natural capital degradations (natural, part-natural, artificial ecosystems). For the attenuation of these effects it must to take into account the politic framework by:

- The soil degradation and overexploitation
- The replacement of some forests ecosystems with others
- The degradation and overexploitation of water resources
- The diminution of food resources from domestic and wild animals through conserving and amelioration of natural ecosystems
- The promotion of specific agro technical measures for extending areas under aridity
- The overloading of traditional energy resources (wood, coal)

Also it must to be considered:

- The encouragement of extending of small area experience accumulated in the alternative energy sources to all the country
- The wind power resource mapping
- The setting of a scientific-technical centre to encourage the use of alternative energy

### **Biodiversity conservation**

Biodiversity conservation is conditioned by human factors due to activities, which lead to soil and water erosion, air pollution, pesticides and chemical manures use, the industrial and domestic wastes depositing, the deforestations and excessive grazing. The negative impact reduction of economical activities must to achieve the following objectives:

- The industrial and energetic units modernization
  - The legislative measures for the pollution reduction
  - The forests conservation through the proper forest management
  - The state control of chemicals used in agriculture and forestry
- For the biodiversity conservation and increase the resistance to desertification is imposed:
    - The protected areas extension
    - The phytocenosis rehabilitation with local species
    - The protection foresights implementation over the biodiversity in –situ and ex-situ on international Conventions where Romania subscribe.
    - The moist areas restoration and extension
    - The regional and bilateral international cooperation in biodiversity protection

## **Sustainable development in forestry and agriculture**

The forest and agricultural ecosystems are basic components of natural capital.

- The actions which answer of a sustainable agriculture are:

-building of a agricultural exploitation framework to eliminate economical and ecological damages

-exploitation trough lands amalgamation and association

-gradual restriction of the arable fields on the slope over 12 % and with degraded soils, either trough conversion of other agricultural employment or trough afforestation

-the agricultural systems development in following directions:

- dry-farming systems in absence of irrigation areas
- systems with limited irrigation in water deficit resources areas
- intensive agricultural systems in areas provided with sufficient water resources to irrigate
- application of composted organics manure
- introduction of the protection management through optimum pesticides utilisation
- creation of complex agro-zootechnical systems
- ecological reconstructions of bad lands, degraded trough industrial activities (mining, sterile waste dumps, petroleum and salty waters pollution, heavy metal pollution a.o. ) on basic principle that the pollutants pays)
- low productive soils amelioration (sands, salty, affected by moist and/or low acidity) just in case of economical and strategically justification )
- races and hybrids of plants creation with great drought resistance
- plantation of protection forests belts in affected areas
- perfection and extension insurance system of crops.

The actions designed to answer of a sustainable forestry are:

- integrity assurance and sustainable development of forest capital as well as the extension of lands area with forest vegetation
- institution of the concept of sustainable management
- stability assurance and functional efficacy rise of forest ecosystems
- reconstruction of the forest affected by decline
- to sustain the forest owners for durable management of forests
- representative forest ecosystems integration in the national network protected areas
- durable management of game and piscicultural resources
- development of forest services and produces, others than the wood
- adapting the forest administration and checking forest regime in conditions on different property forms
- public, lands holders and the political society awareness about the importance of national patrimony forest

### **Sustainable water resources management**

The water absence in semidry and dry sub moist areas has become a chronic phenomenon with negative effects of economical nature in agriculture, vegetable crops, zootechnics, forestry and fisheries. The effects also are felt in potable water supply, transportations, electric power producing, people health and know amplification, particularly, over dry periods. For the sustainable development of affected areas it must to take into account in the planification of water resources for irrigation, the normal and dry conditions to eliminate short crises.

In that sense it is impose to:

- Setting up of the diagnosis indices (aridity indices, precipitation amount, groundwater level, water volume in the lakes, river discharges)
- Setting up of the particular moment of crisis starting
- Setting up of the responsibilities of institutions
- Continuous people information



## **The regional cooperation**

To know the time and space evolution of the environment factors, and hydric factors particularly, we need data and information from very large areas, which pass beyond the frontiers. Consequently, it results a straight importance of states cooperation in region on problems concerning the prevention and combat desertification.

So, it must have in view:

- collection, analysis and change of pointed out data and information for the sake to have under systematic observation the lands degradation in the affected areas and for a good understanding of processes that occur in desertification and drought
- cooperation on monitoring of desertification, lands degradation and drought
- development of joint research programme to establish the causes that produce such phenomena and the measures required to prevent and combat them.

## **Contents**

- General physico-geographical characteristics of Romania and peculiarities of regions with desertification, land degradation and drought
- Factors which generate desertification, land degradation and drought
- Effects of the factors responsible for desertification, land degradation and drought
- Identification and delimitation of the areas affected by desertification, land degradation and drought
- The strategy of desertification, land degradation and drought prevent and control
- Action Programme concerning desertification, land degradation and drought prevent and control

## 1.3 United Kingdom - Drought Plan

2013

Link: [http://www.anglianwater.co.uk/assets/media/Draft\\_Drought\\_Plan\\_2013\\_FINAL.pdf](http://www.anglianwater.co.uk/assets/media/Draft_Drought_Plan_2013_FINAL.pdf)

Contact: [www.anglianwater.co.uk](http://www.anglianwater.co.uk)

122 pages

This report is Anglian Water's draft Drought Plan 2013 that has been prepared in response to comments received following consultation on our draft Drought Plan 2012. For ease of reference the changes between the two drafts have been highlighted throughout the document.

### Contents

- Drought Plan Framework
- Regional Overview
- Drought Management Strategy
- Drought Triggers and Scenarios
- Drought Forecasting
- Drought Measures to Manage Supply and Demand
- Minimising the Impact of Drought on the Environment
- Drought Management and Communications Plan
- Post Drought Actions

Anglian Water's Drought Plan 2013 has been produced to comply with the statutory requirements introduced in the Water Act 2003, the Drought Plan Direction 2011 and Environment Agency guidelines. The purpose of our drought plan is to demonstrate how we will protect public water supplies during a drought, whilst minimising any potential environmental impacts that may arise as a result of our activities. This draft Drought Plan 2013 has been prepared in response to comments received following consultation on our draft Drought Plan 2012.

We supply water and wastewater services to some 5.5 million people in the Anglian region and in the Hartlepool Water supply area. We operate eight raw water storage reservoirs which, along with eight direct supply river intakes, provide 50 per cent of the water supply across our region. The remaining 50 per cent is provided by groundwater abstracted from 200 sources, and 450 operational boreholes.

The Anglian region is the driest region of England and our drought plan draws on extensive experience of managing four drought periods since privatisation in 1989, including the recent

experiences from 2011-12. Prior to the 2011-12 drought event, we had invested in the region of £100 million to improve the resilience of our water supply system against severe drought events. In response to the 2011-12 event, we identified a £63 million programme of capital investment to 2015, which will protect customers' supplies further.

The lessons that we have identified from our response to previous droughts have helped to shape our drought plan. We are confident that the drought management actions we propose are robust enough to maintain public water supplies during periods of low rainfall.

Every drought varies in terms of its location, intensity, duration and impact. Our drought plan sets out the management actions that we will take before, during and after a drought.

The drought plan is not strategic but outlines a framework for managing a drought were it to occur under present circumstances with existing infrastructure. Our drought management process is laid out in the following flow chart which also sign-posts the relevant sections of the plan.

Continuous monitoring of rainfall, river flows, reservoir storage and groundwater levels is key to helping us identify the onset of a drought. We have developed a range of hydrological triggers that provide us with sufficient lead time to deploy a variety of drought management measures as drought conditions prevail.

We assess the risk of drought against an analysis of how much water is reliably available during the worst recorded historical drought conditions. This defines the yields of our reservoirs, direct river intakes and groundwater sources that are used to maintain a secure balance between the availability of water supplies and the demand from our customers.

We define the yield of our reservoirs in relation to the frequency that we would seek to impose water supply restrictions. We define these as our current levels of service as follows:

Temporary use restrictions, no more than once in every 10 years.

A ban on non-essential water use which may also impact commercial customers, no more than once in every 40 years.

Provision of standpipes and use of rota-cuts, no more than once every 100 years.

Through historic and recent investment to secure our vulnerable groundwater sources and our direct abstraction river intakes against drought, customers supplied from these sources receive a higher level of service than customers who depend on supplies from reservoirs.

Consultation and discussion at national and regional level during the 2011-12 drought highlighted that it is no longer acceptable to include a planned level of service that may result in the imposition of standpipes or rota cuts for our customers. In response to this, and through the consultation for our latest water resources management plan, we are asking customers whether we should invest £400 million over the next 10-15 years, to remove any risk of future rota-cuts or standpipes in extreme drought events.

Due to the combined pressures of climate change, population growth and environmental regulation on resources in this water stressed region, we have a long history of talking to our customers about water conservation. Our Love Every Drop campaign is our strategy to raise the awareness about how important water is to life, to people, to the environment and to a growing economy. As drought conditions prevail, we will continue to build on this messaging with our customers, and our regulators, to ensure that we take appropriate actions as a rainfall deficit accumulates. We will follow our drought communications strategy as the situation deteriorates.

During the 2011-12 droughts, the Secretary of State set up the National Drought Group in which Anglian Water took a leading role. This provided a single coherent, cross-sector team, which was able to manage co-ordinated delivery of drought management activities, communications and risk management. In addition, and together with the Environment Agency, we led several national events to encourage

the industry and our regulators to understand the true impacts of drought and ensure better preparedness in the future. The level of collaboration and co-operation within the water sector was high during this drought.

The cornerstone of our long-term water resources management strategy continues to be a twin-track approach of promoting demand management in parallel with measures to secure resources in order to maintain our supply-demand balance.

During a drought we would increase our demand management activities through enhanced customer communications, water-efficiency promotions, metering and enhanced leakage detection.

We recognise, however, that there will be occasions during certain drought conditions when restrictions on customer use will be required to reduce demand further. In addition to increasing our activity in these areas, we will also look to implement restrictions on customer use through application of the new powers afforded to water companies under the Water Use (Temporary Bans) Order 2010. These new powers would primarily affect domestic customers, and allow us to restrict private use of all hosepipe activity, without the need to apply to the Secretary of State for a drought order. We will consult widely and will allow sufficient time for representations to be made before imposing any such restrictions on our customers.

On the supply side, we would seek to optimise the conjunctive use of groundwater and surface water sources, and review trading opportunities with our neighbouring water companies, as the drought develops. During the 2011-12 drought, we identified investment opportunities to accelerate some supply-demand schemes to commission a number of our licensed abstraction sources. We have been advised by the Environment Agency that there is a risk that some of these options may not conform with the requirements of the Water Framework Directive. We are working closely with the Environment Agency to better understand the implications. Where necessary we can apply for drought permits or drought orders to amend the conditions of our abstraction licences to help us to secure the availability of water during a period of exceptional shortage of rain. In our planning we have included the provision of drought permits for seven of our surface water sources where we feel that intakes may be vulnerable to drought impacts.

To ensure any environmental impacts are minimised, we have completed a full update and have improved the environmental assessment for each source where a permit may be required. These also include a Habitats Directive Assessment in accordance with regulatory requirements. We are confident that our proposed drought actions will not have any significant impact on any internationally designated conservation sites. This revised drought plan has been subjected to further assessment under the Strategic Environmental Assessment

Directive and this is available under separate cover.

We have included an environmental monitoring plan to identify the important baseline information required to support any future applications for drought permits.

We will review our drought plan on an annual basis and will complete a full revision no later than 3 years and 6 months after publication of this plan, in accordance with guidance. We welcome comments on our drought plan from customers and key stakeholders.

### **Purpose of Plan**

Our drought plan has been developed in accordance with the requirements of the Water Industry Act 1991 to describe how we as a 'water undertaker will continue, during a period of drought, to discharge our duties to supply adequate quantities of wholesome water, with as little recourse as reasonably possible to drought orders or drought permits.' The purpose of our drought plan is, therefore, to protect public water supplies whilst minimising any environmental impacts that may arise, as a result of our activities, during a prolonged period of low rainfall.

Every water company in England and Wales is required, by law, to prepare and maintain a statutory drought plan. Whilst drought plans are prepared in accordance with prescribed guidelines, they will each be different due to the different supply system characteristics of each water company. We will always seek to work together with other water companies, and especially with our neighbouring companies, to ensure that during times of drought we provide a clear message to our customers. This is especially important during times when we may need to impose water use restrictions, as our customers experienced during the 2011-12 droughts. The legislation governing how a water company may impose a hosepipe ban changed in 2010 and we have consulted as an industry to ensure a consistent interpretation of the new powers. However, customers should recognise that approaches to demand management will vary between different companies.

Each drought varies in terms of intensity, duration, geographical coverage and impact. Our drought plan draws on previous experience in our region, alongside the direction and guidance from Government and the Environment Agency. We have reviewed the measures that we have in place to maintain secure water supplies during the worst recorded droughts for all of our water sources. The plan sets out the management actions that we will take before, during and after a drought. The drought plan is not strategic but outlines a framework for managing a drought were it to occur under present circumstances with existing infrastructure.

The Environment Agency is responsible for producing its own drought plan to protect the environment, water abstractors and the interests of other users of the environment. Both the Environment Agency's Anglian Region and Yorkshire and North East Region drought plans were out for consultation in 2011 and the final plans are available on its website. This endorses how the Environment Agency and water companies will actively work together to manage a drought. The Environment Agency has a duty for long-term water resources planning and is a statutory consultee in the development and review of both our water resources management plan and drought plan. Our draft Drought Plan 2013 is consistent with the Environment Agency's Anglian Region Drought Plan 2011 and has many synergies in terms of hydrological and environmental monitoring, triggers and communications strategies.

It should be recognised that a water resources drought will usually only develop after several months of below-average rainfall. This is different from an agricultural drought when unseasonably dry soils may arise from only weeks of dry weather over the growing season.

It is possible, therefore, that the Environment Agency may choose to announce that the region is in drought due to wider environmental concerns, as opposed to a concern over the security of public water supplies. We recognise that this can cause some confusion with our customers and we will continue to work closely with the Environment Agency during such times to explain and clarify our individual roles and responsibilities.

The effectiveness of our management in previous droughts can be measured by the adoption of timely measures and responses that have enabled us to maintain the security of public water supplies. We believe that this current drought plan provides a robust approach to drought management and we are confident that it provides the flexibility we require to maintain future public water supplies.

### **Drought Management Strategy**

Part Three of our drought plan presents the strategy and technical detail around how we propose to manage public water supplies during the onset and prevailing conditions of a drought.

This part of the plan includes the following sections:

- Our drought management process detailing how we manage our water resources from normal conditions through to drought.

- Our drought triggers and scenario testing, which highlights how we identify the different stages of a drought and when we implement drought management actions.
- Our methodology for drought forecasting detailing how we project the effects of prolonged rainfall deficits.
- Our measures for managing supplies and demand during drought periods, including details of how we would seek to implement restrictions on customer use.
- Our environmental assessments and monitoring plan detailing how we would seek to minimise the impacts of our drought actions on the environment.
- Our management structure and communications plan.
- And the post-drought actions that we will undertake at the end of a drought

Our drought management strategy incorporates a range of drought management activities and decisions that are aligned to the onset of a drought, as defined either by the Environment Agency or ourselves as the potential risk to supply increases during a prolonged period of low rainfall. The process that we follow during the progression from normal to potential drought to drought are summarised in the following sections.



## 2. Review of Central and Eastern countries – desertification and drought documents

Table: Review of current status about drought/desertification problematic South and Eastern Europe

Country	NAP (drought)	Other documents	links
Albania		The first national communication of Albania to the United Nations Framework Convention on Climate Change (UNFCCC) (2002)	<a href="http://unfccc.int/resource/cd_roms/soge/material/SEM_SUP3_albania.pdf">http://unfccc.int/resource/cd_roms/soge/material/SEM_SUP3_albania.pdf</a>
Bosnia and Herzegovina		Initiative on „Capacity Development to support National Drought Management Policy“  (WMO, UNCCD,	<a href="http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/31/Bosnia_Herzegovina_CountryReport.pdf">http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/31/Bosnia_Herzegovina_CountryReport.pdf</a>  <a href="http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/65/Bosnia_Herzegovina_CountryReport.pdf">http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/65/Bosnia_Herzegovina_CountryReport.pdf</a>

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		<p><b>Bosnia and Herzegovina.</b> Banja Luka.</p> <p><b>Initial National Communication (INC) of Bosnia and Herzegovina under the United Nations framework Convention on Climate Change (UNFCCC).</b> Banja Luka, October 2009.</p>	<p><a href="http://unfccc.int/resource/docs/natc/bihnc1.pdf">http://unfccc.int/resource/docs/natc/bihnc1.pdf</a></p>
Bulgaria		<p><b>Fifth National communication on climate change (Second Submission) – United Nations framework convention on climate change</b> (Sofia, 2011).</p> <p><b>Drought in Bulgaria – A</b></p>	<p><a href="http://unfccc.int/resource/docs/natc/bgr_nc5.pdf">http://unfccc.int/resource/docs/natc/bgr_nc5.pdf</a></p>

		<b>Contemporary Analog for Climate Change.</b> C. Gregory Knight, Ivan Raev, Marieta P. Staneva	<a href="http://www.solvobg.com/Acro/ashgate.pdf">http://www.solvobg.com/Acro/ashgate.pdf</a>
<b>Croatia</b>		<b>Meteorological drought monitoring in Croatia</b>  <b>Drought conditions and management strategies in Croatia</b>	<a href="http://www.dmcsee.org/uploads/file/77_meteorological_drought_monitoring_in_croatia_k_cindric.pdf">http://www.dmcsee.org/uploads/file/77_meteorological_drought_monitoring_in_croatia_k_cindric.pdf</a>  <a href="http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Croatia_CountryReport.pdf">http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Croatia_CountryReport.pdf</a>
<b>Republic of Macedonia</b>		<b>Drought Conditions and Management Strategies in Republic of Macedonia</b>	<a href="http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/31/Macedonia_CountryReport.pdf">http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/31/Macedonia_CountryReport.pdf</a>
<b>Greece</b>	Exist		

<b>Hungary</b>	Exist	<b>Hungary – Desertification and Drought</b>  Zsuzsanna Steindl-Kerekes ; Dep. Head of Department; River Basin Management and Water Protection; <b>Water Resource  Management in  HUNGARY</b>	<a href="http://www.un.org/esa/agenda21/natlinfo/countr/hungary/desertification_drought.pdf">http://www.un.org/esa/agenda21/natlinfo/countr/hungary/desertification_drought.pdf</a>  <a href="http://www.fresh-thoughts.eu/userfiles/file/pptmrc/15Water%20Management_in_Hungary.pdf">http://www.fresh-thoughts.eu/userfiles/file/pptmrc/15Water%20Management_in_Hungary.pdf</a>
<b>Moldova</b>	Exist	<b>Drought  conditions and  management  strategies in the  Republic of  Moldova</b>	<a href="http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Moldova_CountryReport.pdf">http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Moldova_CountryReport.pdf</a>
<b>Romania</b>	Exist	<b>Drought  conditions and  management  strategies in  Romania</b>	<a href="http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Romania_CountryReport.pdf">http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Romania_CountryReport.pdf</a>
<b>Slovenia</b>	In implementat	<b>Drought  conditions and</b>	<a href="http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Slovenia_CountryReport.pdf">http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Slovenia_CountryReport.pdf</a>

	ion	<b>management strategies in Slovenia</b>	
<b>Turkey</b>	Exist		
<b>Montenegro</b>		<p><b>Initiative on “Capacity Development to support National Drought Management Policy”</b> (WMO, UNCCD, FAO and UNW-DPC)</p> <p><b>Montenegro spatial Plan until 2020</b></p> <p><b>Montenegro Water Law, 2007</b></p>	<p><a href="http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Montenegro_CountryReport.pdf">http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Montenegro_CountryReport.pdf</a></p> <p><a href="http://www.ada-bojana.info/docs/Spatial_plan_of_Montenegro_until_2020.pdf">http://www.ada-bojana.info/docs/Spatial_plan_of_Montenegro_until_2020.pdf</a></p> <p><a href="http://www.gov.me/files/1246958897.pdf">http://www.gov.me/files/1246958897.pdf</a></p>
<b>Serbia</b>		<b>Initiative on “Capacity Development to support National</b>	<a href="http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Serbia_CountryReport.pdf">http://www.ais.unwater.org/ais/pluginfile.php/548/mod_page/content/53/Serbia_CountryReport.pdf</a>

		<b>Drought Management Policy”</b> (WMO, UNCCD, FAO and UNW-DPC); <b>Country Report;</b> <b>Drought conditions and management strategies in Serbia</b>	
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### **3. Future aim of Activity 7.1**

In the next period we will analyse other similar projects of European Union and we will include good practices from mentioned projects and from Integrated Drought Management Programme in Central and Eastern Europe. At the end of the year 2014 we will prepare a Compendium of our results which will be a good promotional brochure of Integrated Drought Management Programme in Central and Eastern Europe.