CHAPTER 5. CONCLUSIONS, RECOMMENDATIONS AND SYNOPSIS

5.1 Conclusions

1. The general trend of impacts

The general trend of impacts on the Caucasus environment is of the nature of regular increases, starting from the 1970s and lasting until the 1990s. After that, a sharp decline and then, more recently again, minor increases were observed. As a result, the intensity of impacts on the environment in 2000-2001 was very close to the levels of 1970s, and in some cases even less.

In different parts of the Caucasus, this trend of decreasing environmental impacts appears in different ways and to a varying extent. Generally, it is less distinct in the North Caucasus. Within the South Caucasus states, decreasing environmental impacts are most clearly seen in Georgia and then Armenia and Azerbaijan. As for the North Caucasus, a decrease of environmental impacts is less noticeable in Krasnodar and Stavropol krays than in the various autonomies.

The major sources of impacts on environment are also changing. Whereas in the 1970s and 1980s, stationary and mobile sources were the major sources of atmospheric air pollution, at the end of the 1990s, the share of mobile pollutant sources (auto transport) increased dramatically and became predominant.

The same is happening in terms of water pollution. In contrast to the 1970s and 1980s, the share of industrial and agricultural pollution has decreased, and the role of municipal sources of pollution has increased.

Soil contamination used to be very high in Soviet times because of the intensive use of mineral fertilizers and pesticides. However, as a result of the decline in agricultural production and concentration on local markets only, soil contamination by pesticides and other chemicals was greatly reduced in the 1990s.

Armed conflicts contributed significantly to the pollution of the Caucasus environment in the 1990s. Apart from direct impacts on the environment, these conflicts caused a great number of fires with consequent pollution of the atmosphere, oil spills resulting from attacks on oil storage tanks, and many other direct or indirect consequences. The harmful effects of these incidents could be seen not only in conflict zones themselves, but in neighbouring districts as well. The impact of air pollution during the Chechen War was observed in neighbouring Dagestan, for instance.

Refugee camps became new "hot-spots", contributing to environmental pollution in the region. This was especially the case in Azerbaijan and Ingushetia, where hundreds of refugees live in unsanitary conditions, and there are few if any treatment facilities to handle related waste products.

New tendencies of pollution caused by municipal services are observed in the Caucasus recently. While during Soviet times, cities were well-equipped with central heating systems, such services currently does not operate in Armenia or Georgia and are compensated for by use of firewood, gas or kerosene stoves. Municipal services in the region generally are in a very poor condition, and sewage, water pipes and electric supply are often out of order, factors which can eventually have catastrophic effects on environmental conditions there.

Thus, the observed trend of changing impacts on the environment is closely related to the intensity of industrial and agricultural production and transportation. However, the decrease in economic activities is not always accompanied by similar decreases in environmental impacts. In the Caucasus, despite declining production capacities, additional negative impacts on the environment are still taking place, due to obsolescence or complete absence of pollution control equipment.

2. Biological diversity

In general during the last 30 years, there has been little or no significant change in the biological diversity of the Caucasus. Major losses among animal life and rare floristic species took place in the 19th and first half of the 20th centuries. Currently, one sees only quantitative changes resulting from a reduction in specific rare species, mainly due to poaching. The quantity of some single populations of rare and some herbal species is also being reduced, caused either by illegal or extremely extensive harvesting.

The area of protected territories has increased over the last 30 years, from 898,000 to 13,035,000 ha (from 2% to 3% of the Caucasus' total land area), and the total number from 37 to 46 over the last 15 years, for instance. However, many protected areas exist on paper only, or intensive cattle pasturing or poaching are occurring there.

The structure of protected areas during the last decade has changed. While in the Soviet Union, there were only two types of protected areas (nature reserves and managed nature reserves or "zakazniks"), the current number of categories has increased. The Georgian protected areas' network, for instance, now includes six categories: national park, nature reserve, managed nature reserve, nature monument, protected landscape and area of multi-purpose use.

3. Forests and related problems

Officially, the total land area designated as forestland has increased. This is caused by the fact that in Soviet times, part of the forests were owned by the State Forests Fund ("Goslesfond"), and in the post-Soviet era because local authorities could not manage them properly, some collective farm ("kolkhoz") forests have also been moved to this same category.

Because of de-population of some mountain regions (for example, Racha in Georgia), an intensive shift of formerly agricultural lands to forested areas is observed. Commercial logging has declined, the quality of roads has gotten worse, machinery has deteriorated etc. All these factors have led to a reduction in pressures on forest ecosystems. Change in climatic conditions may also be leading to a complex if poorly understood series of … background impacts on growth of forested areas.

However, forest "quality" has changed in a negative sense. Highly productive trees have been replaced by less productive species, rare species are being cut more extensively and highly productive trees are diminishing in number.

An extreme increase in illegal forest cutting, especially in those districts of Georgia (Adigeni, Borjomi, Adjaria and Samegrelo) where illegal timber export to Turkey is taking place, is also observed.

4. Population

During the last 30 years, the Caucasus population has been steadily growing. However, population growth has different trends in different parts of the Caucasus. Growth was more extensive in regions with predominantly Muslim traditions (Azerbaijan and the majority of autonomies in the North Caucasus).

In the first 20 years (1970-90), population growth was regulated mainly by the dynamics of birth and death rates. In the last decade, migration processes and refugee flows from conflict zones played a more important role in population changes.

The ethnic distribution in the Caucasian states has rapidly changed, becoming in general more mono-ethnic. One reason for this may be migration and refugee flows, due partially to flight from conflict zones.

The percentage of urban population has not increased very rapidly (only by 4%). Also, the amount of land covered by urban areas remains low. Cities do not influence the environment very much, and thus the threat of urbanization is not a priority environmental issue for the Caucasus.

5. Disasters

It appears mostly coincidental that the most intensive natural disasters which occurred during the last 30 years in the Caucasus happened during the years (1987-91) when maximum anthropogenic environmental impacts were also observed. While direct "geographical determinism" does not offer real explanations for these processes, it is clear that over-population of some areas (in Ajara, Georgia for instance) provoked activation of landslides, eventually causing major economic damage to the region.

Significant damage of the 1987 avalanche in Svaneti, Georgia is a result of "disregard" to historic experiences. The avalanche destroyed only new buildings, whereas most old towers and fortifications survived.

6. The "Unforeseeable"

There were many factors and occurrences which could not have been foreseen 30 years ago, including:

a. The collapse of the FSU and the related gen eral decline of economic production.

b. The formation of new sovereign countries (Armenia, Azerbaijan, Georgia) and their independent existence.

c. The formation of "not officially recognized" but de-facto territorial units (Abkhazia, Chechnya, Karabakh, South Ossetia) with local governance, as well as the strong local power of autonomous republics and regions ("oblasts").

d. The high level of ethnic conflicts (although some "ethnic competition" was already apparent), and environmental problems asso ciated with them.

e. The change in the development structure of the Caucasus: the failure of recreation and tourism infrastructures, the change in the more traditional orientation of agriculture, the sharp decline of industrial production; and linked to this, the intensity and range of impacts on the environment.

f. The collapse of city infrastructure and dete rioration of communal services. A kind of blurring or "functional deterioration" among the urban population (although officially they still live in cities, their main incomes are generated from primitive agriculture in suburban land parcels). Instead of central heating systems, many urban as well as all rural dwellers use firewood or kerosene stoves.

g. The possibility of Azerbaijan and Georgia becoming a transport pathway (corridor) between Europe and Central Asia, and the whole Caucasus transition from being a semi-closed zone to a transit region with a rapid increase of trade turnover with Iran and Turkey.

h. The rapid decline of impacts on the environ ment, reduced pollution and the loss of inter est in many environmental problems that were critical for society in the 1970s and 1980s.

7. Factors now drawing attention to the Caucasus Region

a. Pipelines. Increased interest in the Caucasus is caused by recently discovered oil- and gas-fields in the Eastern Caucasus and Central Asia, and the challenge of transport ing these products to markets. Two alterna tive projects, the northerly (through the North Caucasus in the Russian Federation) and southerly directions (through Azerbaijan and Georgia), are already being designed. One southerly route (Baku Supsa oil pipeline) is already functioning. Currently, the project design for the southerly route's major pipe system from Baku to Ceyhan (Turkey) that will pass Azerbaijan, Georgia and Turkey is ongoing.

b. Transport Corridor Europe-Caucasus-Asia (TRACECA). This is a new function of the South Caucasus, a transportation cor ridor linking Europe to Central Asia through Georgia and Azerbaijan. This transportation system to a certain extent is already func tioning. It transports oil from Baku to Batumi by railroad and transit cargo by highways Poti (Batumi) to Tbilisi (Yerevan) from Turkey and Iran. It is planned to develop these routes further in the future. However, it is expected that the transit func tion will significantly affect environmental quality in the South Caucasus along the path of the transportation corridor route. Therefore, it is necessary to take all possible measures to avoid potential environmental impacts.

c. Regional tourism can also attract interest in the Caucasus, although it is not expected that the level of the 1980s could be achieved, when millions of Soviet citizens were spending their vacations in the Caucasus. High tourist flows were not only due to the climate and recreational potential, but also to the "Iron Curtain's" strongly restricting tourism outside of the Soviet Union. There are also possibilities to devel op the Black Sea resorts of the North Caucasus (between Anapa and Sochi), Georgia (Kobuleti-Batumi) and possibly (if the situation stabilizes) the Abkhazian part of Georgia (Gagra-Pitsunda-Sukhumi). The Caspian Sea will probably take on a more local function for recreational purposes. There are also good possibilities for devel oping winter resorts, as well as mountain climbing and hiking (alpinism). But because of state barriers (boundaries), as well as con flicts zones and insufficient security, these

would for the time being, at least, have some limitations. Eco-tourism and recreation in rural areas would also seem to have a good chance of being developed.

d. **Agriculture** will hardly achieve the level of Soviet times, and probably only continue to have regional significance. Kuban and Stavropol in the North Caucasus would still play a critical role for the Russian Federation's agriculture. Intensity of agricul tural processes in the South Caucasus will depend on the demands of local markets. However, some products (Kakhetian wine of Georgia, for instance) could also gain a regional market. Because of the very high competition in the international market, the sub-tropical agriculture of the Caucasus, once very advanced, has little chance to survive even at the regional level, and is likely to turn towards production for local use only.

e. Because of low economic potential, **indus trial production** would only be suitable for local and occasionally regional markets.

8. The Caucasus perspectives from other view points

a. This is a relatively unaffected "island" in terms of the natural world, and at the same time very distinct due to its high biological diversity for the temperate and sub-tropical climate zones.

b. The Caucasus is also very distinct in having one of the highest levels of landscape diver sity. Nearly 40% of all world landscape types are represented here, and thus the Caucasus is truly one of the "world's land scape laboratories".

c. Much of the Caucasus is thinly populated and thus nature is relatively well-preserved. Nowhere else in the Europe can one observe as many diverse virgin landscapes as in the Caucasus.

d. Many Caucasus regions still have a very low level of environmental pollution. This is a significant asset that can be used for recreational and touristic purposes.

e. The Caucasus is very rich in its cultural her itage and ethnic diversity, a factor that can attract attention of many people from differ ent parts of the world.

f. Overall, probably the most exceptional fea ture of the Caucasus is its high conservation level, extended network of protected areas and preservation of relatively untouched nat ural resources and a clean environment.

5.2 Recommendations

Having analysed the trends of changes in the Caucasus environment over the last 30 years, assessed the present state of the Caucasus states and territories, and considered the basic tendencies of the development of the Caucasus from the point of view of near-future potential, it is now useful to provide some recommendations for measures to be put in place and activities to be carried out. These recommendations would allow for the mitigation of negative trends observed, and reducing the threat of environmental degradation in the Caucasus.

The recommendations for the activities and measures are divided into two groups. The first group, including general recommendations developed by UNEP in connection with the project GEO-2000, should be interpreted in the light of specific conditions of the Caucasian region. The other group will include the most urgent (present-day) recommendations that should be put into practice in the near future, and for most of which financing is required as rapidly as possible.

5.2.1 General Recommendations

In accordance with the GEO-2000 Report, UNEP's recommendations are to focus on four key directions in the future, consequently to:

- Eliminate gaps in knowledge;
- Address the root causes;
- Apply an integrated approach;
- Mobilize efforts.

There are linkages among these directions, such that success in one will influence the rest and, on the contrary, an unsuccessful solution to one of these proposals would lead to negative effects in the other fields of activity. It is useful

to examine how these directions are interpreted in the context of the Caucasian region.

Elimination of Gaps in Knowledge. Along with the recommended measures proposed in GEO-2000 (definition of the set of indices for the determination of the state of environment, selection and collection of global assessments on sustainable development, improvement of monitoring and data standards and others), the following issues are also very current for the Caucasus:

- Elaboration of concerted (coordinated, agreed) methodology of monitoring of the state of environment and creation of a common network of ambient monitoring in the countries of the Caucasus region. Establishment of monitoring systems should also include the development of quality assurance and quality control systems, which will guarantee data reliability and validity.

- Elucidation of the issues on how the state of the environment of one region affects the state of another, for example, defining the directions of prevailing winds and their role in the pollution of the environment of neighboring regions, defining the effects of transboundary rivers on the state of environment, study of the new transport corridors and how they contribute to pollution of the environment.

- How global processes affect the state of environment of the Caucasus, and the assessment of the role of the Caucasus in the global environmental processes.

- Study of the negative experience of environ mental pollution in the former Soviet Union, with the purpose of preventing similar mis takes in future.

Addressing the Root Causes. In the GEO-2000 report, a number of generally recommended activities of a global nature are proposed: limiting population size, changing consumption patterns, increasing the efficiency of resource use and carrying out structural transformations in economies. As this study showed, currently in the Caucasus, these original (primary) reasons for environmental degradation and pollution are being transformed in a specific way. This is connected with the fact that the processes of environmental change in the Caucasus very often differ from global trends. For example, in a number of areas of the Caucasus, the population is decreasing and the problems of de-population come to the foreground, contrary to over-population. Due to the economic decline, environmental pollution has significantly declined. But at the same time, impoverishment of the population has increased and new negative forms of environmental impacts are emerging. This could very well be illustrated by the illegal woodcutting that has caused significant degradation of forests in a number of areas of the Caucasus. The absence of finances for restructuring of enterprises led to the shutdown of a number of mining enterprises (e.g. output of coal in Tkibuli, manganese in Chiatura, etc.), which resulted in large-scale unemployment in these districts and sharply aggravated the social situation, not only in these locations but also in neighboring cities, particularly in the capitals (high crime rate, problems connected with unemployment). It was not only armed conflicts that negatively affected the Caucasus, but the consequences of these conflicts which were no less serious. It should be recalled that at present, various types of migrants (refugees, internally displaced people) constitute 12% of the population of the Caucasus.

Application of an Integrated Approach. The application of an integrated approach is particularly important for such a complex and diverse region as the Caucasus. Actually, any reasonable measures aimed at protecting the environment applied in the past were based on an integrated approach. Scientific schools of the former Soviet Union were characterized by a high degree of complexity in research and studies. Thus, achievements of landscape studies in physical geography were both remarkable and highly successful. In ecology, this led to the development of bio-geocineology and economic geography, and teaching on "territorial-industrial complexes". Certainly over the last ten years a significant decline in scientific research has taken place. However, there still exists sufficient human resources capable of applying such an integrated approach for environmental protection activities, on the basis of the past rich experience, combined with the latest developments in Western countries.

Mobilization of Efforts. Mobilization of efforts assumes the involvement of all stake-

holders (individual citizens, communities and NGOs, the private sector, national authorities and others) in the elaboration and implementation of measures for environmental protection. Environmental awareness is one of the most important issues for the Caucasus. Hence, it is particularly important to assure access to information on environmental protection and encourage the mass media to pay attention to environmental protection to the same or greater extent as is devoted to issues such as crime, politics, sports and finance.

In addition to the above recommendations, three additional ones of a general nature, addressing the major needs of all Caucasus countries can be drawn, based on this study of the region's environmental outlook:

- **Institutional strengthening** in the field of environmental management, including staff training, development of modern communication and information systems and decision-making support tools;

- **Capacity building** for implementing international treaties and conventions;

- **Regional cooperation** towards harmonization of legal/institutional settings, as well as managing shared resources and natural and human-related disasters.

5.2.2 Specific Recommendations

Along with general recommendations, there are as well a number of specific ones that should be considered due to their importance, and which require prompt responses. These recommendations may be seen as proposals for specific projects directed at improving the study of the state and trends of the Caucasus environment. Implementation of these recommendations would, without any doubt, greatly contribute to the improvement of environmental protection activities for the Caucasus as a whole.

1. **Creation of a common GIS and information retrieval system for the Caucasus.** Presently, GIS development is being carried out in all Caucasus states. However, the countries are applying different methodologies and in varying degrees of detail. Therefore, the elaboration of a common GIS protocols seems particularly urgent, and would assist in providing continuous monitoring of the state of the Caucasus environment. The creation of a common GIS for the entire Caucasus region is therefore highly recommended.

2. **Study of the effects of armed conflicts and natural disasters on the Caucasus environment.** Both are very important driving forces for the Caucasus environment. On the one hand, it is necessary to study their direct impacts (effects of bombardments, forest fires, landslides, avalanches, etc), and on the other hand their indirect effects (consequences related to refugee flows and internally displaced persons).

3. **Study of new "hot-spots" and creation of a current environmental atlas of the Caucasus.** New "hot-spots" have appeared in the Caucasus caused by local concentrations of environmental pollution in these areas. These "hot-spots" should be identified and mapped, and environmental maps or even an environmental atlas should be produced showing the present state of the Caucasus environment.

4. **Carrying capacity of landscapes.** One current complex and interesting issue is the carrying capacity of landscapes; i.e., what is the maximum population, and what intensity of economic activities, can the natural environment of a given region endure. It is well-known that the dramatic consequences of the heavy precipitation in Ajara in 1989 were connected not only with natural processes, but also with the over-population in the mountainous areas there.

5. **Elaboration of a common network of protected areas.** The difference should be drawn between the notion of a network or set of protected areas, and a more complex and nested system of protected areas comprised of different hierarchical categories. In this respect, the existing categorisation in a number of Caucasian states (preserve - national park - order or "zakaznik") is no longer up-to-date. New designations such as "protected landscape", "natural monument", "multi-purpose use area" (and other units if possible) should be brought into a single unified system, which would create a common, inter-related infrastructure of Caucasus protected areas. This connection should in

particular also be carried out with the help of ecological corridors, thus enabling fauna (and flora) to move freely between and with in the various protected areas of the Caucasus.

6. **Conducting an inventory and assessment of the Caucasus landscape and biological diversity, and developing a Caucasus "Red Book"**, including unique landscapes and flora and fauna requiring conservation and protection:

   - Creating, designing, mapping and developing a database on pristine and relatively unchanged landscapes of the Caucasus. Thus far, few if any data are available on pristine landscape areas. It is necessary to define and carry out an inventory of these areas, and assess the potential dangers of their loss and degradation.

   - Studying biological and landscape diversity within the protected area's net work. The inventory and assessment of individual flora and fauna species, as well as ecosystems and landscapes, should be performed within the defined protected areas. Databases and GIS for protected areas also ought to be estab lished.

   - Performing a detailed landscape and environmental assessment of areas where intense forest cutting is expected. The World Bank Forestry Development Project is expected to result in increased harvesting. It is important to ensure that these activities do not lead to serious or even minor landscape degradation. Therefore, proposed har vesting areas should be inspected in terms of potential environmental conse quences. Areas with fragile or unstable landscapes should be excluded from active forest exploitation.

7. **Deserted areas, de-population, demo graphic decline ~ self-recovery of ecosys tems and natural landscapes**. Contrary to the global trend of population growth, in a number of areas of the Caucasus, de-popula tion has become the dominant phenomenon over the last ten years. This is accompanied by specific processes of "abandonment" of these areas. Such processes are clearly seen in Racha, e.g., where the population (com pared to the beginning of the 20th century) has declined by a factor of six, and many areas previously covered with vineyards and orchards are at present covered with thick pine forests or brushwood. Similar process es are observed in Abkhazia and Karabakh, where armed conflicts and consequent streams of refugees have resulted in vast abandoned areas.

8. **Conducting an inventory of historical and natural heritage**, since the Caucasus has a very rich historical and natural heritage, which are closely inter-related with one another.

9. **Raising public awareness about and par ticipation** in environmental matters, and improving the current level of enforcement of environmental legislation, should also be Caucasus regional priorities. This could be done, inter alia, through the greater involve ment of existing civil society institutions such as the Regional Environmental Centres (REC) for the Caucasus and Russian Federation.

10. **Poverty in the Caucasus and its linkages to environmental problems.** During the Soviet era, the Caucasus was one of the best-developed and flourishing regions of the Soviet Union. Since 1990, the situation has significantly changed, with over half of the population currently living below the poverty line. It would thus be interesting to study how poverty influences the use of nat ural resources and impacts on the state of the environment.

11. **Study of how finances already invested contribute to improving the Caucasus state of environment**, since significant funds have already been invested in environ mental activities. For example, over the last ten years a considerable amount of money (over US $10 million) has been invested for the creation of Borjomi-Kharagauli and Kolkheti National Parks and their adjacent territories. It would be most interesting to study how these investments have improved the state of the environment there, what the effects have been and how these have occurred.

12. **Transition from regional to local level.** A deepening of the GEO process could involve a transition from the global to a sub-regional level. This first CEO report was conducted at a regional level. However, more detailed research, including a transition from the regional to a local level (i.e., individual administrative districts and even communi ties (selsovets) may hold additional interest for better understanding the underlying driv ing forces of environmental change. This level of analysis in turn would offer the basis for an interesting local-to-regional syn thesis, and help to clarify the impact of local peculiarities on the development of regional and global processes and trends.

13. **Impact of TRACECA, pipelines and new industrial infrastructures on the environ ment.** The Caucasus during the Soviet era was an isolated region, totally cut-off from neighboring countries and having no trans port communications. At present, the situa tion has fundamentally changed, with the Caucasus as a transport corridor attracting growing interest. The study of the impact of this corridor on the environment, as well as of new industrial infrastructures, would be of great interest.

14. **Finally, assuring the sustainability of the CEO process** by establishing a regional cen tre, or strengthening an existing one, for this purpose. Such a centre could take on the role of supervising/implementing the ongo ing CEO reporting process, and/or the responsibility for seeing recommendations suggested in the CEO are moving forward and being implemented in the Caucasus region.

5.3 Final Synopsis

This first Caucasus Environment Outlook report has demonstrated that the region faces significant environmental challenges in relation to future economic and human development. Political processes in the new states of the Caucasus also remain frail due to a broad number of factors. But the focus of the current Report is the regional environmental situation, for which the economy and human society are seen from the perspective of "background" or "underlying factors". These nevertheless help to determine both the current environmental state of, and future environmental trends in, the Caucasus.

It has been clearly shown that the Caucasus region as a whole has a unique environmental endowment, recognised since ancient times, and which merits an array of efforts to defend and preserve it from the harsher impacts of economic development and human society. The panoply of cultural and ethnic diversity, natural landscapes (or ecosystems) and relatively elevated levels of biodiversity found in the Caucasus are all major reasons for keeping a close eye on potential environmental impacts of current and future development processes in the region, and taking measures to see these are minimised. The eventual global impacts of Caucasus regional environmental changes should also be kept in mind.

In many ways, the current environmental situation of the Caucasus is both rather advantageous, and anomalous, vis-à-vis other regions of the world. Due to low (and in some cases declining) population levels outside of the few major cities and towns, human pressures on the landscape are generally low. Where they are present, they are typically exerted locally, and because of the generally poor economic situation, are often related to human poverty and the need to extract and use natural resources on an individual basis for survival. Thus, one can foresee that with a return to economic prosperity (as the region knew in the past), that such local exploitation would be greatly reduced or cease altogether.

On the other hand, some recent developments are perhaps a real threat to the regional environment, if they would be carried to their logical (and purely economic) extreme and without proper consideration for the surrounding environment. With the opening up of the region overall and current possibilities for the South Caucasus in particular to become one of transit for both goods and people, there are sure to be rising pressures exerted in the form of construction (roads, railways, pipelines) and transport (cars, trucks, trains and pumping of oil and gas). If such related developments are carried out without due regard for the natural environment, it is all but certain that increased pollution of air, land and waters will take place. While the economics of today may tend to give

a "push" to such development in order to improve the living situation of Caucasus citizens, it is hoped that serious mistakes which might compromise their futures can be avoided in the process.

Thus, the major challenge of the moment is that faced by many peoples and regions of the world: how to create further economic development, which can better the living standards for the greatest number of persons in the Caucasus, without seriously or even irreparably damaging local environments on which all depend for basic "life-support" systems? The unique beauty and diversity, and relatively unspoiled nature of the Caucasus region, can only serve to reinforce the timeliness of this question.

ACRONYMS AND ABBREVIATIONS

ACCO	Agreement on the Conservation of Cetacean of the Black Sea, Mediterranean Sea and Contiguous Atlantic Areas
BAT	Best Available Technology
BOD	Biological Oxygen Demand
BS-AP	Biodiversity Strategy and Action Plan
BSEP	Black Sea Environmental Program
BUWAL	Swiss Agency for Environment, Forests and Landscape
^{0}C	centigrade degree
CAID	Canadian Agency for International Development
CBD	Convention on Biological Diversity
CEE	Central and Eastern Europe
CENN	Caucasus Environmental NGO Network
CEO	Caucasus Environmental Outlook
CIP	Centre for International Programmes
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CLD	Convention on Liability for Oil Pollution Damage
cm	centimetre
CMS	Convention on the Conservation of Migratory Species and Wild Animals
Co	Cobalt
COD	Chemical Oxygen Demand
CO_2	Carbon dioxide
CO	Carbon monoxide
COWI	Consulting Engineer
Cs	Cesium
DAI	Development Alternative Incorporated
DDE	Dichlorodiphenylethane
DDT	Dichlorodiphenyltrichloroethane
EAP	Environmental Action Plan
ECE	Economic Commission for Europe
EIA	Environmental Impact Assessment
EMAS	Environmental Management Systems
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FSU	Former Soviet Union
g	gram
GCCW	Georgian Centre for the Conservation of Wildlife
GHG	Green House Gases
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GEO	Global Environment Outlook
GIOC	Georgian International Oil Corporation
G.Info	Geographic Information Centre of Georgia
g/kg	gram per kilogram
g/l	gram per litre
GRID	Global Resource Information Database
GOST	Gosudarstveniy standart (State Standard)
GTZ	Deutsche Gesellschaft für Zusammenarbeit (German Agency for Technical Cooperation)
ha	hectare
-HC-	Hydrocarbons
HMS	Hydro-meteorological Service
IBA	Important Bird Area
IDP	Internally Displaced Person
IFRCRCS	International Federation of Red Cross and Red Crescent Societies
IMO	International Maritime Organisation
ISAR	Initiative for Social Action and Renewal in Eurasia
IPCC	Intergovernmental Panel on Climate Change
IPPC	Integrated Pollution Prevention and Control
IUCN	International Union for Nature Conservation
JSC	Joint-Stock Company
kcal	kilocalorie
kcal/cm sq.	kilocalorie per square centimetre
kg	kilogram
kg/ha	kilogram per hectare
KfW	Kreditanstalt für Wiederaufbau
km	kilometre
km^3	cubic kilometre
km^2	square kilometre
km sq.	square kilometre
kW	kilowatt
kW/h	kilowatt per hour
l	litre

LDC	London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters
Ltd	Limited
m	metre
m^2	square metre
m^3	cubic metre
m^3/s	cubic metre per second
MAC	Maximum Allowable Concentration
MARPOL	International Convention for the Prevention of Pollution from Ships
mg	microgram
mg/kg	microgram per kilogram
mg/l	microgram per litre
ml	milligram
ml/l	milligram per litre
mln	million
MNP	Ministry of Natural Protection
MoA	Ministry of Agriculture
MoE	Ministry of Environment
MoH	Ministry of Health
MSK	Medvedev, Sponheuer and Karnik intensity scale
NACRES	Noah's Ark for the Recovery of Endangered Species
NARSD	National Assessment Report for Sustainable Development
NATO	North Atlantic Treaty Organisation
NORCE	Norwegian Consortium for Energy and Environment
NEAP	National Environmental Action Plan
NGO	Non-governmental Organization
NIS	Newly Independent States
NOx	Nitrous oxides
O_3	Ozone
OECD	Organisation for Economic Co-operation and Development
O/M	Operation and Maintenance
Pb	Lead
PC	Personal Computer
PCB	Polychlorinated biphenyls
PM10/2.5	Particulate Matters with aerodynamic diameter less than 10/2.5 microns
POJA	Program of Joint Action
POPs	Persistent Organic Pollutants
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
REC	Regional Environmental Centre
RF	Russian Federation
ROE	Regional Office for Europe
SEE	State Ecological Examination
SIBE	Memorandum of Understanding Concerning Conservation Measures for the Siberian Crane
SO_2	Sulphur dioxide
SS	suspended solids
t	ton
t/km	ton(s) per kilometre
t/km^2	ton(s) per square kilometre
TAC	Total Allowable Catch
TACIS	Technical Assistance to the Commonwealth of Independent States
TN	Total nitrogen
TP	Total phosphorus
TRACECA	Transport Corridor Europe-Caucasus-Asia
TSP	Total Suspended Particulates
UN	United Nations
UNCCD	UN Convention to Combat Desertification
UNDP	United Nations Development Programme
UN-ECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Programme
UNEP/DEWA	UNEP's Division of Early Warning and Assessment
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
USAID	United States Agency for International Development
US$	US dollar
USSR	Union of Soviet Socialistic Republics
VOCs	Volatile organic compounds
WB	World Bank
WHO	World Health Organisation
WWF	World Wide Fund for Nature
yr	year
Zn	Zinc

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