

Legal and Institutional Frameworks for Sustainable Soils

A Preliminary Report

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Ian Hannam with Ben Boer

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Table of Contents

Foreword	ix
Acknowledgments	xi
Summary	xiii
Section 1	1
I. INTRODUCTION	3
1. Methodology	3
2. The Amman Resolution on Soils	4
3. Terms of Reference of this Report	5
4. The Montevideo Programme III	5
5. Specific Requirements for Soil Law Reform	6
Section 2	7
II. BACKGROUND	9
1. Soil and People	9
2. What is Soil?	9
2.1 Functions of Soil	10
2.1.1 Natural Functions of Soil	10
2.1.2 Cultural Functions of Soil	11
2.1.3 Land Use Functions of Soil	11
3. The Nature of Soil	11
4. Soil Degradation	12
5. Land Degradation	14
6. Soil Conservation	14
7. Soil and the Environment	16
7.1 Environment	16
8. An Ecosystem-Based Approach	17
9. Sustainability	18
9.1 Concepts of Sustainability	18
9.2 The World Commission on Environment and Development – The Brundtland Report	18
9.3 Sustainable Land Management	19
10. The Sustainable Use of Soil	20
10.1 The Sustainability Dilemma	20
11. Ecological Integrity of Soil and the Need for Ecological Soil Standards	22
12. Role of Soil Institutions	23
13. Soil Science Organisations	23
Section 3	25
III. NATIONAL SOIL REGIMES	27
1. Soil in Other Resource-Oriented Legal Regimes	28
2. Legal Frameworks	29
3. Globalisation and Legal Protection for Soil	30
4. Significant Scientific Factors to Consider in the Development of Successful Legal Frameworks for Soil Law	30

Section 4	33
IV. NATIONAL LEGAL AND INSTITUTIONAL FRAMEWORKS	35
1. Existing National Soil Legal Frameworks	35
2. Soil Legislation Framework Categories	36
2.1 Principal Soil Conservation Law	36
2.2 Protecting Land for Soil Conservation Purposes	37
2.3 Protecting Soil in Forestland and Agricultural Land	37
2.4 Legislation Specifically for Soil Erosion Control	38
2.5 Legislation Specifically to Manage Soil Pollution	39
2.6 Legislation to Establish Soil Conservation Committees and Boards	39
2.7 Legislation to Establish Soil Conservation Institutions or an Authority	39
2.8 Miscellaneous Category	40
3. Overview of National Soil Legislation	40
4. A Way Forward to Improve National Soil Legislation	41
4.1 Natural Rights for Soil	41
4.2 The Public Trust Doctrine	42
4.3 The Precautionary Principle	42
4.4 Conservation of Biological Diversity	42
4.5 Definitional Issues	42
5. Principles of National Soil Legislation	43
6. Broad Strategy	44
6.1 Non-Regulatory Strategies	44
6.2 Regulatory Strategies	45
7. An Analytical Process	45
7.1 The Background Analysis	46
7.1.1 Physical Environment	46
7.1.2 Existing Legal Framework	46
7.1.3 Review of Institutions	46
7.2 Interpretation of the Background Issues in a Land Management Context	46
7.3 Developing the Law for Sustainable Use of Soil	46
7.3.1 Key Aspects	46
7.3.2 Develop an Approach	46
7.4 Key International Principles	47
7.5 Developing Reform Profiles and Options	47
7.5.1 Framework 1 – Work with an Existing Soil Law	47
7.5.2 Framework 2 – Develop New Soil Legislation to Promote the Role of the State in Sustainable Use of Soil	48
7.5.3 Framework 3 – Develop Soil Legislation Based on the Concept of Ecosystem Management	48
7.5.4 Framework 4 – Integrated Resource Management Law in which Soil is a Principal Component	48
8. The Community	48
8.1 An Outline of Current Soil Degradation in the State	49
8.2 A Description of the Soil Problems and Land Management Issues	49
8.3 An Outline of the General Obligations of States to Sustainable Use of Soil and Ecological Sustainability	49

8.4	The Specific Role of the Community	50
8.5	The Role of Government and Relevant Agencies and Institutions	50
8.6	Promotion of the Concept of a National Soil Strategy	50
8.7	Suggest an Approach to Soil Policy Development, Embracing the Theme of Sustainable Use of Soil	50
8.8	Invitation	51
9.	Examples of National Reform	51
10.	Principal Elements for National Soil Legislation	53
Section 5		55
V.	INTERNATIONAL LEGAL AND INSTITUTIONAL REGIMES FOR SOIL	57
1.	Existing Regimes	57
2.	The Nature of International Instruments: Binding and Non-Binding Legal Instruments	58
2.1	Binding Instruments	58
2.2	Non-Binding Instruments	58
3.	Multinational Environmental Treaties and Other Agreements	59
3.1	Non-Binding International Instruments	59
3.1.1	The Stockholm Declaration	59
3.1.2	The Rio Declaration and Agenda 21	59
3.1.3	The World Charter for Nature	60
3.1.4	The European Soil Charter	60
3.1.5	The World Soil Charter and the World Soils Policy	61
3.1.6	The World Conservation Strategy	61
4.	Binding Instruments	62
4.1	Conventions	62
4.1.1	Convention to Combat Desertification	62
4.1.2	Convention on Biological Diversity	63
4.1.3	Framework Convention on Climate Change	64
4.1.3.1	Kyoto Protocol	65
4.2	Regional Binding Instruments	66
4.2.1	Convention for the Protection of the Natural Resources and Environment of the South Pacific Region	66
4.2.2	African Convention for the Conservation of Nature and Natural Resources	66
4.2.3	Convention Establishing a Permanent Inter-State Drought Control Committee for the Sahel	67
4.2.4	Benelux Convention on Nature Conservation and Landscape Protection	67
4.2.5	Convention for the Protection of the Mediterranean Sea Against Pollution	67
4.2.6	Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean	68
4.2.7	Convention Concerning the Protection of the European Alps	68
4.2.7.1	The Protocol for the Implementation of the Alpine Convention of 1991 in the Area of Soil Protection	68

4.2.8	The ASEAN Agreement on the Conservation of Nature and Natural Resources	69
4.2.9	Agreement for the Establishment of the Arab Centre for the Studies of Dry and Barren Land	70
5.	Other Initiatives Relevant to Soil	70
5.1	The Forest Principles	70
5.2	Draft International Covenant on Environment and Development	70
5.3	A Non-Government Initiative for a Binding Instrument for Soil – The Tutzing Proposal	71
6.	Issues Related to Responsibility and Liability under International Law	72
7.	Overview of Existing International Regime	72
8.	An International Environmental Law Framework for Soil	73
9.	The Case for a Specific International Soil Instrument	73
10.	Options for Legal Frameworks for Soil	74
10.1	A Binding Instrument as a Specific Framework for Soil	75
10.1.1	Treaty	75
10.2	Non-Binding Instrument	75
11.	A Process	76
12.	Suggested Elements for an International Framework for Soil	77
12.1	Elements that Create an Obligation to Conserve Soil at the Global Level	77
12.2	Elements that Create Obligations Between the Global Level and the States	78
Section 6		79
VI.	CONCLUSIONS	81
1.	General Conclusions	81
2.	Specific Conclusions	82
3.	Some Options	83
3.1	National	83
3.2	International	83
3.2.1	Binding Instrument Options	83
3.2.2	Non-Binding Options	83
Section 7		85
VII.	RECOMMENDATIONS	87
Seven Principal Actions Recommended		87

Foreword

The IUCN Environmental Law Programme (ELP) welcomes the publication of this groundbreaking work. It stands as testament to the untiring efforts of the IUCN Commission on Environmental Law (CEL) Sustainable Soils Specialist Group. Furthermore, it demonstrates in a very tangible way how members of this volunteer network of over 800 environmental law specialists from all over the world are contributing to meeting the challenge of:

“laying the strongest possible legal foundation at the international, regional and national levels for environmental conservation in the context of sustainable development.”

IUCN ELP Mission

This book was produced through the collaboration of the Environmental Law Centre (ELC) and CEL, which work together to deliver an integrated global environmental law programme. The ELC is proud to be associated with this work, and with good reason. The extensive survey of national, regional and international instruments relating to the sustainable use of soils that was carried out for this work was significantly assisted by the use of the ELC’s environmental law and policy library, one of the most comprehensive in the world.

The legal and scientific communities have not been amiss in pointing out the general inadequacies in soil legislation and policy. This action-oriented, multi-level and inter-disciplinary study takes up these observations, fleshes them out through specific examples, evaluates some current efforts, and provides initial answers to the difficult questions we need to tackle. The book thus lays the foundation for future work and dialogue to deal with a universally recognised problem.

It is our hope that the recommendations in this book will be taken up by all stakeholders in the soils debate and that it will serve to stimulate concrete steps to promote the sustainable use of soils.

*John Scanlon
Head, IUCN Environmental Law Programme
Director, IUCN Environmental Law Centre*

Acknowledgments

This report is the outcome of an effective partnership between the environmental law and soil science disciplines, specifically the IUCN Environmental Law Programme (ELP) and a number of the key global soil science institutions, including: the International Union of Soil Sciences (IUSS); the World Association of Soil and Water Conservation (WASWC); the European Soil Bureau (European Commission) (ESB); the Foundation Charles Leopold Mayer (FCLM); the International Soil Reference and Information Centre (Wageningen, The Netherlands) (ISRIC); and the International Board for Soil Research and Management (which became part of the International Water Management Institute in April 2001) (IBSRAM).

We wish to acknowledge the assistance of many people in the preparation of this report. First, thanks go to Professor Nicholas Robinson, Chair of the CEL, and his support and encouragement in establishing the sustainable use of soils project. A special thanks goes to Dr Françoise Burhenne-Guilmin, Senior Counsel, IUCN Environmental Law Centre (ELC), for insightful comments in framing the report and constructive comments during its preparation, and the continuing work of ELC lawyer Dr Alejandro Iza as the ELP focal point for the project. The editorial comments and general comments on the direction of the report by the members of the CEL Sustainable Soils Working Group (SSWG), Professor Antonio Herman Benjamin and Lyle Glowka, are gratefully acknowledged. We also very much appreciate the editorial work of ELC lawyer Maria Socorro Manguiat.

Special thanks also go to Annie Lukács and Alexandra Fante of the ELC for assistance with background research and database materials and to Ann DeVoy for translation services. Thanks also to Charles di Leva, former Head for the Environmental Law Programme, and to John Scanlon, the new Head of the Programme, for his continuing support.

We gratefully acknowledge the constructive critique and encouraging comments from the soil science specialists of the expert reference group to the SSWG, including Professor Winfried Blum (IUSS), Dr Luca Montanarella (European Soils Bureau), Mr Sjef Kaufman (ISRIC), Dr Frits Penning deVries (IBSRAM), Professor Hans Hurni (WASWC and IUSS), Professor Rabah Lahmar (FCLM) and Dr Martin Held (representing FCLM). Special mention should also be made of David Sanders (President WASWC) and Dr Roel Oldeman (Director, ISRIC) for their institutional support and support from the Department of Land and Water Conservation, NSW, Australia.

Finally, the financial support for the project from the European Soil Bureau and the Foundation Charles Leopold Mayer was a vital contribution to bringing the project to this stage, and is gratefully acknowledged.

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Sustainable Soils Specialist Group, IUCN Commission on Environmental Law*

October 2002

Summary

Introduction

The primary objective of this report is to consider the treatment of soil-related issues in both national and international environmental law, and draw conclusions on needs at both levels. In exploring this subject, the report is mindful of the Resolution of the IUCN World Congress October 2000 Amman which requests the IUCN Environmental Law Programme (ELP), in the development of its legal guidelines, explanatory material and investigation into a global legal instrument for the sustainable use of soils, to pay particular attention to the ecological needs of soil and their ecological functions for the conservation of biodiversity and the maintenance of human life. Also taken into account are the objectives of the United Nations Environment Programme (UNEP) Montevideo Programme III – the Programme for the Periodic Review of Environmental Law for the Twenty-First Century, decided by the Governing Council of UNEP in February 2001, and in particular Objective 12 which is directed to improving the conservation, rehabilitation and sustainable use of soils.

Methodology

The methodological approach taken by the report includes:

- Overviewing the technical issues and ecological functions of soils to clearly establish the basic premise of the report. Some issues that influence national soil regimes are examined (section 2).
- Overviewing national soil legislation regimes, concluding with a summary of the important scientific factors to consider in the development of effective legal frameworks for soil (section 3).
- Overviewing national legal and institutional frameworks for soil, including a review of existing national soil legislation frameworks, followed by an outline of the elements needed for effective national soil legislation (section 4).
- Overviewing the international legal and institutional regimes for soil within the framework of binding and non-binding instruments, including global and regional instruments. Various options are canvassed to indicate the types of instruments that might be suitable for soil at the global level (section 5).
- Drawing a number of general and specific conclusions (section 6).
- Presenting a set of recommendations (section 7).

Sustainable Use of Soil

The term “sustainable use of soil” is defined here as *“the use of soil in a manner that preserves the balance between the processes of soil formation and soil degradation, while maintaining the ecological functions and needs of soil”*. The phrase “use of soil” indicates *“the role of soil in the conservation of biodiversity and the maintenance of human life”*. The dilemma for soil is that, on the one hand, it is a basic ecological component of terrestrial ecosystems, and on the other hand, it is one of the three essential elements (with water and air) on which humans depend for the maintenance of their life. This dilemma, which is further compounded by definitional problems associated with the term “sustainability” and the need to integrate social, economic, or ecological objectives to achieve sustainability underlie the preparation of this report.

Current Situation: National

A survey of the existing national soil legislation indicates that States have adopted a variety of approaches to frame domestic soil legislation in order to deal with specific soil protection and land management problems. This is reflected in the broad characteristics that underlie the eight categories of national legislation to protect and manage soil. The global picture is that States have been quite innovative in the choice and application of individual mechanisms. However, the dominant characteristic is that the national soil legislation is very much overshadowed by the physical problems that arise from land use (i.e. there is too much private interest and insufficient public interest manifested in the legislation). Only a few States have a law that refers to the ecological features or needs of soil, or its role in the conservation of biological diversity. Many individual laws do not have a clear statement of purpose or objectives, and in other cases, the stated intention of the legislation is poorly reflected in the substantive provisions of the legislation. Some States have developed a framework of legislation to manage a number of distinct soil and land use problems but they generally lack a linking or coordinating mechanism.

Current Situation: International

At a global level, existing binding instruments are insufficient as a framework to meet the objective of sustainable use of soil. They do not include anywhere near a sufficient range of legal elements needed to protect and manage soil in a sustainable way at the global level. Although the current international non-binding instruments for soil include some general conceptual material that is still relevant in the 21st century, they fail to recognise soil as an essential element of terrestrial ecology and they do not include the environmental law concepts and elements needed to achieve the sustainable use of soil. An examination of regional binding instruments presents a different picture. A number have specific articles for soil as well as other articles that support an objective of the sustainable use of soil. However, some of the more important regional instruments are not yet in force such as the Protocol on the Implementation of the Convention concerning the Protection of the Alps of 1991 in the area of Soil Protection. This instrument takes on additional significance in that it is the only “binding instrument” in the world specifically for the protection of soil and in this context is regarded as a stimulus for the overall improvement of the global and national law for soil, as the existing international environmental law regime does not provide specific guidelines for States to approach the reform or development of national soil legislation.

The Way Forward

The national and international inadequacies become more apparent when the existing regimes are compared with the thrust of the Amman Resolution and the general objectives of environmental law advocated within the UNEP Montevideo Programme III, in particular the type of action that is advocated to improve the effectiveness of environmental law in the areas of implementation, compliance and enforcement, and prevention and mitigation of environmental damage. This report presents ideas for basic elements that could be considered for national and international frameworks. If these, or similar elements, were implemented, this would strengthen the overall environmental law for soil and meet the requirements of the Amman Resolution on soil and the provisions on soil in the Montevideo III Programme. Clearly, an innovative approach to the reform of national and international soil legislation is required to give it the capability to meet the ecological and human needs of soil for the 21st century.

Conclusions

This report concludes that the IUCN ELP, in its consideration of options to promote the needs for environmental law for the protection of soil, should be cognisant of a number of interacting factors, including:

- An awareness of the poor recognition of the ecological characteristics and needs of soil in current international environmental law, and that national soil legislation is generally inadequate to manage the type and severity of soil degradation problems experienced around the world.
- The satisfaction of a high level of recognition in the global soil science community of the benefits of introducing an international instrument to raise the awareness of the serious situation of soil degradation, and the need to develop suitable legal tools for individual nations to use to address the sustainable use of soil. Of greatest concern is the continued high rate of expansion of soil degradation globally and the increase in degree and severity of individual soil degradation processes and that this situation will worsen in the 21st century. The data clearly show that in the immediate future the world will be placing even greater pressure on its soils than it is today, to produce sufficient food to meet the ever-increasing food deficit.
- A general realisation that the world community must take action sooner rather than later to more adequately protect soils in national and international environmental law regimes, as an integral part of the overall framework of environmental law, policy and management.
- A realisation that a number of existing multinational agreements which have specific objectives and responsibilities to improve the condition of the terrestrial environment are not being implemented to their full potential and that this situation may influence the choice of a global instrument for soil.
- The fact that there have been some positive national soil law reforms and that in a few instances new statutes have been either passed or tabled by some national parliaments. These moves have stimulated some other nations, and some regions, to actively seek assistance to develop new national soil law, but they only represent a small portion of the world in number and area.
- The decision to develop national and international soil legislation frameworks must include the provision to develop the accompanying support materials and explanatory guidelines necessary to ensure effective implementation at both levels.

Suggested Options

National

- Preparation of a generic “soil law” or guidelines, consisting of elements for States to draw on when amending an existing statute or when developing new legislation for soil. In the initial instance, it is at the national level that the most direct and fundamental work should be done. However, the work carried out at the national level should be complemented by the development of regional and international guidelines and frameworks, as indicated below.

Regional

- Preparation of regional soil law guidelines for groups of countries in particular regions, to be used in conjunction with the basic generic legal elements developed for the national level regional guidelines could be developed through the various regional agencies responsible for environmental issues, such as the South Pacific Regional Environment Programme, the South Asian Co-operative Environment Program, or with the Association of Southeast Asian Nations (ASEAN) Senior Officials on the Environment (ASOEN). Such guidelines should include a range of specific elements to manage the physical and legal characteristics of the particular region.

International

Binding Instrument Options:

- A specific treaty with all of the essential legal elements for soil.
- A framework treaty, which identifies the soil elements in existing treaties and links them through a separate binding instrument. The new instrument would contain additional, specific legal rules for soil.
- A protocol to an existing treaty that creates specific rules for soil.

Non-Binding Options:

- An international charter for soil.
- A declaration for soil.

Recommendations

- It is recommended that the IUCN ELP host a meeting of representatives of the principal bodies who have an interest in the general objectives of the SSWG project. The objective of the meeting would be to seek their formal endorsement of the SSWG project, and to canvass opportunities for these bodies to input to the project in the interest of achieving a better overall legal strategy for the sustainable use of the world's soils. The IUCN ELP should invite representatives of the principal bodies consulted and other suitable organisations to make substantive inputs to the project.
- It is recommended that the ELP expand the terms of reference of the SSWG project into a more comprehensive and substantial project within the IUCN as a whole. Formal links would need to be forged with other IUCN Commissions, and with some of the specific program areas of IUCN, including links with the IUCN regions.
- It is recommended that the ELP propose that the IUCN Council request the Director General to develop a specific soil education campaign to raise the awareness of the national and international legal needs of soil and promote the need for the community to adopt an ecologically based paradigm for soil. The ELP would be a key component of this campaign. Such an initiative would support existing initiatives of the global soil science community.
- It is recommended that work continue on the development of the elements for a "generic" national soil statute, but to expand this task to include the development of legal frameworks and/or regional instruments for particular regions of the world.
- It is recommended that the ELP select an appropriate option for an international instrument on the sustainable use of soils as outlined in this report and commence the development of a draft instrument, including the accompanying support and guideline materials for its effective implementation.
- It is recommended that the ELP submit a proposal for a 2-year "sustainable soil law framework" project to potential donors, to seek financial support to further the development of legal and institutional frameworks for sustainable soils, including the "generic" soil law and the regional models.
- It is recommended that the ELP take the appropriate steps to ensure that its initiatives for improved legal and institutional frameworks for sustainable soils is addressed at all relevant international and national conferences and meetings.

Section 1

I. Introduction

In April 1999, the IUCN Commission on Environmental Law (CEL) initiated the establishment of a Sustainable Soils Working Group (SSWG)¹ to investigate the national and international dimensions of the legal protection of soils. The impetus for this Working Group arose out of contacts of CEL members with the principal international soil science organisations that were and continue to be concerned about the need for improved legal protection of soils on a global basis.

This first draft of this report was prepared between March and May 2001 by Dr Ian Hannam, as a Visiting Scholar to the IUCN Environmental Law Centre (ELC), in collaboration with Prof Ben Boer. The objective was to prepare a report that recommends to CEL a number of options for the preparation of national and international legal and institutional frameworks for the sustainable use of soils. After a good deal of comment from members of the soil science community, lawyers within CEL and the ELC, the report was finalised in January 2002.

1. Methodology

The methodological approach taken in this report is to consider the soil-related issues in national and international law and draw conclusions. It is organised into seven sections as follows:

- Section 1 outlines the Amman 2000 Resolution on Soils, the Terms of Reference of this report, the “Soils” objective of the Montevideo Programme III, and the mandate of the CEL Sustainable Soils Working Group.
- Section 2 scopes the key technical and ecological needs of soils² raised in various existing legal and scientific arguments, to establish the basic premise of the report.³ Some issues that characterise national soil regimes are also examined in section 2.
- Section 3 is a brief introduction to national soil legislation regimes and concludes with a summary of important scientific factors to consider in the development of successful legal frameworks for soil.
- Section 4 includes a detailed discussion on the national legal and institutional framework for soil and includes a review of existing national soil legislation frameworks and then considers suitable principles for future national soil legislation.
- Section 5 examines the international legal and institutional regimes for soil within the framework of binding and non-binding instruments. Various options are canvassed, to indicate what type of instrument(s) might be suitable for soil at the global and regional level.
- Section 6 draws general and specific conclusions.
- Section 7 sets out the seven recommendations to the CEL Steering Committee.

¹ All CEL working groups were renamed “specialist groups” at the CEL Steering Committee meeting of January 2002.

² This encompasses the Request of the Amman Resolution that “particular attention be paid to the ecological needs of soils and their ecological functions for the conservation of biodiversity and the maintenance of human life”.

³ The basic premise of the report is taken to be the logic and justification used to formulate the legal and institutional frameworks for the sustainable use of soil, and which lead to the conclusions and recommendations of the report.

2. The Amman Resolution on Soils

The IUCN World Conservation Congress in Amman, Jordan in October 2000, passed a Resolution, which gave the imprimatur of the IUCN to further investigate this issue, and called upon members of the Union to support this work. The text of the Resolution is as follows:

2.59 Legal Aspects of the Sustainable Use of Soils

RECALLING that one of the objectives of the International Union for the Conservation of Nature and Natural Resources (IUCN) since its founding in 1948 was the establishment of laws and treaties for the protection of nature;

RECOGNISING the important contributions made by the IUCN since 1965 towards establishing the field of environmental law;

AWARE that environmental law has become a field of law whose scope is exceptionally broad, ranging from the legal systems of local authorities and the customary law of traditional societies and indigenous peoples, through to the laws of States and the international law among States;

NOTING the significant cooperation and support that exists among the soil science community for the improvement of environmental law and policy for the sustainable use of soils, particularly in regard to the ecological functions of soil for the conservation of biodiversity and the maintenance of human life, including:

- (a) the production of biomass and the filtering, buffering and transformation activity between the atmosphere, ground water and plant cover;
- (b) soils as a biological habitat and gene reserve;
- (c) soils as a spatial base for technical, industrial and socio-economic structures and their development; and
- (d) soils as a source of raw materials,

CONVINCED that the future ecological benefits of the world's soils will depend on the existence of adequate global, regional and national legal strategies to enable individual nations to make sound land use and land management decisions, and on building capacity to communicate these strategies;

CONCERNED that there is a need to study further and make recommendations concerning the synergy among several international environmental instruments of relevance to soils and the patterns of their implementation through national legislation, and

ACKNOWLEDGING that whilst there is a range of international instruments addressing aspects of soil conservation, there is at present no specific global environmental law instrument for the sustainable use of soils;

The World Conservation Congress, at its 2nd session, in Amman, Jordan, 4-10 October 2000:

1. WELCOMES the initiative of the Environmental Law Programme to form a Working Group on the Legal Aspects of the Sustainable Use of Soils to prepare guidelines and explanatory material relating to principles and elements of national legislation and policy to assist States to manage their specific soil degradation and land degradation problems, and to investigate the need for and feasibility of further developing international environmental law in this field, in particular through an international instrument for the sustainable use of soils,
2. INVITES IUCN members to provide all possible support to the Environmental Law Programme in developing guidelines on the essential elements to include in environmental legislation and policy for the sustainable use of soils, and its investigation of a global instrument for the sustainable use of soils;
3. REQUESTS the Environmental Law Programme, in its development of legal guidelines and explanatory material, and investigation into a global legal instrument for the sustainable use of soils, to pay particular attention to the ecological needs of soil and their ecological functions for the conservation of biodiversity and the maintenance of human life.⁴

⁴ The text of the Resolution is directed to both the national and international levels of legal protection. In relation to the international level, the use of the term "international instrument" was deliberately chosen to leave the options for investigation of this area as open as possible.

3. Terms of Reference of this Report

Since the Amman Conference, funds have been made available through the European Soil Bureau of the European Commission and the Foundation Charles Leopold Mayer (Paris) to initiate the work called for in the Resolution. This Report's Terms of Reference are drawn from the CEL SSWG Workplan for 2001 to 2002, and was prepared in response to the outcome of the CEL Steering Committee meeting in April 2000. The Terms of Reference are:

To prepare a Report on Legal and Institutional Frameworks for Sustainable Soils for review by the CEL Sustainable Soils Working Group, the external Sustainable Soils Scientific Reference Group, and by the CEL Steering Committee. The Report will consider the treatment of soil-related issues in both national and international law, and will draw conclusions on needs at both levels.

4. The Montevideo Programme III

The Montevideo Programme III – the Programme for the Development and Periodic Review of Environmental Law for the First Decade of the Twenty-First Century was adopted by the Governing Council of the United Nations Environment Programme (UNEP) in February 2001.⁵ The Program includes a specific Objective for Soils (Objective 12) as part of the new UNEP strategic environmental law programme. The Programme generally includes not only development of international agreements, but also international guidelines, principles and standards, as well as the provision of assistance to develop capacity to formulate and implement these. In this regard, many aspects of the Programme support a general initiative for soil legislation reform, including undertaking actions to:

- Improve the effectiveness of environmental law on soils.
- Improve the conservation and management of soil.
- Forge better links between environmental law on soils and other fields of environmental law.

The full text of Objective 12 for Soils is:

Objective: To improve the conservation, rehabilitation and sustainable use of soils.

Strategy: Promote the development and implementation of laws and policies for enhancing the conservation, sustainable use and, where appropriate rehabilitation of soils.

Action:

- (a) Review domestic land use laws, change of land use laws and tenure systems with the aim of achieving soil conservation and reclamation goals;
- (b) Promote the integration of soil conservation measures into relevant domestic laws, taking into account, where appropriate, relevant international instruments such as the United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD).

It is relevant to note that the terms of reference of this Commission on Environmental Law project are generally consistent with Objective 12 "Soils" of the Montevideo Programme III.

⁵ Decision 21/23 of the 2001 Governing Council of UNEP, February 2001.

5. Specific Requirements for Soil Law Reform

In preparing this report it emerged that complex scientific, social, cultural and economic issues need to be taken into account when developing or strengthening legal frameworks to prevent soil degradation and to achieve sustainable use of soil. It is now acknowledged that soil degradation is predominantly a human-induced problem and over the past century humans have made substantial changes to land use methods as a response to the continual expansion and increase in severity of the degradation. However, the main pressure has come from the effects of the dramatically increasing population level, bringing new and greater demands on the soil. Under this pressure, many of the old land use technologies have failed and vast tracts of land have been degraded and even abandoned. Governments have responded to these losses in various ways. Conservation policies have been formulated and large-scale soil conservation programs have been mounted in many parts of the world. The results have been mixed, and far too many have ended disappointingly. The reasons are complex, but it is widely acknowledged that it is necessary to have effective legislation if the world is to achieve the sustainable use of soil.⁶ It is predicted that the global and regional trend for soil degradation is likely to worsen in the 21st century.⁷

In regard to this report, careful attention has been paid to the links between the specific requirements of the Amman Resolution, the objectives of the Montevideo Programme III, and the specific terms of reference for this report. To effectively consider the soil-related issues in national and international law, careful attention is focused on the ecological needs of soil and their ecological functions for the conservation of biodiversity and the maintenance of human life. An adequate understanding of this important relationship is needed as a basis to suggest appropriate frameworks for the development of legal rules for soil and the feasibility of introducing particular framework options.

The legal approaches set out in this report have been particularly influenced by the problems identified by the scientific community in the decade since the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992.⁸ In direct response to the land degradation problem raised at UNCED, the soil science community established the concept of an “International Conference on Land Degradation” (ICLD), with an objective to hold an ICLD every few years as a process to monitor the global changes in land degradation, particularly soil degradation and desertification, and review the responses of the world to this problem. There have been three ICLDs since 1992, the first in 1995 (Adna, Turkey), the second in 1999 (Kohn Kaen, Thailand) and the third in September 2001 (Rio de Janeiro, Brazil). The text *Response to Land Degradation* was specifically produced as a “state of the art” documentation of the global picture of land degradation to the end of the 20th century and sets out a blueprint for the 21st century.⁹

⁶ As advocated in DEZA and GTZ, 2000, *Living with the Soil: Soil – A Foundation for Sustainable Development*, on p. 21.

⁷ United Nations Environment Programme, *Global Environment Outlook 2000*, Earthscan Publications Ltd, London; see Chapter 4, “Future Perspectives”.

⁸ See Bridges, E.M., I.D. Hannam, L.R. Oldeman, F. Penning deVries, S.J. Scherr, and S. Sombatpanit, 2001, Eds., *Response to Land Degradation*, Science Publishers Inc, Enfield, (N.H), USA.

⁹ See op. cit. Bridges *et al.*

Section 2

II. Background

1. Soil and People

The effects of the increase in human population on the world, especially in terms of the decline in food security, indicates that soil has ecological limits and that these limits vary according to the variations within different ecosystems and the cultural relationships with the land and soil resources. There is an increasing imbalance in the production of food due to the difference in the rate of deterioration of soils and their functions and the rate of their regeneration. This situation requires an in-depth reconsideration of human attitudes to natural resources in general, but to soil in particular. This challenge has been taken up by the principal soil science organisations,¹⁰ as well as other important initiatives such as the global *Soil Campaign* of the Foundation Charles Leopold Mayer,¹¹ which is attempting to create an awareness and knowledge of soil among all humans, where the main objectives are to:

- Change the attitude of humans about the vital importance of soils.
- Remind humans that soil is the foundation of human development and has a major role in sustaining societies.
- Raise the “status” of soil by advising governments of the world of the way to manage their soil as a non-renewable resource.
- Build the foundations of an international front against soil deterioration.

However, to successfully achieve these objectives, the international community will require national and international frameworks for soil legislation that are based on a clear understanding of the confusing differences in the use of terminology in the soil science, sociological, and ecological disciplines. A range of concepts and terms to analyse the issues and risks associated with soil degradation has evolved, and these are not always used in the same way or consistently by the scientists in the different disciplines, let alone by different States.

2. What is Soil?

It is well known that the processes involved in soil formation are complex¹² and various definitions of soil reflect this complexity. Two globally accepted definitions include:

The natural dynamic system of unconsolidated mineral and organic material at the earth’s surface. It has been developed by physical, chemical and biological processes including the weathering of rock and the decay of vegetation. Soil materials include organic matter, clay, silt, sand and gravel mixed in such a way as to provide the natural

¹⁰ See Hurni, H., with the assistance of an international group of contributors, 1996, *Precious Earth: From Soil and Water Conservation to Sustainable Land Management* International Soil Conservation Organisation Conference (ISCO) and Centre for Development and Environment, Bern; and El-Swaify, S.A., with an international group of contributors, 1999, *Sustaining the Global Farm – Strategic Issues, Principles, and Approaches*, International Soil Conservation Organisation (ISCO), Department of Agronomy and Soil Science, University of Hawaii at Manoa, Honolulu.

¹¹ Foundation Charles Leopold Mayer, 1995, *Alliance for a Responsible and United World*.

¹² Paton, T.R., 1978, *The Formation of Soil Material*, George Allen and Unwin, Sydney.

medium for the growth of land plants. Soil comprises organised profiles of layers more or less parallel to the earth's surface and formed by the interaction of parent material, climate, organisms and topography over generally long periods of time. It differs markedly from its parent material in morphology, properties and characteristics.¹³

The Council of Europe uses a definition of soil that is similar to the above definition, but it goes a little further:

Soil is an integral part of the earth's ecosystems and is situated at the interface between the earth's surface and bedrock. It is subdivided into successive horizontal layers with specific physical, chemical and biological characteristics. From the standpoint of history of soil use, and from an ecological and environmental point of view, the concept of soil also embraces porous sedimentary rocks and other permeable materials together with the water that these contain, and the reserves of underground water.¹⁴

2.1 Functions of Soil

The definitions clearly indicate that soil has a fundamental role in the terrestrial ecosystem, as a three dimensional body performing a wide range of ecological functions.¹⁵ Alteration of soil processes leads to changes in the function of ecosystems, and many environmental problems that become apparent in other media actually originate within the soil. It is essential that the *principal functions of soil*, which include its ecological functions, cultural functions, and its land use functions, must strongly influence the formulation and design of national and international legal frameworks for soil. The ecological functions, in particular, should be qualitatively and quantitatively safeguarded and preserved in the long term to conserve biodiversity and maintain human life. The functions of soil are summarised in the following paragraphs:¹⁶

2.1.1 Natural Functions of Soil

- Soil is the basis of life and living space for humans, animals, plants and micro-organisms.
- Soil is a fundamental element of nature and landscape.
- Soil is part of the ecological balance, particularly with its water and nutrient cycles.
- Soils are a filtering, buffering and transformation activity, between the atmosphere, the ground water, and the plant cover, protecting the environment and especially humans through the protection of the food chain and the drinking water reserves.
- Soils are used for agriculture and forestry produce biomass.

¹³ Houghton, P.D. and P.E.V. Charman, 1986, *Glossary of Terms Used in Soil Conservation*, Soil Conservation Service of New South Wales and the Standing Committee on Soil Conservation, p. 115.

¹⁴ Council of Europe, 1990, *European Conservation Strategy – Recommendations for the 6th European Ministerial Conference on the Environment*, Strasbourg, Council of Europe.

¹⁵ See, Sheals, J.G., Ed., 1969, *The Soil Ecosystem: Systematic Aspects of the Environment, Organisms & Communities*, The Systematics Association, Publication No. 8, Staples Printers Ltd, London.

¹⁶ Article 1(2) of the *Protocol on the Implementation of the Convention concerning the Protection of the Alps of 1991 in the area of Soil Protection* effectively sets out the multifunctional role of soil.

- Soils are biological habitats and gene reserves, much larger in quantity and in quality than all the above-ground biomass.

2.1.2 Cultural Functions of Soil

- Soils are a geogenic and cultural heritage, forming an essential part of the landscape in which humans live, and concealing paleontological and archaeological information of high value for the understanding of the history of earth and humankind.

2.1.3 Land Use Functions of Soil

- Soils serve as a spatial base for technical, industrial and socio-economic structures and their development.
- Soils are used as a source of raw materials.
- Soils are a location for agriculture, including pastures and forestry.

3. The Nature of Soil

It is vital to recognise that soil is a living medium, which adds significant justification to its protection under a specific area of environmental law. This scientific point is explained in the context that, “organisms, all the living forms or remains of living forms in the soil, includes vegetation as well as soil fauna and microfauna”.¹⁷ It is further stated that the soil is a living organism where “the soil system goes into decline and its component parts begin to fall to pieces if the organic matter is reduced”.¹⁸ If we accept that soil is accommodated within the general definition of a species, where a species “accommodates the grouping and biological classification of living things”,¹⁹ then the maintenance or improvement of the ecological integrity of soil is a vital contribution to the maintenance of biological diversity as a whole.²⁰ In this regard it is useful to consider the concept of “soil biodiversity” as an important component of biodiversity as a whole. Globally, there is a strong general relationship between soil type and the occurrence of plant diversity where the pattern is one of high plant diversity on poor soils and low plant diversity on the best soils. This soil-based plant productivity relationship also provides the foundation for human societies through production of food and renewable forms of energy.²¹ It also recognises

¹⁷ Corbett, J.R., 1969, *The Living Soil: the Processes of Soil Formation*, Martindale Press Pty Ltd, Como.

¹⁸ Hallsworth, E.G., 1987, *Anatomy, Physiology and Psychology of Erosion*, John Wiley and Sons, Brisbane.

¹⁹ “Soil taxonomy” is the classification of soil according to its principal characteristics. A “soil taxonomic unit” is a general term for a grouping of soils based on similarities of the soils within the group, and differences compared with other groups. Macfadyen, A., 1969, “The Systematic Study of Soil Ecosystems”, in Sheals, J.G., Ed., 1969, *The Soil Ecosystem: Systematic Aspects of the Environment, Organisms & Communities*, The Systematics Association, Staples Printers Ltd, London, Publication No. 8, p. 191-197.

²⁰ See e.g., Muranyi, A., 2000, *Assessment of the Capacity Development Needs related to Land Degradation Control in Hungary*, UNDP/GEF Capacity Development Initiatives, Research Institute for Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences, Budapest.

²¹ See Huston, M., 1993, “Biological Diversity, Soils, and Economics”, in *Science* 262:1676-1679.

that the preservation of high plant diversity does not require the sacrifice of productive agricultural land.

Chapter 14 of Agenda 21²² specifies that “our planet’s essential goods and services depend on the variety and variability of genes, species, populations and ecosystems”, and that the natural ecosystems “... contain most of the Earth’s biodiversity”. It further recognises that the current decline in biodiversity is largely the result of human activity and represents a serious threat to human existence. It has been scientifically established that the degradation of soil contributes to the decline of biodiversity, and therefore, it is justified that soil be recognised by the law as an inherent component of biological diversity, defined in Article 2 of the Convention on Biological Diversity²³ as:

The variability among organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

The term *soil resource* is also often used in the soil science discipline. This is usually in the context of the total extent of soil within a given area that is available as a natural medium for plant growth, which is limited and exhaustible, and thus its management must aim to avoid degradation to ensure its potential productive capability is maintained or improved.²⁴ In some instances the term soil resource is also used in the biological sense where it means a natural resource.²⁵

4. Soil Degradation

Soil degradation is defined as a process that lowers the current and/or the potential capability of the soil to produce goods or services. Six specific processes are recognised as the main contributors to soil degradation: water erosion, wind erosion, waterlogging and excess salts, chemical degradation, physical degradation, and biological degradation. Soil degradation now affects one-third of the world’s soils, which are used for agriculture, particularly the soils which are physically and chemically unsuitable for agriculture, grazing, and other purposes. The dominant process is erosion by wind and water, accounting for 83% of the area affected by soil degradation in the world. It has been demonstrated that land use systems are affected in all eco-regions and in most countries, although the impacts differ depending on the type, the severity and extent of soil degradation.²⁶ The most important factors that contribute to a state of soil degradation, and which therefore must be considered within a legal framework for soil, include:²⁷

The Intrinsic Factors of Soil Degradation – these are the influences of climate, terrain, vegetation and biodiversity, especially the soil biodiversity characteristics. However, the actual causes of soil degradation are the agents that determine the rate of degradation. These are:

- The biophysical (land use and land management, including deforestation and tillage methods);
- Socio-economic (land tenure, marketing, institutions, income and human health); and

²² United Nations, 1992, *Agenda 21*, New York.

²³ United Nations Environment Programme, 1995, *Convention on Biological Diversity*, Nairobi.

²⁴ Op. cit. Houghton and Charman, p. 121.

²⁵ Jenny, H., 1980, *The Soil Resource, Origin and Behaviour*, Springer-Verlag, New York.

²⁶ Op. cit. Bridges *et al.*

²⁷ Op. cit. Bridges *et al.*

- Political forces (incentives, political ideology) that influence the processes of soil degradation.

The Biophysical Land Characteristics – the natural resistance of soil to the forces of degradation depends on the inherent characteristics of soil (physical and chemical attributes) and the climatic conditions (mainly the amount and intensity of rainfall).²⁸ Soils can range from highly resistant or stable to extremely sensitive and fragile. Stable soils may be in a steady state condition at a point in time due to the effectiveness of a particular system of land use, whereas fragile soils degrade to a new steady state under stress. The relative area of degraded soil as a percentage of the total area of an individual country varies considerably around the world. One or more causative factors can be responsible for each type of soil degradation process, for example:

- *Agricultural Activities* – the improper management of cultivated arable soils including insufficient or excessive use of fertilisers, shortening of the fallow period in shifting cultivation, use of poor quality irrigation water, absence or inadequate maintenance of erosion control measures, untimely or too frequent use of heavy machinery, water or wind erosion, compaction, loss of nutrients, salinisation, and soil pollution (by pesticides, fertilisers).
- *Removal of Natural Vegetation* – the excessive clearing of natural vegetation is one of the world’s major environmental concerns. Deforestation of primary or secondary forest to convert the forest into agricultural land, large-scale commercial forestry, road construction and urban development cause soil erosion and loss of nutrients. Natural grasslands have been extensively cleared for arable agriculture, paving the way for extensive water and wind erosion.
- *Over-exploitation of Vegetation for Domestic Use* – this activity does not necessarily involve the complete removal of the “natural” vegetation, but rather a degeneration of the remaining vegetation thus offering insufficient protection against soil erosion. It includes activities such as excessive gathering of fuel-wood, fodder and timber.
- *Overgrazing* – overgrazing by livestock leads to loss of vegetation cover, but also causes soil compaction by livestock trampling. In turn, an effect of overgrazing is the increased opportunity for water or wind erosion.
- *Industrial Activities* – includes all human activities of an industrial nature: industries, power generation, infrastructure and urbanisation, waste handling, traffic, etc. It is most often linked to soil pollution of different kinds (either point source or diffuse) and loss of soil productivity.

The most extensive assessment of soil degradation is the “global assessment of human-induced soil degradation” conducted by the International Soil Reference and Information Centre, Wageningen, the Netherlands, in collaboration with UNEP.²⁹ There has also been a subsequent regional assessment of the status of human-induced soil degradation in South and Southeast Asia.³⁰

²⁸ See Greenland, D.J., and I. Szabolcs, Eds., 1994, *Soil Resilience and Sustainable Land Use*, CBA International, Wallingford, Oxfordshire.

²⁹ Oldeman, L.R., R.T. Hakkeling and W.G. Sombroek, 1991, *World Map of the Status of Human-Induced Soil Degradation*, ISRIC/UNEP, Wageningen, the Netherlands.

³⁰ Lyndan, G.W.J. van and L.R. Oldeman, 1997, *The Assessment of the Status of Human-Induced Soil Degradation in South and South East Asia*, ISRIC/UNEP/FAO, Wageningen, the Netherlands.

5. Land Degradation

This report focuses on the need for legal protection of soil. However, in order for the legal needs to be understood, the relationship between *soil degradation* and the degradation of other elements of the natural environment must be canvassed. It is therefore necessary here to introduce the concept of *land degradation*. Land is here defined as:

The terrestrial bio-productive system that comprises soil, vegetation, other biota, and the ecological and hydrological processes that operate within the system.³¹

The term “land degradation”, a term commonly used as an alternative to “soil degradation”, actually goes wider than that and includes the degradation of water and vegetation. The term is here defined as the overall reduction in the capability of the land to produce benefits from a particular land use under a specific form of land management. It means:

The decline in quality of natural land resources, commonly caused through improper use of the land by humans. It encompasses soil degradation and the deterioration of natural landscapes and vegetation and includes the adverse effects of overgrazing, excessive tillage, overclearing, erosion, sediment deposition, extractive industries, urbanisation, disposal of industrial wastes, road construction, decline of plant communities and the effects of noxious plants and animals.³²

A limiting aspect of the definition of land degradation is that it does not give sufficient recognition to the soil in an ecological context, which gives further justification to the need for a specific area of law to protect and manage the soil; however, this must be seen as a component of the wider body of law which covers all aspects of “land” degradation (e.g., water law, vegetation management law). This wider, more complex relationship between the degradation of soil and the degradation of all aspects of land, is effectively summarised in the following box on the “DPSIR” framework for evaluating land degradation – the “Driving Force, Pressure, State, Impact, Response” model.³³

While it is acknowledged that many soil degradation processes are directly linked to the degradation of vegetation or water, and alterations to other ecological and hydrological processes in the “land” system, this report deals specifically with the ecological element, the “soil”, and is therefore concerned with the protection and management of soil from soil degradation processes. It is also relevant to note that both the Amman Resolution and Objective 12, “Soil”, of the Montevideo Programme III refer to “soil”, not land.

6. Soil Conservation

There are many, similar, definitions of “soil conservation”, which tend to be technocentric. A typical definition is:

The prevention, mitigation or control of soil erosion and degradation through the application to land of cultural, vegetative, structural and land management measures,

³¹ Definition of “land” in Article 1(e) of the *Convention to Combat Desertification*.

³² Op. cit. Houghton and Charman, p. 73.

³³ As adapted from op. cit. Bridges *et al.*

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The DPSIR (“Driving Force, Pressure, State, Impact, Response”) Framework is an approach to land degradation, developed by the European Environment Agency, which serves to describe, monitor and control environmental problems.³⁴ The approach is based on the use of indicators, which may be direct or indirect, ecological, technical, socio-economic or cultural characters.

The first key question is: what is the driving force behind the problem? The problem itself is then sub-divided into three stages: the pressure, deriving from the driving force, the state that the pressure creates and the impact that results from the state. The second key question is how to respond to this sequence so as to change the driving forces, in order to alleviate or to reverse the problem.

Scientists, technicians, farmers and others can use the framework of driving force, pressure, state, impact and response at the grassroots level, in order to identify a problem. At the same time the approach may be used by politicians and decision-makers in order to respond to a situation, thus bringing together all persons concerned. For example, a driving force can be the lowering of prices for agricultural commodities on local markets, thus decreasing the income of farmers.

The pressure of reduced income and inability to replace nutrients by fertilisers results in nutrient mining. This leads to soil degradation by nutrient depletion. On sloping lands, if no anti-erosion measures are taken through a lack of funds, soil erosion will occur. The direct impact is a change in soil function, a decrease in soil fertility and a decrease in biomass production. An indirect impact can be changes in population size and distribution in rural areas, as a result of low income. The response should be directed at the driving force, i.e. towards improving market conditions and maintaining reasonable market prices for agricultural commodities, rather than remedying the state of the soil or alleviating the pressure itself by supplying fertilisers to farmers. In this example, the response would be an economic and social response and not a technical one.

Indicators should have the following characteristics:

- Policy relevance: data should be led more by demand (issue) than supply-driven and include important political features;
- Analytical soundness: indicators must be scientifically based and clearly show a cause-response relationship;
- Easy interpretation: indicators should be easily understandable for stakeholders, especially farmers, as well as for decision-makers and politicians; and
- Measurability: indicators should be feasible and cost effective in so far as data collection, processing and dissemination are concerned.

These indicators can be used at all stages within the DPSIR framework and if applied in the correct way therefore are an effective tool with which to respond to land degradation.

either singly or in combination, which enable stability and productivity to be maintained for future generations.³⁵

The global literature explains soil conservation in the context of practical approaches to field assessment and control of soil erosion.³⁶ Some sources describe it as the physical application of

³⁴ European Environment Agency, 1999, *Environment in the European Union at the Turn of the Century*, Environmental Assessment Report No. 2, EEA, Copenhagen.

³⁵ Op. cit. Houghton and Charman, p. 116.

³⁶ See Morgan, R.P.C., Ed., 1981, *Soil Conservation, Problems and Prospects*, John Wiley and Sons, New York; and the Council of Europe, 1988, *Problems of Soil Conservation*, Nature and Environment Series, Strasbourg.

land and water management knowledge by skilful or artful means, with the goal of protecting soil resources from exploitation, destruction, or neglect. Morgan discusses soil conservation in a strategic sense and argues that strategies for soil conservation require a thorough understanding of the processes of erosion. He asserts that the aim of soil conservation is to obtain the maximum sustained level of production from a given area of land whilst maintaining soil loss below a threshold level which, he says, theoretically permits the natural rate of soil formation to keep pace with the rate of soil erosion.³⁷ These days, the breadth of the discipline of soil conservation is observed through the wide range of subjects that are discussed at the International Soil Conservation Organisation conferences.³⁸

7. Soil and the Environment

7.1 Environment

The term *environment* now appears worldwide in all aspects of environmental literature, and it is sometimes used in reference to the “soil environment”.³⁹ Environment is variously defined. An ecologically oriented definition is:

The surroundings of an organism – all the physical and biological factors with which an individual interacts and on which it depends for its survival.⁴⁰

If soil can be defined as living ecological communities throughout the earth’s ecosystem, then its ecological condition is governed by the condition of its surrounding environment (under the above definition), and depending on how soil is managed in its total environment, it can modify and change the physical and biological factors in these surroundings. Further, by comparison, a dictionary definition of environment means:

The aggregate of surrounding things, conditions or influences; the biological conditions in which an organism lives, especially a balanced system.⁴¹

The important point is that the biological definition of environment is seen in an “ecosystem” context, which introduces additional and important concepts for the soil, including the concepts of sustainability and intrinsic value. In this context, the term “soil environment” can be referred to as the natural dynamic system of unconsolidated mineral and organic material at the earth’s surface which interacts with, and influences, all aspects of the living community of earth and the natural, human-made and social surroundings of that community. Soil, when viewed in this way, requires special attention in the law making process, including the use of specific legal elements for its protection and management, which are ecosystem-based. In particular, the law needs to recognise that all soils have ecological limits in that their resilience to their degradation and loss of soil biodiversity depends on the inherent physical and chemical characteristics of the specific soil type and the climatic and topographical situation in which they occur.

³⁷ Op. cit. Morgan, p. 162.

³⁸ See op. cit. Hurni *et al*; El-Swaify *et al*.

³⁹ See Russell, E.W., 1969, “The Soil Environment”, in Sheals, J.G., Ed., 1969, *The Soil Ecosystem: Systematic Aspects of the Environment, Organisms & Communities*, The Systematics Association, Publication No. 8, Staples Printers Ltd, London, p.1-7.

⁴⁰ Recher, H., D. Lunney, and I. Dunn, 1986, *A Natural Legacy, Ecology in Australia*, Pergamon Press, Sydney.

⁴¹ See e.g., *Oxford Advanced Dictionary*, 1992, Seventh Impression, Oxford University Press.

8. An Ecosystem-Based Approach

The Convention on Biological Diversity (CBD) defines an ecosystem as a “dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit”.⁴² An ecosystem-based approach is an appropriate strategy for the integrated management of land, water and all living resources. It also promotes conservation and sustainable use in an equitable way, based on the application of appropriate scientific methodologies. At the fifth meeting of the Conference of Parties of the CBD, governments and relevant bodies were urged to apply the ecosystem approach in their environmental law reform. The Conference of the Parties adopted 12 broad principles for the application of the ecosystem approach with a clear rationale underlying each principle.

As the well-being of human society, perhaps its survival, may depend on a conscious effort to slow down the rate of development and modification of biological diversity an ecological approach is required toward law and policy making in general, and land use decision-making in particular.⁴³ With regard to the soil, this means developing legal mechanisms, which enable an ecosystem-based approach to be applied in all aspects of soil protection and management. Such a process is likely to have a different outcome from a process that relies merely on the application of the conventional, scientific and objective principles of ecology to protect and manage soil. This is because the ecosystem approach studies the *relationship* between soil, as living ecological communities, and the environment.⁴⁴ An effective legal system for the protection of soil will therefore depend on the selection of appropriate ecological concepts and the development of a legal structure with the appropriate elements to implement these concepts.⁴⁵

The deterioration of ecosystems, both quantitatively and qualitatively, has enhanced a goal of “ecosystem health”, a concept relevant to the soil. Economic activity, social organisation, and human health maintenance are all tied closely to the viability and health of ecosystems, a relationship that underscores the critical importance to society of fostering ecosystem health.⁴⁶ Humans know, from personal experience what it means to be physically dysfunctional and are educated about the process of general screening, diagnosis, monitoring of signs, and other phases of health care. A similar process is applicable in evaluating ecosystem health that is defined in an operational manner, and assessments of health status can, at least in part, be based on objective criteria. Systematic diagnosis of ecosystem conditions and the careful study of ecosystems under stress can yield early warning indicators of ecosystem degradation. Ecosystem health practice requires not only diagnostic and curative capabilities, but also, very importantly, monitoring and preventive measures.

⁴² Article 2, *Convention on Biological Diversity*.

⁴³ See Glowka, L. in collaboration with C. Shine, O. Rey Santos, M. Farooque and L. Gündling, 1998, *A Guide to Undertaking Biodiversity Legal and Institutional Profiles*, Environmental Policy and Law Paper No 35, IUCN Environmental Law Centre; see Article 1 of the *Protocol on the Implementation of the Convention concerning the protection of the Alps of 1991 in the area of Soil Protection*.

⁴⁴ See *op. cit.*, Macfadyen.

⁴⁵ The concept of “agrobiodiversity” is now recognised in the biodiversity literature, where it is defined as “the principal biological means of degradation control and, by mixing of species, the main promoter of increased and more diversified (and more food secure) output from farming systems”. See Tenberg, A., and M. Stocking, 2001, “Land Degradation, Food Security and Agrobiodiversity – Examining an old problem in a new way”, in Bridges, E.M., I.D. Hannam, L.R. Oldeman, F. Penning deVries, S.J. Scherr, and S. Sombatpanit, 2001, Eds., *Response to Land Degradation*, Science Publishers Inc, Enfield (N.H.), USA.

⁴⁶ See Rapport, D.R., P. Constanza, C. Epstein, C. Gaudet, and R. Levins, 1998, Eds., *Ecosystem Health*, Blackwell Science Inc, Malden, USA.

9. Sustainability

9.1 Concepts of Sustainability

The use of the word sustainability can be viewed in various contexts, including sustainable biological resource use, sustainable agriculture, carrying capacity, sustainable energy, sustainable society, sustainable economy, and sustainable development. The common issues to emerge from this analysis that are important to consider in the formation of soil law include:

- The continued support of human life on earth;
- The long-term maintenance of the stock of biological resources and the productivity of agricultural systems;
- Stable human populations;
- Limited growth economies;
- An emphasis on small-scale and self-reliance; and
- Continued quality of the environment and component ecosystems.⁴⁷

Further, sustainability can be considered within two time frames and this may very well be the most important factor to come to grips with in the development of national and international soil legislation.⁴⁸ The first time frame is a short-term human-centred view that equates sustainability with food sufficiency. It focuses on sources of demand for foodstuffs (i.e., maximising long-term production) and sets production targets to be met by some combination of more resources and greater productive efficiency. The second timeframe encapsulates “ecological sustainability” which is the primary objective of the “sustainability-as-stewardship value” and advocates that achieving a sustainable society will not be possible without a reordering of priorities. This latter, more ecologically-centred view, must be supported by improved soil legislation that has some influence over the allocation of land for agricultural production, the intensity of soil use, and the application of comprehensive soil conservation techniques to manage the human demands on the soil. This is regarded as the most appropriate mode of sustainability to reduce soil degradation and it is closely linked to the goal of continued functioning and reinstatement of healthy ecosystems as espoused by the CBD.⁴⁹

9.2 The World Commission on Environment and Development – The Brundtland Report

The report of the World Commission on Environment and Development (WCED), *Our Common Future*,⁵⁰ has made a significant contribution to the formulation of sustainability policy in the

⁴⁷ See p. 713-719, Brown, J., M. Hanson, D. Liverman, and R. Merideth, 1987, “Global Sustainability: Toward Definition”, in *Environmental Management* 11 (6): 713.

⁴⁸ See p. 271-275, Douglass, G.K., Ed., 1984, *Agricultural Sustainability in a Changing World Order*, Westview, Boulder, Colorado.

⁴⁹ See in particular, Articles 8-10; see also op. cit. Huston, p. 1677.

⁵⁰ The World Commission on Environment and Development, 1987, *Our Common Future*, Oxford University Press.

western world.⁵¹ The WCED report promoted sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. In relation to soil conservation, *Our Common Future* indicates that significant changes to the existing soil legislation would have to be made to accommodate the objectives of sustainable development, and that the approach to future legislative frameworks should be substantially different from the past.⁵² However, the perception of the concept of sustainable development has generated some differences in opinion that need to be noted.⁵³ For example, Kneen argued that the term contains too much emphasis in development, and he specifies that it is imperative for humans to understand the assumptions and consequences of development and choose sustainability and equity as the goals of a radical restructuring of the global economy.

9.3 Sustainable Land Management

The concept of “sustainable land management”, which is based on the “sustainable development” concept, has been promoted as an appropriate framework to protect and manage soil. Many bilateral and multilateral environmental conventions introduced in the past two decades discuss this concept and they encourage States to prepare national conservation strategies to address environmental degradation and resource depletion. Documents which refer to the concept of sustainable land management and which have been important for soil, include: *The World Charter for Nature*,⁵⁴ *The World Commission on Environment and Development*,⁵⁵ *Caring for the Earth*,⁵⁶ *The Rio Declaration on Environment and Development*⁵⁷ and *Agenda 21*.⁵⁸ However, it is clear from these documents that a variety of land management programs, policies, educational initiatives and national laws are necessary to successfully implement a goal of sustainable land management. This raises some important considerations for soil legislation. Sustainable land management has been interpreted in many ways in various global environmental management strategies, and some regions have developed guidelines to control soil degradation under this framework. For example, the International Board for Soil Research and Management (IBSRAM) summarised sustainable land management as “*land management systems that combine technologies, policies and activities aimed at integrating socio-economic principles with environmental concerns to satisfy the five pillars of sustainable land management*”. The five pillars are:

- To maintain or enhance production;
- To reduce the level of production risk;

⁵¹ See p. 11, MacNeill, J. 1989, “Strategies for Environment and Development, Our Common Future”, in *Future*, Commission for the Future, 12:11.

⁵² Hannam, I.D., 1992, “The Concept of Sustainable Land Management and Soil Conservation Law and Policy in Australia”, in P. Henriques, Ed., *Proceedings of International Conference on Sustainable Land Management*, International Pacific College, Palmerston North, New Zealand, p. 153-168.

⁵³ See Williams, M. 1993, “Sustainability: An Overworked Word?”, in *Agricultural Science*, 26-48: and Kneen, B., 1989, “The Contradiction of Sustainable Development”, *Canadian Dimension*, Jan/Feb.

⁵⁴ United Nations Environment Programme, 1982, *World Charter for Nature*.

⁵⁵ Op. cit. The World Commission on Environment and Development.

⁵⁶ International Union for the Conservation of Nature and Natural Resources, United Nations Environment Programme and World Wildlife Fund, 1991, *Caring For the Earth*, A Strategy for Sustainable Living Gland, Switzerland.

⁵⁷ United Nations, 1992, *The Rio Declaration*.

⁵⁸ See op. cit. *Agenda 21*.

- To protect the potential of natural resources and prevent degradation of soil and water quality;
- To be economically viable; and
- To achieve social acceptability.⁵⁹

A legal framework for sustainable land management is clearly a broader, integrated and complex long-term endeavour, requiring the input and cooperation of many disciplines and the experience of many experts.⁶⁰ Under the circumstances, this report advocates that the current general understanding and application of the concept of sustainable land management utilises an approach that is too narrow for soil legislation because of its orientation toward production. What is required is a concept of sustainable land management, which takes an ecologically-oriented approach.

10. The Sustainable Use of Soil

10.1 The Sustainability Dilemma

The concept of sustainability is increasingly used as a desired goal for soil conservation worldwide.⁶¹ However, there has been a general failure of soil conservation literature to adequately explain the precise context and limitations of “sustainability”, and the appropriate type of soil legislation needed for its successful implementation. This is perhaps explained by the lack of clarity in the use of the concept of sustainability, and the different and sometimes contradictory definitions of sustainability and related terms. This lack of specificity in relation to the type of sustainability sought, and the actual means for achieving it, needs to be carefully considered so the term can be successfully applied to soil.⁶² This dilemma appears to have arisen through a number of factors, including:⁶³

- Inadequate attempts to understand and define the concept within a soil management objective, or to arrange legislation and policy to ensure that practical sustainable land use principles can be implemented. This may have arisen because it is a very complex subject that has been treated only in a simple manner in the policy area in the past.
- The relatively short period of time that some land use activities have been in practice precludes reliable prediction of their ability to be sustainable in the long term.

⁵⁹ The International Board for Soil Research and Management (IBSRAM), 1997, *Towards Sustainable Land Management in the 21st Century*, The IBSRAM Vision, Bangkok. Note – In early 2001 IBSRAM integrated with the International Water Management Institute (IWMI) in Bangkok, Thailand.

⁶⁰ See op. cit. Hurni *et al.*

⁶¹ See op. cit. Hurni *et al.*; El-Swaify *et al.*

⁶² See Liverman, D.M., M.E. Hanson, B.J. Brown, and R.W. Merideth 1988, “Global Sustainability: Toward Measurement”, in *Journal of Environmental Management* 12:2; Williams and Chasek, P., 1997, “The Convention to Combat Desertification: Lessons Learned for Sustainable Development”, in *The Journal of Environment and Development, A Review of International Policy* 6:147.

⁶³ See p. 36, Plucknett, D.L., 1990, “International Goals and the Role of the International Agricultural Research Centres” in C.A. Edwards *et al.*, Eds., *Sustainable Agricultural Systems*, Soil and Water Conservation Society, Iowa.

- The variation of the requirements for sustainability between different land use activities and the time period required to achieve the sustainable use of the soil. This is influenced by the complex interactions of biological, physical and socio-economic factors and requires a comprehensive approach to research in order to improve existing systems and develop new, more sustainable land uses.

The meaning of sustainability is in any case strongly dependent on the context in which it is applied and whether its use is based on a social, economic, or ecological perspective. Brown et al explain that the etymology of the terms *sustainable*, and *to sustain*, originates in the French verb *soutenir*, which means to hold up or support.⁶⁴ The general dictionary definition means “to hold or bear up from below; be the support of; to keep up or keep going, as an action or process”. The difficulty is that economic, environmental and social problems are linked together, and at some point the lack of sustainable land management systems will result in economic decline and ultimately to social problems.⁶⁵ The recognition of severe soil degradation has already caused some nations to investigate its effect on soil productivity, in order to establish the sustainable limits of soil under different land management approaches. The term “land management” involves the “application to land of cultural, structural, vegetative or other types of measures, either singly or in combination, in order to achieve a desired land use”.⁶⁶ In a soil conservation context, land management includes provision for both the control and prevention of soil degradation processes.

The use of land management practices, which will enable the sustainable use of soil, should therefore be provided for in a legal and institutional system, which has the capability to:⁶⁷

- Identify critical ecological issues of soil degradation by the inclusion of prescribed standards of land use which are based on the ecological limits of soil;
- Allow these issues to be considered within an effective planning and decision-making system;
- Achieve compliance with acceptable *ecological soil standards*; and
- Monitor the effects of sustainable land use practices over time.

At this stage, there has been little observance in clarifying and explaining what the environmental and economic trade-offs to soil would be among the different definitions of sustainability, and between the different land use systems. However, it seems reasonable to suggest that the key points to be addressed in the framing of soil legislation that incorporates sustainable use objectives are:

- *What* aspects of the soil environment have to be sustained (e.g., the level of soil nutrients, the biological diversity of the ecosystem)?
- Over *how long* is the land use activity to be sustainable (a few years, several decades, perpetuity)?

⁶⁴ Op. cit. Brown *et al*, p. 713.

⁶⁵ Blaikie, P. and H. Brookfield, 1987, “Defining and Debating the Problem”, in Blaikie, P. and H. Brookfield, Eds., *Land Degradation and Society*, Methuen, London.

⁶⁶ Op. cit. Houghton and Charman, p. 74.

⁶⁷ See Hannam, I.D., 1998. “An Ecological Perspective of Soil Conservation Policy and Law in Australia”, in Blume, H.P., H. Eger, E. Fleischhaueur, A. Hebel, C. Reij, and K. Steiner, Eds., *Towards Sustainable Land Use - Furthering Cooperation Between People and Institutions*, Advances in Geoecology 31:945-952, Catena Verlag, Reskirchen.

- Over *what area* is the sustainable use of soils sought (a community, a region, and across State borders)?

Taking into account the above, the term “sustainable use of soil” in the context of this report means – the use of soils in a manner that preserves the balance between the processes of soil formation and soil degradation, while maintaining the ecological functions and needs of soil. In this context, “the use of soil” means ‘the role of soil in the conservation of biodiversity and the maintenance of human life’.

11. Ecological Integrity of Soil and the Need for Ecological Soil Standards

Because the land use demands on soil are determined by social and cultural factors, the values and standards of soil consumption should be rigidly defined by the ecological limits of different forms of land use. These specific *ecological soil standards* should be developed to evaluate the potential for any sustainability-oriented concept, or practice that may seem appropriate to meet the goal of sustainable use of soil. The standards can also be used as a basis to formulate elements for soil legislation, with the same goal. Because soil is non-renewable (except in the very long term) and its continued intensive use is currently reducing the stock for future generations, this does not mean that soil cannot be used for agricultural and non-agricultural practices.⁶⁸ It means that all forms of soil use should be subject to rigid application of ecological soil standards to ensure sustainability, and in this regard they may be established as “norms”.⁶⁹ Various eco-ethical concepts can form the basis of standards that should be applied in the legal and institutional arenas to maintain or improve the physical and chemical status of soil i.e., the *ecological integrity of the soil*. It is therefore proposed that the concept of an *ecological soil standard*, which derives from the above interrelationships, be accepted as:

Any process that maintains or improves the ecological integrity of soil, where the term “ecological integrity of soil” means:

Preserving the ecosystems, including the prevention of loss of wholeness, which is the commencement of soil degradation, to control existing soil degradation, and to protect and manage soil for its sustainable use.⁷⁰

In the above context, a *standard* includes anything taken by general consent as a basis of comparison, where the basis for “comparison” is the ecological benefit that would accrue to soil by the adoption of one or more *ecological standards*, compared with the loss of ecological integrity of the soil (i.e., degradation) if appropriate *ecological soil standards* are not used. Therefore, it is suggested that the definition of an *ecological soil standard* can be applied to:

- Processes of soil policy formulation and preparation of plans or strategies;
- Techniques applied in land use planning;

⁶⁸ See p. 479, op. cit. Bridges *et al.*

⁶⁹ See e.g., Bodansky, D. 1995, “Customary (and not so Customary) International Environmental Law”, in *Indiana Journal of Global Legal Studies*, 3,1:105, who discusses the use of non-legal norms in international environmental law; see also chapter 5 “Environmental quality norms” in the Environmental Code of Sweden.

⁷⁰ See p.153 op. cit. Hannam, 1992.

- A land use decision-making process; and
- Practical soil conservation measures.

In all instances, it is imperative that the application of an *ecological soil standard* be based on suitable criteria (e.g., soil loss tolerance limits) and values (e.g., criteria to achieve ecologically sustainable land use) that will provide ultimate benefit to the soil environment.

12. Role of Soil Institutions

For decades, the principal international soil organisations, including the International Board for Soil Research and Management (IBSRAM), the International Soil Reference and Information Centre (ISRIC) and the Food and Agriculture Organization of the United Nations (FAO), have developed substantial soil management guidelines and information materials. These materials deal with practical soil management issues, land evaluation, and soil mapping and monitoring the condition of soil. Some legally-based materials have been prepared by FAO.⁷¹ There is an abundance of technical standards within these materials, as well as in the wide body of published material in the international soil science journals, that can be drawn upon to derive the elements for national and international legal frameworks for soil.⁷² A number of regional soil institutions, such as the European Soil Bureau of the European Commission, which has a significant role in the Eastern and Western European countries, have produced materials, which will be of assistance in developing national and international legal frameworks for soil.⁷³ A number of national soil organisations have also produced materials that can serve the same purpose.⁷⁴

13. Soil Science Organisations

Since the United Nations Conference on Environment and Development in 1992 there has been a growing interest by the peak international soil science bodies to pursue better national and international legal frameworks for soil. For example, at the 1998 Congress of the International Union of Soil Sciences, a working group was formed to look at the possibilities for a global soil convention.⁷⁵ The turning point came at the conclusion of the 2nd International Conference on Land Degradation in Thailand (January 1999) when a resolution was passed to actively seek the introduction of an international soil conservation instrument. This decision provided the impetus to the Commission on Environmental Law decision of March 1999 to commence an examination of the legal aspects of soil conservation. Since January 1999, the topic of an international instrument for soil has been a prominent agenda item on major soil science conferences and gatherings, including the:

- 10th International Soil Conservation Organisation Conference, May 1999, USA.

⁷¹ Christy, L.C., 1972, *Legislative Principles of Soil Conservation*, Food and Agriculture Organization of the United Nations.

⁷² See e.g., the Polish Academy of Sciences, Committee of Soil Science and Agricultural Chemistry; British Society of Soil Science, Soil Science Society of America.

⁷³ E.g., the meeting in Uppsala, Sweden, 23-24 April 2001 on *The Support of Soil Science Research to the European Sustainable Development*, concluded, amongst other things, that the European Union has an important role to play by introducing sustainable use of soils in its own legislation and in international binding agreements.

⁷⁴ See e.g., Institutional Innovations discussed in op. cit. Bridges *et al.*

⁷⁵ This was based on the Tutzing proposal, discussed in section 5 of this report.

- Council meeting of the International Union of Soil Sciences, April 2000, Thailand.
- Soils Conference for New Independent States, Central Asia and Mongolia, August 2000, Czech Republic.
- 11th International Soil Conservation Organisation Conference, October 2000, Argentina.
- 3rd International Conference on Land Degradation, October 2001, Brazil.

The topic of an international environmental law instrument for soil is already designated as a special item at the:

- 12th International Soil Conservation Organisation Conference, May 2002, China.
- 17th World Congress of Soil Sciences, August 2002, Thailand.

Section 3

III. National Soil Regimes

Legislation has been used for many years in many countries in a piece-meal fashion to manage specific types of soil problems (e.g., soil erosion), to control land use activities, which directly cause soil degradation problems (e.g., over-grazing of cattle and sheep), and to indirectly control soil management problems (e.g., through environmental planning and land use allocation).⁷⁶

The 1980's and 1990's witnessed a growth in a broad range of environmental law at the international and national levels to manage the natural environment. However, soil law reform has not been prominent in this context. The legal and institutional frameworks in most countries still approach soil conservation in a fragmented way. In the past, the main type of legislation aimed at the control of soil degradation has been the "soil conservation law".⁷⁷ The legislation had a land utilisation focus, which is no longer adequate to effectively protect and manage the world's soil degradation problems. In the past, as the area of land affected by soil degradation grew, practical soil conservation techniques were developed and applied in conjunction with expanding agricultural activities.⁷⁸ The conservation capabilities of the legislation were overshadowed by the objective of agricultural production, price support schemes for domestic and export needs, and land settlement and development schemes. Soil conservation legislation was introduced in the first half of the 19th century primarily to control the effects of soil erosion by wind and water. This type of legislation was prominent in colonial Africa, Australia, New Zealand, the United States and some European and Asian nations.⁷⁹ Soil conservation legislation was generally introduced to prevent, mitigate or manage soil erosion on arable or pastoral land, mainly at the farm level. Some of the legislation had provisions for land management planning at a catchment or watershed scale.⁸⁰ In the early 1970's it was stated that:

The general object of soil conservation legislation is to induce those whose activities affect the soil to act in a manner that preserves its desired qualities to a greater extent than their normal manner of operation would do.⁸¹

By mid-1990, and in pursuance of a sustainable land management goal, it was acknowledged that a range of land management programs, policies, and educational initiatives, as well as national and local laws, were necessary to successfully change the behaviour of land users to achieve such a goal.⁸²

⁷⁶ See Kurucz, M., 1993, "Land Protection, Property Rights and Environmental Preferences (Land Use Control and Land Development)", in *Connecticut Journal of International Law*, 8(2):467.

⁷⁷ See Grossman, M. and Brussaard, W., 1992, Eds., *Agrarian Land Law in the Western World*, CAB International, Wallingford.

⁷⁸ See Hudson, N., 1995, *Soil Conservation*, Iowa State University Press/Ames.

⁷⁹ See e.g., *Hazara Forest Act 1936*, Pakistan; *Soil Conservation Act 1938*, New South Wales, Australia; *Natural Resources Act 1951*, Swaziland; *Soil Conservation Act 1951*, Sri Lanka; *Soil Conservation Law 1952*, Cyprus.

⁸⁰ See e.g., Bradsen, J.R., 1988, *Soil Conservation Legislation in Australia*, Report for the National Soil Conservation Program, University of Adelaide, Adelaide; Tran, Huong, Liu-Hsiang Chuang, and Guss, C., 1997, *Natural Resources Conservation Laws, A Study of Seventeen States and their Selected Counties and Townships*, Natural Resources Conservation Service, United States Department of Agriculture, Washington; and Krasnova, I., 2000, "Legal Protection of Soils, Russian Federation", in *Environmental Policy and Law*, 3076.

⁸¹ See op. cit. Christy.

⁸² See op. cit. Hurni *et al*; El-Swaify *et al*; UNEP and FAO, 1999, *The Future of Our Land: Facing the Challenge*, Rome.

1. Soil in Other Resource-Oriented Legal Regimes

In addition to the specific soil legislation, there are many areas of environmental law which can assist with the sustainable management of soil. These include the following:⁸³

Land Administration Law

There are many laws that provide for the administration and management of land. These have been employed to control land use in ways that have contributed to soil mismanagement. This legislative regime includes various forms of land tenancy and leasehold regimes, with provisions to assess land, regulate conditions of occupancy, use, sale, lease and reservation. There may also be provisions for forfeiture of holdings, alteration of conditions of use, and protection of land dedicated for public use.

Pastoral Land Management Law

Pastoral land law in some countries was an early form of legislation used to manage rural land. Although its primary concern is land administration, as against environmental management and land conservation, this type of law often contains mechanisms that can achieve sustainable use of soil. These include enforceable conditions in land leases in relation to grazing management, vegetation and soil management, and the monitoring of rangeland condition.

Biodiversity Law

There is a body of law that has a general objective to protect the environment and conserve biological diversity, that is, the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. This law assists the objective of soil conservation through its promotion of ecologically sustainable development and through the conservation of natural resources in general. Biodiversity legislation generally does not apply directly to the control of agricultural land uses, but it is applied to achieve more effective conservation and management of protected and reserved areas in agricultural landscapes.⁸⁴

Native Vegetation Conservation Law

This area of law is very important for the conservation of soil because it focuses on the conservation and sustainable management of native vegetation and the control of land clearing. It promotes native vegetation management in consideration of social, economic and environmental parameters. It sets rules for the ecological assessment of vegetation (its biodiversity, habitat values, flora and fauna values, regional patterns, and threatened species), and rules for issue of permits.

Forest Law

Forest laws have been created for both public and private forestry with provisions to develop and apply land management guidelines for the operational management plans for soil erosion control.⁸⁵ In more recent years, plantation establishment and reforestation law has been

⁸³ See op. cit. Grossman and Brussaard.

⁸⁴ De Klemm, C. in collaboration with C. Shine, 1993, *Biological Diversity Conservation and the Law: Legal Mechanisms for Conserving Species and Ecosystems*, IUCN Environmental Law Centre and IUCN Biodiversity Programme.

⁸⁵ See Tarasofsky, R. G. 1999, Ed., *Assessing the International Forest Regime*, IUCN Environmental Policy and Law Paper No. 37.

introduced to promote the reforestation of land and establishment of forest plantation in areas badly affected by soil degradation, including areas affected by water and wind erosion and salinity.

Environmental Protection Law

The main purpose of this area of legislation is to protect, restore and enhance the quality of the environment by reducing the risks to human health and preventing the degradation of the environment by pollution, waste management, discharge of harmful substances, and point-source pollution, particularly air and water pollution. National environmental protection measures can cover any activity that may impact, or has impacted on the environment, any form of pollution, any aspect of waste, any kind of technology or process, or any kind of chemical or other substance that may impact or has impacted on the environment.

Environmental Planning and Assessment Law

The objective of environmental planning legislation is to protect the human and natural environment through the preparation of land use or zoning plans and the prescription of environmental assessment standards for land use and for determining significant environmental impact from land use change. This type of legislation can address matters of national environmental importance, including for example, preservation of natural character, protection of outstanding natural features, efficient use and development of natural and physical resources, maintenance and enhancement of amenity values, and heritage protection. In some jurisdictions, planning and assessment legislation is integrated, but in many others, they are separate regimes.

2. Legal Frameworks

Given the volume of soil science knowledge, the inherent risks or uncertainty that characterise many actions involving the use of soil and the economic and social importance attached to soil and land, law-makers face a number of challenges in developing effective legislation. The current degraded state of the world's soil resources alone clearly justifies a reassessment as to how, and what type of national and international legislative frameworks are best to rectify the current physical and legal problems relating to soil. Well-designed legal frameworks are essential to guide this process, in order to prevent or minimise the risk of soil degradation and to provide a basis for the sustainable use of soil. Legislation may be designed not only to prohibit or restrict land use activities but also to promote desired goals through the provision of economic or other incentives. Legislation also plays an important role in establishing the institutional mechanisms at a national and international level needed to develop practical soil conservation measures, promote effective compliance, and monitor the successes and failures of soil conservation programs.

The experience of implementing national soil legislation, particularly in countries seriously affected by soil degradation, can help point towards the elements necessary for a national and international framework. The causes and effects of soil degradation are similar worldwide and the extent and severity of degraded soil clearly establishes soil degradation as a global problem of high magnitude. Moreover, the physical and social impacts of soil degradation do not stop at political boundaries.⁸⁶ Isolated unilateral action by individual States will generally not be enough to address all activities and processes that generate soil degradation. Whatever the soil degradation problem, and at whatever level, the effective management of soil must be based on common objectives and

⁸⁶ E.g., following the wars in the Gulf region and the Baltic region, the environmental impacts of warfare on soil have become very apparent, see Shahid, S., and S. Omar, 2001, "Causes and Impacts of Land Degradation in the Arid Environment of Kuwait", in *Response to Land Degradation*, Bridges, E.M., I.D. Hannam, L.R. Oldeman, F. Penning de Vries, S.J. Scherr, and S. Sombatpanit, 2001, Eds., Science Publishers Inc, Enfield (N.H), USA.

agreed approaches, supported, in appropriate situations, by concerted bilateral, regional or global action.

3. Globalisation and Legal Protection for Soil

The term “global farm” is now used widely in regard to the use and management of land and soil for agriculture, and the concept of globalisation is embedded within the meaning of the “global farm”. The “global farm” has been defined as the world’s terrestrial natural resources that support plant and animal production and provides the food, feed, fuel, and fibre that sustain human life. It also involves those who operate the “farm”, including farmers, farming communities, social and political institutions and other organisations that support and influence these people.⁸⁷

In line with the concept of the global farm, a number of developing States are now using their land at a higher level of intensity of production than in the past to satisfy domestic food demands and to produce export products to generate national income for economic survival. Developed States are also using land at higher intensity to capitalise on greater access to international markets. This cycle establishes a critical link between international trade and soil degradation, and the general protection of the environment *per se*.⁸⁸ In recognition of the need for cooperation between the Commission on Sustainable Development, the World Trade Organisation (WTO), UNEP and the United Nations Conference on Trade and Development (UNCTAD) the Marrakech Trade Agreement was signed in April 1994.⁸⁹ This decision provided for work to begin in the WTO Committee on Trade and the Environment on trade and the protection of the environment. This Committee, in its role of considering the relationship between provisions of the multilateral trading system and those trade measures taken pursuant to the multilateral environmental agreements and protocols, is in a good position to help address the impact of many imbalances in global land use and the future management of soil degradation. It is also in a very good position to take a leadership role and promote a greater awareness among nations of the need for better soil protection. It may even be possible for the WTO Committee to establish some rules on “sustainable use of soils and globalisation”, and to take a prominent role in helping developing nations protect their soils from unsustainable uses and the conversion of areas of high quality soils into non-agricultural uses.

4. Significant Scientific Factors to Consider in the Development of Successful Legal Frameworks for Soil Law

In summary, it is suggested that there are a number of basic scientific factors that should be considered in approaching new legal frameworks for soil. These include:

- A recognition that soil degradation has a significant impact on the total environment;

⁸⁷ See discussion on the concept of the “global farm” in El-Swaify *et al*, *op. cit.*

⁸⁸ See Concepcion, R.N. and G.P., Nilo, 2001, “Law and Policy to Manage Land Degradation in the Philippines”, in *op. cit.* Bridges *et al*; see also, Kaul, I., I. Grunberg and M. Stern, Eds., 1999, *Global Public Goods – International Cooperation in the 21st Century*, UNDP, Oxford University Press.

⁸⁹ See Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, Marrakesh, 15 April 1994; Ewing, K.P. & R.G. Tarasofsky, 1999, The “Trade & Environment” Agenda: Survey of Major Issues & Proposals, From Marrakesh to Singapore, Commissioned by International Council on Environmental Law, Environmental Policy and Law Paper No. 33, IUCN Environmental Law Centre, IUCN – The World Conservation Union.

- The extent, type, degree and severity of soil degradation vary between one soil landscape and another. Soil degradation affects the global environment because it represents a loss of integral components of the world's ecosystems and global biodiversity;
- Good quality soils used for agriculture are being lost to non-agricultural uses, especially through urbanisation;
- Soil degradation causes damage to the soil resource by erosion, contamination, change of physical or chemical state (e.g., acidification, compaction, salinisation) and loss of nutrients and organic matter;
- A significant proportion of the degradation of the atmosphere is due to greenhouse gas emissions caused by various forms of soil use associated with agriculture;
- Loss of biodiversity is generally related to land use changes, including deforestation, agricultural intensification and urban expansion, which cause soil degradation;
- Accelerated soil degradation is mostly human-induced and occurs in all eco-regions of the world, irrespective of social, economic, and political conditions; and
- Accelerated soil degradation exacerbates the scarcity of productive lands and is a major threat to global food security.

A number of current global land resource use characteristics give some direction to the need and content of improved national and international soil legal frameworks, including:⁹⁰

- The uneven spatial and temporal distribution among nations of populations and consumption needs.
- The uneven distribution of productive, unutilised, and under-utilised and degrading soils.
- The substantial variation in cropping systems.
- Areas of surplus production and of food deficit.
- Variation in the availability of capital for soil protection.
- The opportunities that exist to transfer knowledge on sustainable use of soils, combating degradation, and achievement of sustainable land management.
- The global soil environment should be independent of political boundaries.

⁹⁰ See Wood, S., K. Sebastian and S.J. Scherr, 2000, *Pilot Analysis of Global Ecosystems, Agroecosystems*, International Food Policy Research Institute and World Resources Institute, Washington D.C.

Section 4

IV. National Legal and Institutional Frameworks

The development of frameworks for national soil legislation should be approached from a sound conceptual and ethical basis, with the goal of protecting and managing the ecological aspects of soil to enable its use in a sustainable manner. For such a framework to be effective, States must be willing to accept new values in a legal system for the soil. A primary objective of this preliminary report is to outline the elements that may be appropriate for national soil legislation, which can be used as a guide to States. The elements are “generic” at this level and individual States would need to ensure that adequate background work is undertaken to clearly identify the actual physical, cultural, institutional and socio-economic issues which need to be taken into consideration when preparing specific national soil legislation. States have the freedom to clearly and distinctly address an actual domestic soil protection or management issue, and specific provisions should be developed to satisfy the local, regional or State situation. In this context, the objective for “Soils” in the Montevideo Programme III, to promote the development and implementation of laws and policies “to improve the conservation, rehabilitation and sustainable use of soils”, is a useful guide as to what the elements of a generic soil legislation framework might be.

1. Existing National Soil Legal Frameworks

An examination of existing national soil legislation has been conducted using data from the FAOLEX and ELIS databases⁹¹ and other primary sources (published literature, acts, etc).⁹² At the global level, a broad range of legal mechanisms have been used over many decades to protect and manage soil, including acts, decrees, resolutions, ordinances, codes, regulations, circulars, decisions, orders and by-laws. The legislation of around 100 countries was examined; however the actual number of individual laws is substantially greater than the number of individual countries as some countries have multiple mechanisms within their soil legislation frameworks (i.e., a principal act accompanied by a code, a regulation, ordinance, etc). Some jurisdictions, such as the United Kingdom have multiple soil legislation mechanisms that cover a broad range of functions including, soil planning, access, organic farming practices, nitrate sensitive areas, and soil restoration, while federally organised countries, multiple states or provinces (e.g., United States of America, Australia, Italy, India), have a system where each state or province has its own soil legislation and supportive legal mechanisms.⁹³

Some examples of varying systems include:

Hungary – which has a soil legislation framework consisting of:

- Law No LIII of 1995 on General Rules Concerning Environmental Protection.
- Act LV of 1994 on Arable Land
- Decree No 24 of 1995 of the Ministry of Agriculture on Plant Protection and Soil Conservation Stations.
- Act I of 1987 (The Land Act) for soil protection.

⁹¹ FAOLEX is the legal database of the Food and Agriculture Organization of the United Nations; ELIS is the environmental law information system of the IUCN.

⁹² Searches were made under the key terms “soil conservation”, “soil erosion”, and “soil pollution/quality”. Searches were also conducted of key related terms like “farming systems”, “sustainable land use”, etc, but only the legislation which related directly to the terms of reference of this report, were examined.

⁹³ See e.g., op. cit. Bradsen; Tran *et al*, and Krasnova.

Norway – which has a soil legislation framework consisting of:

- A 1999 decree relating to incentives for alternative treatment of the soil.
- A 1999 decree relating to planning of the use of fertilising substances.
- A 1998 decree relating to animal manure.
- A 1995 decree relating to waste sludge.
- A 1990 decree relating to incentives for measures for the prevention of soil erosion.

2. Soil Legislation Framework Categories

The individual acts, decrees, regulations, etc examined in the body of soil legislation above, were summarised into eight specific categories of soil legislation. The eight principal categories represent the *principal intent* of the individual soil legal mechanisms examined in the body of legislation.⁹⁴ The eight categories are:

- (i) Principal soil conservation law.
- (ii) Protecting land for soil conservation purposes.
- (iii) Protecting soil in forest land and agricultural land.
- (iv) Legislation specifically for soil erosion control.
- (v) Legislation specifically to manage soil pollution.
- (vi) Legislation to establish soil conservation committees and boards.
- (vii) Legislation to establish soil conservation institutions or an authority.
- (viii) Miscellaneous category.

2.1 Principal Soil Conservation Law

This category includes the comprehensive soil conservation statutes with a plethora of “traditional” legal elements considered necessary to conserve soil. This framework has evolved from the American Federal Soil Conservation Law which commenced in 1935.⁹⁵ In a hierarchical fashion, they provide a wide range of legal mechanisms that give an equally wide range of choices in the way that soil conservation may be undertaken. Other countries with statutes in this category include Australia, Cyprus, Canada, Hungary, Sri Lanka, Iceland, Thailand, and China.⁹⁶ The principal legal elements may include:

- Provisions to set up a soil institution.
- Appointment of a departmental head.
- Establishment of advisory committees.

⁹⁴ It is also feasible to break these broad categories into even finer categories based on various combinations of elements used in the legislation.

⁹⁵ US Soil Conservation Act of 1935 and the 1937 Standard Soil Conservation District Law served as a model for many State and local laws on resource conservation.

⁹⁶ Specific examples are: *Law of the People’s Republic of China on Water and Soil Conservation 1991*; Canada, *Soil Conservation Act 1996*; New South Wales, Australia, *Soil Conservation Act 1938*.

- Soil conservation planning provisions (soil survey, catchment planning and farm planning).
- Establishment of soil conservation schemes of works (practical soil conservation projects).
- Development of legal agreements between the State and individuals to implement soil conservation works (usually providing some financial assistance).
- Acquisition of land for special soil conservation restoration projects.
- Enforcement and compliance procedures.

2.2 Protecting Land for Soil Conservation Purposes

This category features mainly statutes, regulations and ordinances which manage and protect land or soil with an important physical characteristic. In some cases it is used to preserve the existing high conservation values of these features, whereas in other cases, it is used to restore or rehabilitate a land feature that has been subjected to some form of soil degradation process (e.g., soil erosion on over-grazed alpine land). The main intent of this type of law is to focus soil protection and management on a principal landscape element. Examples of countries with this type of legal framework include, Albania, Bulgaria, Cape Verde, Fiji, Gambia, Germany, Grenada, Hungary, Italy, Lebanon, Pakistan, Russia, Tanzania, UK, and Vietnam.⁹⁷ The principal legal elements may include:

- Specification of land use activities.
- Land set aside for soil conservation purposes.
- Specific protection of soil, plants and forest.
- A specification of land tenures (e.g., private land, state-owned land).
- A specification of land types (e.g., forests and forest soils, steep land, alpine meadow, rangeland, prime quality agricultural soil).
- Prohibiting interference with or removal of a particular soil type (e.g., sandy soils, peat soils).
- Specification of the types of prohibitive activity (e.g., no burning, stock grazing levels, no removal of vegetation).
- Specification of particular types of restorative measures.
- Specification of preparation of maps and plans to guide land management.

2.3 Protecting Soil in Forestland and Agricultural Land

There are a number of countries with individual statutes, decrees, regulations, ordinances, and codes specifically to protect and manage (preserve) forestland, and land with high quality agricultural soils, with soil conservation provisions. Examples of countries with this type of legal

⁹⁷ E.g., see, Albania, *Pastures and Meadows Law of 1995*; Bulgaria, *Law on the Soil 1991*; *The Law of Desertification Prevention and Control of the People's Republic of China 2001*.

framework include, Canada, China, Czech Republic, Hungary, Indonesia, Kyrgystan, Laos, Montserrat, Namibia, Norway, Pakistan, Portugal, Romania, Slovak Republic, St Vincent and Grenadines, Turkey, UK, Vietnam, and Zambia.⁹⁸ The principal legal elements may include:

- Declaration of land as “forest” (e.g., forest management to prevent erosion) or “agricultural soils” (e.g., for agricultural land uses only, specifying the particular types of crops that can be grown to control wind erosion, etc).
- Establishment of afforestation projects.
- Specification of the type and intensity of land use activity (fertiliser use, use of animal manure).
- Specification of soil conservation methods (slope management, cropping regimes, land planning, watershed planning).
- Specification of the types of penalty provisions and other enforcement actions.

2.4 Legislation Specifically for Soil Erosion Control

There is a category of legislation that specifically deals with the control of soil erosion by water and wind processes. Special regulations, codes, ordinances and orders have been used to set out rules for the control and prevention of soil erosion. They are usually quite simple in their approach and often have minimal or no enforcement mechanisms. In some instances (e.g., Portugal), a resolution has been passed to develop a national policy on soil conservation. Examples of individual countries which have used the specific soil erosion control approach include, Albania, Azerbaijan, Gambia, Grenada, India, Italy, Kyrgystan, Malaysia, Nepal, Pakistan, Portugal, Russia, and Tanzania.⁹⁹ The principal legal elements may include:

- Specification of particular soil conservation measures to control and prevent soil erosion (e.g., method of ploughing).
- Identification of areas of soil erosion.
- Development of soil erosion control plans.
- Outline of methods of rehabilitation (afforestation, pasture establishment, crop types).
- Specifying landscape and land use limits (e.g., upper slope limits for cultivation, grazing levels, no burning).
- Specifying the formation of a committee or board to oversee the implementation of soil erosion control works.
- Incentives for soil erosion control.

⁹⁸ E.g., see Czech Republic, *Regulation of the Relations of Ownership of Land and other Agrarian Property 1991*; Portugal, *Order No 533-D/2000, Approving the Regulation on Support for Rural Development*.

⁹⁹ E.g., see Azerbaijan, *Land Code of the Azerbaijan Republic 1991*; Nepal, *Soil and Water Conservation Act 1982*; Russia, *Decisions Concerning Urgent Measures for Soil Protection against Wind and Water Erosion 1983, No 27, Article 156*.

2.5 Legislation Specifically to Manage Soil Pollution

This type of soil legislation is mainly confined to Europe and some Scandinavian countries to control various agricultural activities that endanger the health and quality of the soil.¹⁰⁰ The principal legal elements may include:

- Specifications for the use of sludge on agricultural land (handling, depositing sludge).
- Specification of “nitrate vulnerable zones” and “nitrate sensitive areas”.
- Specifications for the control of discharges of pollutants and wastes onto the soil.
- Specification of the agricultural methods that are compatible with a sensitive or vulnerable soil environment.
- Specifications for use of fertilisers and fertiliser substances.
- Specifications for permissible contents of hazardous substances in soil.
- Specification of methods to manage contaminated sites.

2.6 Legislation to Establish Soil Conservation Committees and Boards

There is a body of soil legislation which focuses on the establishment of a soil erosion committee, body corporate, an inter-agency group, district council, or board. Examples include, Botswana, the Cayman Islands, Fiji, Ghana, Namibia, Saint Lucia, Sri Lanka, Tajikistan, and Tanzania.¹⁰¹ This legislation includes elements which:

- Outline the make-up of the respective committee, etc, and its line of responsibility;
- Specify the powers to control soil erosion and in some instances, resumption of land for soil conservation purposes and reclamation of land;
- Outline a supervisory role over land and water resources; and
- Specify a type of land, or area of land for implementation of soil erosion control works (e.g., watershed, catchment areas).

2.7 Legislation to Establish Soil Conservation Institutions or an Authority

There is a varied group of statutes which provide for the establishment of some form of institution for soil conservation (e.g., the Philippines) or for the establishment of specialised institutions to investigate and carry out experiments on soil conservation problems (e.g., Hungary, Lebanon, the

¹⁰⁰ E.g., see, the Netherlands, *Soil Protection Act 1994*.

¹⁰¹ E.g., see Botswana, *Agricultural Resources Conservation Act 1972*, Tanzania, *Nkansi District Council (Prevention of Soil Erosion and Water Conservation) By Laws 1994*.

Netherlands and Syria).¹⁰² This legislation is generally quite limited, usually just providing for the establishment of institutions of the following type:

- Soil conservation station;
- Centre for reforestation and soil conservation experiments;
- Technical commission for soil protection;
- Soil conservation bureau;
- Soil conservation laboratory; and
- Soil conservation planning commission.

2.8 Miscellaneous Category

This category was used to place the “one-off” types of soil legislation, and includes, e.g.:

- The Soil and Water Conservation Agreement between the USA and Micronesia of 1990 for planning and technical assistance;
- The European Union Council regulations¹⁰³ and directives¹⁰⁴ on soil protection, agricultural production methods to protect the countryside; and
- Various United Kingdom regulations that indirectly protect soil by setting aside land for specified periods for regeneration, or to manage an important aspect of nature (e.g., habitat areas, and “land in care”).

3. Overview of National Soil Legislation

The above analysis indicates that individual States have adopted a variety of approaches to frame domestic soil legislation and to deal with specific soil protection and management problems. This is generally reflected by the broad structural features of the eight categories, as well as in the variety of specific mechanisms used to protect and manage soil and land use.

Some observations are:

- From a global perspective, the cumulative picture is that States have been reasonably creative and innovative in the choice and application of individual mechanisms;

¹⁰² E.g., see Lebanon, *Resolution No 27/1 Creating a centre for afforestation experiments and nurseries in the zone of Shtura-Beqa 1995*; Hungary, *Decree No 24 of 1995 of the Ministry of Agriculture on plant protection and soil conservation stations*.

¹⁰³ E.g., see European Union Council Regulation No 2087/92 of 30 June 1992 on *Agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside*.

¹⁰⁴ E.g., see European Union Council Directive 86/278 of 12 June 1986 on *The protection of the environment, and in particular of the soil, when sludge is used in agriculture*.

- A general feature is that many individual statutes are used to rectify a soil problem caused by poor land use planning or inappropriate land use in the first place, as against the inherent ecological characteristics of soil being used as the premise for land use decision-making;
- A dominant characteristic of existing national soil legislation is that it is still very much overshadowed by the physical problems of land use, mainly agriculture and forestry (i.e., too much private interest and insufficient public interest);
- The primary soil functions are not well represented in the legislation of most jurisdictions and only a few laws refer to the ecological features or needs of the soil;
- The legislation does not acknowledge soil as an ecological element with a central role in terrestrial ecology, the conservation of biodiversity and maintenance of environmental amenity;
- Many individual laws do not have a clear statement of purpose or objectives. In other cases, the stated intention of the legislation is poorly reflected in the elements of the legislation;
- There is often not a logical development of the elements and many laws do not include the range of elements necessary to effectively protect or manage the particular soil problem;
- There is an absence of any consistency in the use of standard soil terminology, and often there is an absence of definitions, inadequate or poorly stated definitions;
- There are also many examples where the exact meaning or intention of the element is not apparent;
- The structure of some laws indicates that they are a reaction to a political or institutional issue, rather than being designed to effectively manage the soil; and
- Some States have developed a framework of legislation to manage a number of distinct soil and land use problems but generally lack a linking or coordinating mechanism.

In summary, it is observed that many of the basic elements considered essential for the sustainable use of soil are represented in this body of law. However, across the board, the manner in which many provisions are written makes them very difficult if not impossible to enforce.

4. A Way Forward to Improve National Soil Legislation

To set the scene for improved soil legislation, a number of key factors need to be identified as the main philosophical basis on which to approach the development of national soil legislation frameworks. Five important factors are:

4.1 Natural Rights for Soil

The concept of natural rights as it relates to the environment is well known.¹⁰⁵ All aspects of ecology should be properly considered by legislation and in the case of soil, its fundamental role in ecosystem functioning and management should receive particular consideration. Legislation should give close attention to ecological factors as well as reflecting an ecological consciousness that enhances the concept of natural rights of soil as an element of nature.

¹⁰⁵ See Nash, R. F., 1990, *The Rights of Nature, A History of Environmental Ethics*, Primavera Press, Australia.

4.2 The Public Trust Doctrine

The doctrine of public trust balances environmental concerns against the private property rights ethic.¹⁰⁶ The natural values of soil must be protected by governmental mechanisms including legislation, in the public interest. As soil degradation affects the whole community, the obligations attaching to the private ownership of soil, particularly obligations arising from the private use of soil, must be reconsidered in a national legislative regime for soil.

4.3 The Precautionary Principle

The precautionary principle states that “where there are threats of serious or irreversible damage a lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation”.¹⁰⁷ In the case of soil, this means that specific provision to research and study the soil, using environmental regulation, and allocating adequate resources to avoid soil degradation are essential for soil legislation.

4.4 Conservation of Biological Diversity

The conservation of biological diversity is a key element of the sustainable use of soil, and helps underpin the wellbeing of society through the provision of ecological services such as those that are essential to maintain soil fertility. Provisions in soil legislation for the planning and control of land development, including environmental impact assessment, are critical to the conservation of biological diversity.¹⁰⁸

4.5 Definitional Issues

In considering new soil legislation, the opportunity exists for States to adopt new expressions, to link key scientific principles, and to better explain the relationship between them. Two new ecologically-based definitions relevant to the sustainable use of soil which have been discussed in section 2 of this report, are:¹⁰⁹

- The ecological integrity of the soil – *which is the preservation of the ecosystems, including the prevention of loss of their wholeness, so as to prevent the commencement of soil degradation, to control existing soil degradation, and to protect and manage soil for its sustainable use.*
- Ecological soil standards – *which is any process to maintain or improve the ecological integrity of soil.*

¹⁰⁶ Sax. J., 1989, *The Law of the Livable Planet*, Lawasia and National Environmental Law Association of Australia, International Conference on Environmental Law, Australia.

¹⁰⁷ Cameron, J., and J. Abouchar, 1991, “The Precautionary Principle, A Fundamental Principle of Law and Policy for the Protection of the Global Environment”, in *Boston College International and Comparative Law Review*, 4:1-27, Boston College Law School, Newton Centre, MA, USA; see also *op. cit. The Rio Declaration on Environment and Development 1992*, Principle 15; and the Preamble to the *Convention on Biological Diversity*.

¹⁰⁸ *Op. cit. De Klemm et al.*

¹⁰⁹ *Op. cit. Hannam, 1992.*

5. Principles of National Soil Legislation

To assist States to approach the development of a suitable national soil law framework, with an appropriate mix of legal and soil protection and management tools, States may benefit from access to a set of “generic elements” from which to select appropriate elements for the construction of a State soil law. States will also need good supportive information to successfully deal with the physical issues relating to the law, that is the intrinsic factors: land characteristics; soil degradation processes; extent and impact of soil degradation; soil degradation causative agents; and measures to control the rate and extent of soil degradation. Taking the key soil scientific issues raised in section 2 and applying them in the context of legal issues raised in section 3, it is reasonable to suggest that the main principles of national soil legislation would cover:

- The general purpose, objectives and duties of care of a legal system to protect and manage soil;
- An institutional system for the sustainable use of soil;
- An outline of the procedures and processes for soil protection and management;
- Financing soil protection and management works and schemes;
- Accessibility of soil knowledge and information;
- Participation of the public in soil planning and decision-making;
- Regulation and enforcement; and
- Payment of compensation under certain situations.

The recommended general range of legal principles for national soil law, for which the specific elements can then be developed, would include (at least) the principles which convey:

- A comprehensive statement of the purposes of the soil legislation;
- Goals and objectives with a mandate for ecologically sustainable soil (specific objectives can be formulated from the objectives and principles of relevant global conventions, strategies and policies concerning ecology, the conservation of nature, biodiversity and sustainable land management);
- The preparation of soil policy, special codes of practice, soil sustainability indicators and the physical and ecological limits of soil;
- That sustainable use of soil can be achieved through a mix of regulatory and non-regulatory means, including land management incentive and support programs, and community soil advisory groups;
- That soil is to be conserved and managed on all classes of land. Provisions to develop plans of management that are based on sustainable soil criteria and contain ecologically sustainable soil standards;
- That the soil law will contribute to the conservation and management of natural resources generally, including provisions to protect biodiversity and soil ecological values;
- A geographic perspective for soil protection and management, including State, regional and local soil conservation plans;

- An equitable distribution of responsibilities among the actors involved in soil conservation, including the State, Minister, administrators, advisory bodies, officials, and the community;
- The proper evaluation of land resources and mapping of soil degradation, preparation of soil resource plans, watershed classification, soil capability mapping, and the implementation of soil management plans at the national, provincial and local/farm levels;
- The preparation of a soil strategy, outlining national soil conservation policy, and a policy to manage specific soil degradation problems;
- That a State can enter into a legal property agreement for the sustainable use of soil with landowners or land occupiers;
- A facility for the community to participate in soil conservation planning and decision-making, including establishing community soil advisory groups, soil plan preparation, publicly exhibiting draft soil plans and policies, strategies, etc, and calling for public submissions, and provision for community representatives to sit on formal departmental soil committees;
- That a State will develop and implement formal education programs on sustainable use of soil, conservation techniques, development and implementation of technical seminars, and conferences;
- That a State will develop and implement a variety of soil conservation research and investigation programs, with desired research outcomes, and to relate these outcomes to State programs (e.g., rainfall and runoff and sedimentation investigations, mechanical and vegetative conservation techniques, land evaluation and land survey methodology, research into sustainable land use limits for a range of land use types); and
- That a State will take formal action where prescribed standards of soil use are not being met and where there has been a particular contravention of the legislation. This may include statutory notices that specify soil rehabilitation requirements and techniques, procedures for prosecution and cross-compliance actions.

6. Broad Strategy

It is appreciated that some States may prefer to develop soil strategies with a minimum of legal regulation, whereas others may prefer a stronger regulatory law.

6.1 Non-Regulatory Strategies

Non-regulatory strategies would feature a predominance of elements that concentrate on:

- Extension, education and awareness programs for sustainable use of soil;
- Ecosystem research, assessment and monitoring of soil use;
- Financial support for research and extension;
- Support and development of participatory community soil planning;
- Development of ecologically sustainable soil standards and practices; and
- Development of soil management, protection and incentive-based programs.

6.2 Regulatory Strategies

Regulatory strategies would feature a predominance of elements that concentrate on:

- Development of statutory land use plans that prescribe limits and targets of land use (e.g., maximum number of livestock at particular times of the year, permissible cultivation practices);
- Issue of licenses or permits to control land use (these would prescribe use entitlements relating to fencing, stock numbers, access, soil restoration requirements, etc);
- Land use agreements between the State and individuals, or groups of land owners, which set legally-binding land use standards;
- The use of restraining notices where sustainable soil use limits (as set out in a statutory plan or agreement) are exceeded; and
- Prosecution for failure to follow prescribed standards of sustainable use of soil.

7. An Analytical Process

Experience gained from several reforms of soil law and from issues raised at a number of soil forums, indicates that there are at least six major areas of activity (expanded on below) that should be considered in a soil law regime and that they can be applied in at least two modes.¹¹⁰

The six components are:

- (i) The background analysis.
 - (ii) Interpretation of the background issues in a land management context.
 - (iii) Developing the law for sustainable use of soil.
 - (iv) Key international principles.
 - (v) Developing reform profiles and options.
 - (vi) The community.
- The six components can be used as a “standard” to compare existing legislation and policy in any particular jurisdiction, and as a method of determining the effectiveness of implementation and enforcement.
 - The six components can be used as a framework to approach the development of new national soil law.

The six components can be rearranged, as appropriate, and supplemented with additional elements, to accommodate essential local and national requirements for the sustainable use of soil.

¹¹⁰ E.g., the International Soil Conservation Organisation Conferences; the International Land Degradation Conferences; see also Hannam, I.D., 2001, “Developing National Environmental Law and Policy for Soil Conservation”, in *Revista de Direito Ambiental* 18, (Brazilian Environmental Law Journal) Editora Revista Dos Tribunais, Brazil; op. cit. UNEP and FAO, 1999.

7.1 The Background Analysis

7.1.1 Physical Environment

The first part of a successful soil legislation development program should be a study of the physical environment, to understand the principal biophysical elements that influence land use (including climate and landform), and the current status of soil degradation (as an expression of the way land use is conducted and where specific land uses are located). It is essential to have a good understanding of the current land uses and their coincidence with particular soil types, and landscapes, and the intensity of land use.

7.1.2 Existing Legal Framework

The second step is an analysis of the existing legal framework, to summarise the laws that have a role in the management of soil. In addition to specific soil legislation this may include, for example, environmental planning and assessment law, water management law, biodiversity law, environment protection law (pollution control, etc), forest law, land administration law, and cultural and natural heritage law.

7.1.3 Review of Institutions

The third step involves a review of the soil institutions and national agencies that have a role in the management of the physical environment, to obtain a sufficient understanding of their structure and capability to protect and manage soil in a sustainable way. It is important to look at attitudinal characteristics, the available human resources and expertise to deal with sustainable use of soil, and what research there is into the limits of soil in terms of sustainability.

7.2 Interpretation of the Background Issues in a Land Management Context

This consists of a review of the background factors (above), particularly the impacts of agriculture on the soil environment, the strengths and weaknesses of the existing legislation to manage soil degradation, the relationship between the institutions, their land management policies, and the relationship between soil policy and the general environmental policy of the State.

7.3 Developing the Law for Sustainable Use of Soil

This section describes the procedure for the development of new national soil law. This can either be in the form of specific soil legislation, or by integrating legal elements relating to soil within another body of environmental law.

7.3.1 Key Aspects

A realistic time frame needs to be decided in which to consider the institutional characteristics, settle on the best approach to develop new policy, establish the commitment to sustainable use of soil, generate new definitions, decide the legal mechanisms, and delineate the various options for legislative reform. Important parameters include, “what is to be sustained” (e.g., soil nutrients; ecosystem diversity; a land use system), “over how long is a land use activity to be sustainable” (specific number of years, or indefinitely), and “over what area is sustainability sought” (soil groups, ecosystems, State).

7.3.2 Develop an Approach

Adequate time should be allowed to approach the reform strategy, and to review the existing relevant environmental law and policy material. Consideration should be given to generating more

commitment to sustainability (protect fragile soils), the development of a State “sustainable soil” strategy, re-defining “soil conservation” (i.e., sustainable use of soil), and developing sustainable limits and targets for soil use. In adopting the concept of “sustainable use of soil”, there should be emphasis on soil planning, regulatory strategies, including self-regulatory and obtaining adequate soil science information to establish achievable ecological standards for soils.¹¹¹

7.4 Key International Principles

As pointed out in the introductory and background sections of this report, a general obligation exists for States to take into account the goals and objectives of relevant international environmental instruments when preparing new environmental laws. These include, primarily, the CCD and the CBD, but others, such as the Framework Convention on Climate Change (UNFCCC), and various regional agreements, may also have an important role.

7.5 Developing Reform Profiles and Options

There are many possible ways for a State to approach the development of national soil legislation. The following four framework summaries are presented as a guide only. These are presented in a hierarchical form, beginning with a framework for reform of an existing soil law, to a framework for a comprehensive integrated natural resources law. Frameworks 3 and 4 would integrate the legal regulation of soil with a wider, and more encompassing natural resources law. These four frameworks may also be applied within different time frames. In the short term, a State may find it more appropriate to make minimal legislative change, and, as public confidence increases, evolve a more comprehensive and expanded system of natural resources law that promote integration of legal requirements for soil with other environmental legislation.¹¹² The respective elements of the possible soil law options will largely depend upon the attitude, policies and willingness of government and institutions to change. Some frameworks which draw on the principles discussed above and on the more detailed elements set out in the latter part of this section, include the following types of framework:

7.5.1 Framework 1 – Work with an Existing Soil Law

This framework involves making simple machinery amendments to an existing law, e.g., to more clearly define the role and responsibilities of a soil institution, or to import definitions that are consistent with global environmental policy initiatives. Minimal amendment can still produce a more accountable law, by adding, for example:

- A set of objectives for the law.
- Provisions to define the role and responsibilities of the administrators.
- Provisions to enable development of a State soil strategy with accompanying soil protection and management policy.
- Provisions to enable adequate implementation, public participation in decision-making and enforcement.

¹¹¹ See e.g., the United States Department of Agriculture, Soil Conservation Service Action Plan (undated), *Providing Ecosystem-Based Assistance for the Management of Natural Resources*, A Soil Conservation Service Strategic Initiative for the 1990’s.

¹¹² See, e.g., *New Zealand Resource Management Act 1991*; and Williams, D., 1997, *Environmental and Resource Management Law in New Zealand*, Butterworths, Wellington, New Zealand.

7.5.2 Framework 2 – Develop New Soil Legislation to Promote the Role of the State in Sustainable Use of Soil

This framework may include, for example, elements that enable:

- Soil and land evaluation, soil classification, and soil planning.
- Soil and land research.
- Extension and advisory schemes.
- Field soil conservation works.
- Soil policy development.
- Public participation in the development of soil protection and management schemes, and in enforcement.

7.5.3 Framework 3 – Develop Soil Legislation Based on the Concept of Ecosystem Management

This legal framework places soil within an ecosystem context where soil is the central ecological component, but there would also be general responsibilities to link soil management with the management of water, vegetation and land. The successful implementation of this framework would depend on the legislation being administered by an institution with skills in ecology, land evaluation, land classification, land planning, land conservation research, extension and advisory work, field soil conservation works, policy development, and community involvement. This framework moves soil use and management away from an “agricultural land productivity-centred” role, to a more holistic ecosystem management role.

7.5.4 Framework 4 – Integrated Resource Management Law in which Soil is a Principal Component

The successful implementation of framework four is based on a major attitudinal shift toward the management of soil, forest, and water resource responsibilities by a State, and may lead to substantial institutional re-organisation. Structurally, this framework would emphasise elements that should enable interdisciplinary cooperation, centralise all soil expertise, land evaluation, land planning and land management expertise, enable a more efficient process of managing land use reform, establish more efficient relations with other key environmental agencies (e.g., environment protection, environmental planning), create a more efficient process to deal with complex soil planning and management, improve the management of private forest land, and improve the management of agricultural land generally.¹¹³

8. The Community

It is now widely accepted that the community has to be given the opportunity to be involved in State environmental law and policy reform.¹¹⁴ With regard to soil, it is essential that the community be made aware of the present status of soil degradation, how it is affecting State productivity, and the

¹¹³ See New Zealand *Resource Management Act 1991* as one model for an integrated framework.

¹¹⁴ See *op. cit.*, UNEP and FAO, 1999.

impact of soil degradation on general environmental amenity. The role of the different stakeholders in sustainable use of soil should be clearly set out in legislation, including the role of government, non-government organisations and land users. Key concepts, such as “sustainable use of soil”, and the “ecological integrity of soil”, must be carefully and adequately explained. The reform options should be outlined and the community should have the opportunity to respond under a State-managed public participation process.¹¹⁵

The following sets out some suggested components which could be used as a basis for a community issues paper on soil legislation:

8.1 An Outline of Current Soil Degradation in the State

- Review available data on the current soil degradation situation.
- Analyse specific soil degradation problems for an understanding of the degree and severity of each particular process, viz., water erosion, wind erosion, mass movement, waterlogging, excess salts, chemical degradation, physical degradation, and biological degradation.

8.2 A Description of the Soil Problems and Land Management Issues

- Past settlement patterns/land occupation and the impact of land use on the soil environment.
- Current land administration and land use patterns as they affect soil protection and management.
- Relationship between land tenure and environmental impacts (especially ecosystem damage).
- Outline any land and land tenure issues including indigenous and local community rights relevant to sustainable use of soil.

8.3 An Outline of the General Obligations of States to Sustainable Use of Soil and Ecological Sustainability

There should be a reference to the appropriate provisions of:

- Global conventions, including the CCD and the CBD.¹¹⁶
- Sustainable Development Strategies.

¹¹⁵ See e.g., UNEP and the European Environment Agency, 2000, *Down to Earth: Soil Degradation and Sustainable Development in Europe, A Challenge for the 21st Century*, Environmental Issue Series No 16; Department of Environment, Transport and the Regions, 2001, *Draft Soil Strategy for England*, A Consultation Paper, Minister for Agriculture, Fisheries and Forestry, England.

¹¹⁶ May also be useful to refer to, IUCN (The World Conservation Union), 2000, *Draft International Covenant on Environment and Development*, Second Edition: Updated Text, Commission on Environmental Law in Cooperation with International Council of Environmental Law, IUCN Environmental Law Programme.

- The Rio Declaration on Environment and Development and Agenda 21.
- Reference to the Kyoto Protocol to the United Nations Framework Convention on Climate Change and managing soil carbon sequestration.

8.4 The Specific Role of the Community

- Emphasise the need for cooperation from the whole community to plan for future management and to devise strategies to manage problems in “partnership” with government, outline the role of Government, the role of other agencies and institutions.

8.5 The Role of Government and Relevant Agencies and Institutions

- Set out advantages to a State economy and society from the sustainable use of soil.
- Canvass the concept of protected land and its role in sustainable use of soil.
- Set out the need to manage the soil in an ecosystem context.
- Identify soil hazards and set long-term sustainable limits of soil use, including areas for soil rehabilitation.
- Outline sustainable farming systems and their benefits to soil.

8.6 Promotion of the Concept of a National Soil Strategy

- Suggest the possible essential elements of a national soil strategy.
- Suggest ecological targets and limits of soil use within such a strategy.

8.7 Suggest an Approach to Soil Policy Development, Embracing the Theme of Sustainable Use of Soil

Soil policy should provide for:

- The adoption of ecologically sustainable objectives and principles for soil.
- Soil planning techniques and the role of regulation if soil use fails to meet particular ecological limits.
- Community responsibility to freehold land and to common land – building of a “stewardship” attitude.¹¹⁷
- Actual values of sustainable soil use, and the availability of “soil sustainability” information.
- Supplements or alternatives to degrading land uses.
- Land use planning as a cooperative government-community exercise.

¹¹⁷ A central aspect of the implementation of *Agenda 21*; see also, op. cit. UNEP and FAO, 1999.

8.8 Invitation

- Invite all persons and interest groups to comment on the proposal for national soil legislation.¹¹⁸

9. Examples of National Reform

Recent approaches taken by Australia, Iceland and Thailand, respectively, to reform their environmental law and policy to control soil degradation are set out below. These case studies reflect differences in the social, cultural and physical characteristics, and attitudes toward environmental law reform in each jurisdiction, including the replacement of existing soil conservation law and policy with multi-objective natural resource management law.¹¹⁹

Australia

Each of the six Australian States and its two Territories has some form of soil conservation legislation and policy.¹²⁰ This area of law developed in the early 1930's to control soil erosion and sedimentation in rural areas associated with the environmental effects of excessive land clearing, drought and floods. Two States have approached their legislative reform by developing a hierarchy of integrated legislation, generally covering vegetation management law, soil management law and catchment management law, linked by over-arching environmental planning and assessment legislation. This regime of legislation is supported by environmental policies for threatened species management, coastal land management, wetland management and soil policy. In South Australia the *Pastoral and Land Management and Conservation Act 1989*, the *Soil Conservation and Land Care Act 1989*, the *Native Vegetation Act 1991*, *The Development Act 1993*, the *Environment Protection Act 1993*, and the *Water Resources Act 1997* serve as a comprehensive regime of legislation to manage soil and land degradation. New South Wales has a similar legislative system made up of: the *Soil Conservation Act 1938*; the *Catchment Management Act 1989*; the *Native Vegetation Conservation Act 1997*; the *Environmental Planning and Assessment Act 1979*; the *Threatened Species Conservation Act 1995*; the *Protection of the Environment Administration Act 1992*; the *Protection of the Environment Operations Act 1999*; and *The Water Management Act 2000*.¹²¹ The self-regulatory and voluntary provisions in the Acts encourage a "whole of property" conservation approach, and include property management plans, agricultural land use codes of practice, and regional environmental management plans. The integrated legislative regime is supported by numerous community support projects. Some are provided for under the legislation (e.g., catchment management committees). Many projects are organised and administered under national programs (e.g., Land Care and the National Heritage Trust programs (under the Federal *Natural Heritage Trust Act 1997*) which allocate finance to control and manage inland and coastal land degradation problems, including: catchment planning; native vegetation conservation; coastal dune stabilisation; riverine restoration; and property management.

Iceland

Iceland introduced a soil conservation law, *Log um landgraedslu*, in 1965 to combat serious soil erosion in the pastoral lands. Land degradation has now reached an extreme level and is considered the most severe environmental problem in Iceland. The national land degradation survey undertaken between 1991 and 1996

¹¹⁸ See further, the *Torba Forum*, which is the process being used to coordinate a public debate on the global *Soil Campaign* (Save Our Soils) of the Foundation Charles Leopold Mayer. A principal aspect of this initiative is the legal protection of soils.

¹¹⁹ The case studies are adapted from Hannam, I.D., 2001, "A Global View of the Law and Policy to Manage Land Degradation", in op. cit. Bridges *et al*, p. 388-389.

¹²⁰ Op. cit. Bradsen, 1988; Boer, B.W. and I. Hannam, 1992, "Agrarian Land Law in Australia", in Grossman, M. and W, Brussaard, Eds., *Agrarian Land Law in the Western World*, CAB International, Wallingford, p. 212-233

¹²¹ Op. cit. Hannam, 1998.

reveals that 52% of the country is severely degraded.¹²² The soil conservation law contains provisions to prevent soil erosion and vegetation degradation, to manage stock and restore land, but excludes the support provisions and enforcement capabilities necessary to achieve full ecosystem rehabilitation. In 1996 Iceland commenced the move towards holistic ecosystem management, guided by sustainable development principles.¹²³ This started with a review of the legislation and existing policy; consultation with land user associations and farmer groups; a review of international environmental law, policy and strategies; international consultation and preparation of material for institutional and government review. Its objective was to improve the capability of environmental law and policy to deal with ecosystem decline, control sheep grazing, and to integrate traditional soil conservation practices with sustainable land management regimes.¹²⁴ The national land degradation survey is used to frame new land use policies and the legal parameters of sustainable land use, based on ecological concepts and principles. Changing views of the public to land management has resulted in the application of environmental impact assessment techniques of degraded areas, and stockowners are offered incentives to remove animals from degraded land. Forestry has been accepted as a land use alternative to agriculture in some areas but the exclusion of livestock or strict control over livestock numbers is essential to restore degraded land.¹²⁵ A new Soil Conservation Law is now before the Icelandic Parliament.

Thailand

The high population density of Thailand and the requirement to maintain the economic viability of the agricultural industry has produced laws that focus on access to land, forest and water resources.¹²⁶ The potential of Thailand's soil and water conservation law, the *Land Development Act 1983*, is overshadowed by a range of legislation which focuses on land allocation: the *Land Code of 1954*, the *Forest Act 1941*, the *National Forest Reserves Act 1964*, the *Land Settlement Act 1968*, the *Land Consolidation Act 1974*, and the *Agricultural Land Reform Act 1975*.¹²⁷ Land degradation problems occur in Thailand for many reasons, including: the lack of coordination in the implementation of land use policy; the lack of effective administration and management; the lack of enforcement of land use plans; the uncontrolled expansion of settlement; and the encroachment of urban uses onto high quality agricultural land.¹²⁸ The *Land Development Act* is responsible for the general "utilisation of agricultural land", and provides for land use planning, implementing soil and water conservation projects, and investigating soil improvement techniques. The review of the *Land Development Act* in 1998 produced a number of guiding factors for the environmental law reform process, including: the existing and potential utilisation problems, the type, distribution and status of soil and land degradation, the existing institutional structure, technical expertise and capabilities, land tenure, land administration and land rights, the socio-economics of agriculture, the community perceptions of agriculture as an environmental issue, the legal and technical capabilities of the *Land Development Act*, and the relationship between Land Development policy and Thailand's policy for the enhancement and conservation of national environmental quality.¹²⁹ The key features of the "sustainable land management" legislative and policy model, which was the preferred model to come out of the review work, are a number of provisions which: create a duty of care to land conservation, enable land resource evaluation and soil degradation mapping, implement resource plans and enable the preparation of resource policy. Other important sustainable land management considerations include property agreements with landowners, community involvement in soil conservation planning and decision-making, and provisions to develop and implement formal education programs on sustainable land management and conservation techniques. Thailand's "first stage" of the reform is now before the Parliament, being the *Agricultural Land Protection Act*. The merits of developing a law that deals with management of natural water catchments as an integrated whole have also been canvassed.¹³⁰

¹²² Arnalds, A., 1998, Strategies for Soil Conservation in Iceland, in op. cit. Blume *et al*, p. 919-926; Arnalds, O., 1999, Desertification in Iceland, in Arnalds, O. and S. Archer, Eds., *Rangeland Desertification*, Kluwer, Dordrecht.

¹²³ Hannam, I.D., 1996, Report to the Government of Iceland on Reform of Soil Conservation Policy and Legislation for Sustainable Land Management, Department of Land and Water Conservation, Parramatta, Australia.

¹²⁴ Op. cit. Hannam, 1996.

¹²⁵ Op. cit. Arnalds, 1998 and Arnalds, 1999.

¹²⁶ Chomchan, S., 1988, "Land Resources in Thailand", in Arbhabhirama, A., A. Phantumvanit,

10. Principal Elements for National Soil Legislation

The elements for national soil legislation will be developed and detailed in the next stage of this project. They are intended to become a guide as to the type of elements that States may need to approach the task of reform of existing legislation or to set the direction for the drafting of new law. It is important for any State who uses the generic legislative elements to ensure they undertake adequate background work to clearly identify the ecological, cultural, institutional, socio-economic, and land use functions of soil in as far as they may indicate the best way to approach soil legislation reform.

The legislative guidelines to be developed in the next stage of the project will normally need to be rewritten by a State to clearly reflect the actual domestic situation, and where appropriate, new articles would be constructed to satisfy local, regional or national requirements. The areas covered should at least include:

- Definitions;
- General elements;
- Organisational system to protect soil;
- Soil management procedures;
- Financing soil protection;
- Right to information on sustainable use of soil and public participation;
- Proceedings in soil environmental matters;
- Regulatory tools; and
- Sanctions and enforcement measures.

J. Elkington and P. Ingkasuwan, Eds., *Thailand: Natural Resources Profile*, Oxford University Press, Oxford.

¹²⁷ Hannam, I.D., 1998, Report to the Government of the Kingdom of Thailand on Reform of Land Development Legislation and Policy, Department of Land and Water Conservation, Parramatta, Australia.

¹²⁸ Office of Environmental Policy and Planning, 1997, *Policy and Prospective Plan for Enhancement and Conservation of National Environmental Quality, 1997-2016*, Ministry of Science, Technology and Environment, Bangkok.

¹²⁹ Op. cit. Office of Environmental Policy and Planning, 1997; and Hannam, 1998.

¹³⁰ Wongbandit, A., 1996, "Legal and administrative aspects of watershed resources management in Thailand", in Sharma, P., Ed., *Participatory Processes for Integrated Watershed Management*, p. 61-64, Participatory Watershed Management Training in Asia and Farmer-Centred Agricultural Resource Management Programmes, Kathmandu; Ministry for the Environment, 1996, *Sustainable Land Management, A Strategy for New Zealand*, Ministry for the Environment, Wellington.

Section 5

V. International Legal and Institutional Regimes for Soil

1. Existing Regimes

This section overviews existing international and regional instruments that make reference to soils in some manner. It discusses various relationships between different hard and soft law mechanisms that have been developed in the international environmental law as they relate to soil. While the problem of soil and land degradation has not gone unnoticed by the world community there has been little discussion until recently on the role of international environmental law and soil degradation. One particular study discusses the types of hard and soft law available which relate to the topic of land degradation but it does not analyse the law for its ability to control or manage land degradation nor make any suggestions as to how it may be improved or rationalised.¹³¹

A key response to the rapidly changing political and social aspects of the world and the ever-expanding environmental problems has been the accelerated development of international and domestic environmental law. Environmental law is an essential component for setting and implementing global, regional, and national policy on environment and development.¹³² There is an increasing recognition of the role of international environmental law to overcome the global problem of soil degradation, including its ability to provide a juridical basis for action by nations and the international community. Global conventions, treaties and protocols are assuming increased importance as international relations grow in their political, economic, and social complexity and sensitivity and as the world's interdependence intensifies. In recent years, the United Nations has paid growing attention to environmental issues and many countries have signed various individual international environmental treaties relating to climate change, biodiversity, desertification, trade in hazardous wastes, endangered species, the ozone layer, and wetlands. These are all issues that relate, in one way, or another, to the use of the land and its soil. The increasing number of nations becoming signatories to these treaties reflects "the realisation of the need for international cooperation and understanding between respective nations." In general, governments tend to enter into treaties cautiously and there is usually considerable community discussion to fully understand the environmental, economic and social benefits of a new treaty. The fundamental considerations in any decision to participate in the negotiation of an environmental treaty or to accept its obligations include not only the protection of the environment, but a nation's strategic, economic and commercial interests.

Agenda 21, the action plan from the 1992 UN Conference on Environment and Development (UNCED), identified concrete steps to integrate environment and development. However, UNCED further endorsed the role of environmental law in guiding all nations toward integration and through *Agenda 21* emphasises the need to integrate "environment and development issues at national, sub-regional, regional and international levels", including:

- Elaborating the balance between environmental and developmental concerns.
- Clarifying the relationships between the various existing treaties.

¹³¹ See Khan, R., 1993, "International Law of Land Degradation", in *International Studies* 30:3. Sage Publications, New Delhi, Newbury Park, London.

¹³² See p xiii, op. cit. IUCN draft International Covenant on Environment and Development and UNEP, 1996, *Handbook of Environmental Law*, UNEP, Nairobi.

- Ensuring national participation in both developing and implementing these legal measures, with particular focus on developing countries.¹³³

2. The Nature of International Instruments: Binding and Non-Binding Legal Instruments

The investigation into a suitable international legal framework for soil can be approached through the two broad categories of environmental law instruments, i.e., binding and non-binding instruments.¹³⁴ In relation to their application to the sustainable use of soil, it is important to be aware of the advantages and disadvantages of each type of instrument in respect of such factors as:

- The timeliness of any proposal for a new international instrument for soil.
- The political acceptability of a particular proposal.
- The ecological complexity of soil and how this might be effectively dealt with by a particular form of instrument.
- The technical ability of developing nations to implement an international instrument for sustainable use of soil.
- The finances and resources required for effective implementation of a new instrument.

2.1 Binding Instruments

Binding instruments are agreements between States (treaties or conventions) which have a mandatory character and must be observed and their obligations performed in good faith. Binding instruments often require a lengthy negotiation process and they rarely contain detailed rules. Detailed rules are commonly developed by way of a protocol under a treaty. In most cases, they are subject to ratification, a process by which each individual state, whether or not it participated in the adoption of the text, agrees to be bound by its provisions.

2.2 Non-Binding Instruments

Non-binding instruments, sometimes referred to as “soft law”, are resolutions adopted by inter-governmental bodies, and they can be in the form of recommendations, guidelines, programs of action, and declarations of principles. States accept them as a guide for future action, despite not being mandatory. Elements of “soft law” may be included at a later stage in binding instruments, and thus become “hard law”. This reflects the evolutionary character of international law on a particular subject. The main feature of non-binding instruments over binding instruments is that they can be completed within a shorter timeframe because they are not mandatory and do not require ratification. A non-binding instrument can also be in the format of international guidelines and statements of “best practice”, such as a code of conduct.

¹³³ *Agenda 21*, Chapter 39, “International Legal Instruments and Mechanisms,” at 39.1.

¹³⁴ For a more detailed explanation of these terms see, United Nations, 1999, *United Nations Treaty Collection: Treaty Reference Guide*.

3. Multilateral Environmental Treaties and Other Agreements

Since the early 1900's, over 200 multilateral environmental treaties, agreements and protocols have been developed, covering flora and fauna conservation, protection of fisheries, pollution management, regional conservation protection, Antarctic conservation, settling disputes, civil liberties in relation to environmental damage, protection of world cultural and natural heritage, endangered species, and landscape protection.¹³⁵ While a number of these contain elements that can assist in achieving sustainable use of soil, it is contended that none are sufficient in their own right to meet the requirements of international environmental law in relation to soil. Some of the existing instruments assist by managing some of the activities that directly lead to, or can control, soil degradation but this role is not readily apparent.

3.1 Non-Binding International Instruments

3.1.1 The Stockholm Declaration

The 1972 Stockholm Conference on the Human Environment placed global environmental issues firmly on the international agenda for the first time and produced two principal instruments, *The Stockholm Declaration on the Human Environment* (Stockholm Declaration), and the *Action Plan for the Human Environment*. These have had a continuing influence on international and national environmental action for the past three decades.¹³⁶ UNEP was established as a result of the Stockholm Conference. The 1972 Conference sought common effort to preserve and improve the human environment, particularly through the enhancement of environmental policies, environmental planning and legal measures. However, in 1982, after reviewing the measures taken to implement the 1972 Declaration and the Action Plan, the Stockholm Conference expressed serious concern over the state of the environment and recognised an urgency to intensify efforts at the global, regional and national levels to protect and improve the environment. In particular, *The Nairobi Declaration* pointed out that deforestation, soil degradation and desertification had reached alarming proportions and were seriously endangering living conditions in large parts of the world.¹³⁷

3.1.2 The Rio Declaration and Agenda 21

The *Rio Declaration on Environment and Development* (1992) reaffirmed *The Stockholm Declaration on the Human Environment* and established the goal of a new and equitable global partnership through the creation of new levels of cooperation among States, key sectors of society and individuals. It emphasised the need for States to work towards international agreements to protect the integrity of the global environmental system and to enact effective environmental legislation (Principle 11).

Three chapters of *Agenda 21* discuss international environmental law processes to assist in the global management of land degradation.

- Chapter 8 outlines the essential environmental management requirements that can be integrated within policies and practices to develop and implement enforceable and effective laws and regulations.

¹³⁵ Op. cit. UNEP, 1996.

¹³⁶ Op. cit. UNEP, 1996.

¹³⁷ Op. cit. UNEP, 1996.

- Chapter 38 sets out the mandate of various agreements of the United Nations system. This chapter also designates UNEP as the principal UN body in the field of the environment. UNEP's principal environmental actions are to: enhance the capacity of nations to participate effectively in the development and implementation of environmental law, promote the effective implementation of international legal instruments, and promote public awareness, education, and participation in the development of national environmental law regimes.¹³⁸
- Chapter 39 emphasises the further development of international law on sustainable development, giving special attention to the delicate balance between environmental law and developmental concerns and the review and development of international environmental law with a view to evaluating and promoting the efficacy of the law and to promote the integration of environment and development policies through effective international agreements or instruments.¹³⁹

As stated in the introductory part of this report, the global soil science community took up the challenge of the Rio Declaration by commencing the "International Conference on Land Degradation" process (ICLD) in 1995 (Adna, Turkey). The second ICLD was held in 1999 (Kohn Kaen, Thailand) and the third ICLD was held in September 2001 (Rio de Janeiro, Brazil).

3.1.3 The World Charter for Nature

The *World Charter for Nature* of 1982 (initially drafted by IUCN and CEL Members) includes general principles requesting that nature is respected, its essential processes are not impaired, and that all areas of the Earth be subject to the principles of conservation. The Charter called for States to cooperate in the conservation of nature, establish methods to assess the adverse effects on nature, and implement international legal provisions for the conservation of nature and the protection of the environment.¹⁴⁰ Conceptually, the functions of the Charter (Chapter II) are directly applicable to the sustainable use of soil. Function II (b) states that the productivity of soils shall be maintained or enhanced by the use of measures that safeguard their long-term fertility, the processes of organic decomposition, and safeguard against erosion and all other forms of degradation.

3.1.4 The European Soil Charter

As part of the attempt to stop the steady deterioration of land in Europe, the Council of Europe in 1972 adopted a *European Soil Charter* setting out 12 basic principles.¹⁴¹ Adopted by the Council's Committee of Ministers, it included the objective for member States to promote the protection of soils against damage from natural or human causes, and their rehabilitation. Europe is the only region of the world to use this form of non-binding instrument to develop special regional rules for soil. Further, the Council of Europe Soil Protection Policy of 1992 contains the comprehensive definition of "soil" mentioned in section 1 of this report, which is a considerable expansion of the definition of "soil" in Principle 1 of the 1972 European Soil Charter.¹⁴²

This Charter is currently under review by the Secretariat of the Council of Europe with the objective of enhancing it by incorporating new environmental concepts and standards.

¹³⁸ See *op. cit.* UNEP Montevideo Programme III.

¹³⁹ *Op. cit.* *Agenda 21* para 39.1.a.

¹⁴⁰ *World Charter for Nature*, 1982, Nairobi.

¹⁴¹ Council of Europe, 1972, *European Soil Charter*, Strasbourg; note that this instrument follows the concept of the Council of Europe *European Water Charter* of 1968.

¹⁴² *Op. cit.* Council of Europe, 1990.

3.1.5 The World Soil Charter and the World Soils Policy

The *World Soil Charter*¹⁴³ and the *World Soils Policy*¹⁴⁴ were prepared as conjunctive instruments over 20 years ago to encourage international cooperation in the rational use of soil resources. Since that time they have generally been accepted as the global “soft law” for soil. Although they are not legally binding environmental instruments, they have been influential in raising the profile of soil conservation as an international environmental management issue, as well as providing some relatively straightforward guideline material for States to adopt in the preparation of domestic laws and policies. The UNEP *Environmental Guidelines for the Formulation of National Soil Policies*¹⁴⁵ were developed to reflect the concerns of the *World Soil Charter* and the *World Soils Policy* and set out a procedure for preparing national policy with a sustainable land use theme. It is important to note that many principles promoted in the *World Soil Charter* and the *World Soils Policy* still have application today. These include a recognition that soils are non-renewable and finite, and that increasing demands are placed on soils to feed, clothe, house and provide energy for a growing world population and to provide worldwide ecological balance. These instruments called on governments to use sound principles of resource management, enhance soil productivity, prevent soil erosion and degradation, and reduce the loss of prime farmland to non-farm purposes. The concept of the *World Soil Charter* was to encourage international cooperation for the optimum use and conservation of soil. Although less technically comprehensive than the *World Soils Policy*, the *Charter* acknowledged the fragility of the world’s soil resources and that soil conservation was essential to protect the food-producing capability of land resources. It has a set of governing principles and guidelines for future action. The *Charter* has been used as a basis to frame many FAO/UNEP projects, and was influential in the development of national soil policies for Australia, Iceland, Syria, Uganda, Jamaica and Indonesia.¹⁴⁶ Its thirteen principles acknowledge the dependence of humans on the land, the importance of giving high priority to optimum land use, maintenance and improvement of soil productivity and soil conservation, and it explains the effects of soil degradation on the economy and the environment. It acknowledges that individual governments have a responsibility to ensure the best possible land use, improve soil productivity, prevent soil loss, and provide incentives, technical, institutional and legal support.

While both the *Charter* and the *Guidelines* were far-reaching in their intent at the time, having a central ecological theme, they fall well short of the basic necessities of a modern day suitable non-binding “soft law” instrument. For this reason they are not regarded as a suitable framework which could directly evolve into a new international environmental law instrument. The fact that these documents have been in existence for 20 years and the world’s soils now experience far more serious soil degradation than in the early 1980’s, clearly justify the preparation of a new legal framework for soil. That new framework should be based on an understanding of soil problems within the environmental management concepts and implementation mechanisms appropriate for the 21st century.

3.1.6 The World Conservation Strategy

The *World Conservation Strategy* of 1980 (WCS) is a non-binding strategy that was introduced as a plan of action for governments and public bodies around the world, to encourage nations to prepare national conservation strategies to address environmental degradation and resource

¹⁴³ Food and Agriculture Organization of the United Nations, 1982, *World Soil Charter*.

¹⁴⁴ UNEP, 1982, *World Soils Policy*, Nairobi.

¹⁴⁵ Olembo, R.J., Ed., 1983, *Environmental Guidelines for the Formulation of National Soil Policies*, UNEP, Nairobi.

¹⁴⁶ See e.g., Australia, 1983, *A National Soil Conservation Strategy*, Australian Soil Conservation Council, AGPS.

depletion. The WCS identified a range of actions designed to achieve its three key objectives: the maintenance of essential ecological processes and life-support systems, the preservation of genetic diversity, and the sustainable use of species and ecosystems. There is evidence that some nations prepared national soil conservation strategies by using the structure of the WCS.¹⁴⁷ There are many aspects of the WCS that could have been effectively utilised by States to prepare strategic approaches and a national framework for ecologically sustainable development of which soil sustainability could have been a key factor.¹⁴⁸

4. Binding Instruments

4.1 Conventions

There are a number of multilateral agreements with a role that could be used to promote sustainable use of soil but the provisions are generally tangential to the needs of the soil as such. Many of them pre-date the 1990's (i.e. the UNCED period), are predominantly regional in nature, and do not establish specific rules for sustainable use of soils.¹⁴⁹ Three international conventions, in order of relevance, have a soil protection role: the CCD, the CBD and, to a lesser extent, the UNFCCC. There is also a group of regional conventions, protocols and agreements that have a soil protection role, but only one of these is a specific soil instrument – “*The Protocol for the implementation of the Alpine Convention of 1991 in the area of Soil Protection*”. This is the only legally binding instrument in the world specifically for soil.

4.1.1 Convention to Combat Desertification

Desertification and drought are problems of global dimension, affecting all regions of the world, and joint action of the international community is often called upon to combat these problems. Under the CCD¹⁵⁰ “desertification” means land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities (Article 1). The CCD acknowledges that arid, semi-arid and dry sub-humid areas together account for a significant proportion of the earth's land area and is the habitat and source of livelihood for a large segment of its population. The objective of the CCD is to prevent and reduce land degradation, rehabilitate partly degraded land and reclaim desertified land, particularly in countries that experience serious drought. In this regard, it recognises the high concentration of developing countries, notably the least developed countries, which are among those experiencing serious drought and or desertification. It recognises that there must be support by international cooperation

¹⁴⁷ As found in the International Union for the Conservation of Nature and Natural Resources, 1980, *World Conservation Strategy*, Living Resource Conservation for Sustainable Development, Gland, Switzerland.

¹⁴⁸ See Hannam, I.D., 2001, “A Global View of Law and Policy to Manage Land Degradation”, in op. cit. Bridges *et al.*

¹⁴⁹ See e.g., *African Convention on the Conservation of Nature and Natural Resources*, 1968 (note that this Convention is presently being revised); *Convention establishing a Permanent Inter-State Drought Control Committee for the Sahel*, 1967; *ASEAN Agreement on the Conservation of Nature and Natural Resources*, 1985 (not yet in force); *Convention for the Protection of the Natural Resources and Environment of the South Pacific Region*, 1986; *Protocol for the implementation of the Alpine Convention in the field of Town and Country Planning and Sustainable Development*, 1991; *Protocol for the implementation of the Alpine Convention in the field of Mountain Agriculture*, 1991.

¹⁵⁰ UNEP, 1994, *United Nations Convention to Combat Desertification*, Nairobi.

and partnership agreements which contribute to sustainable development. This will involve long-term integrated strategies that focus on the rehabilitation, conservation and sustainable management of land and water resources. It acknowledges the principles of Chapter 12 of *Agenda 21* as the basis for combating desertification. A principal feature of the CCD is that it outlines how countries can approach the development of national action plans, obtain scientific and technical cooperation (Articles 9-18) and supporting measures (Articles 19-21).¹⁵¹ These plans can address many important soil degradation issues and the appropriate methods to protect and manage soil.¹⁵²

It is also considered that, as the CCD currently stands, it is not adequate to be considered an instrument for the protection and sustainable use of soil along the lines of the argument in this report. This is because it does not have the specific type of elements that adequately recognise soil as an individual ecological element, and it does not contain other elements to capture the full range of legal principles and processes to protect and manage soil for its sustainable use. The CCD focuses on the physical process of land degradation, particularly in African nations. However, the geographic focus of the definition of “desertification” in the CCD to arid, semi-arid and dry sub-humid areas excludes important climatic regions of the world that experience very severe soil degradation processes that are encompassed in the physical part of the definition of desertification.¹⁵³ However, at the meeting of the Conference of the Parties in November 2000, a draft additional regional annex for Central and Eastern European countries was adopted.¹⁵⁴ This annex is an accession for the countries of this area to the CCD where these countries experience land degradation problems that fall within the definition of desertification in the Convention but where significant parts of the countries are outside the climatic aspects of the definition. This annexure process enables the CCD to be applied more widely geographically. Further, the CCD could possibly be amended so as to add some additional and special ecological rules for the sustainable use of soil, or that a Protocol could be drafted to directly address these matters.

4.1.2 Convention on Biological Diversity

The CBD¹⁵⁵ came into force in 1995. Its object is to: conserve biological diversity, encourage the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies.¹⁵⁶ It takes into account various rights over those resources (Article 1). The CBD is particularly significant for soil because it recognises that nations

¹⁵¹ Op. cit. Arnalds *et al.*

¹⁵² See Secretariat of the Convention to Combat Desertification, November 2000, *Chart of Key Elements in the CCD National Reports by the Countries in Asia*; and European Commission, 2000, *Analysis of National Reports on the Implementation of the United Nations Convention to Combat Desertification*, Turkey, Lebanon, Jordan and Syria, Drylands Program, International Institute for Environment and Development.

¹⁵³ Under Article 1 of the CCD, the definition of “desertification” applies to arid, semi-arid and sub-humid areas. This refers to “areas, other than polar and sub-polar regions, in which the ratio of annual precipitation to potential evapotranspiration falls within the range from 0.05 to 0.65”.

¹⁵⁴ See UN CCD Conference of the Parties, Fourth Session, ICCD/COP (4)/3/Add.8. 10 November 2000.

¹⁵⁵ Op. cit. *Convention on Biological Diversity*, 1992.

¹⁵⁶ Swanson, T., 1997, *Global Action for Biodiversity*, An international framework for implementing the Convention on Biological Diversity, Earthscan Publications in association with the International Union for the Conservation of Nature and Natural Resources.

have a responsibility for conserving their biological diversity and for using their biological resources (of which it is acknowledged that soil is a key component) in a sustainable manner. In this context, clearly, the ecological element “soil” is implicit within the following two key definitions of the CBD:

(i) “Biological diversity”, which means:

The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems,

and

(ii) “Biological resources”, which includes:

Organisms, populations, or any other biotic component of ecosystems.

Fundamental to the CBD is the concern that biological diversity is being significantly reduced by human activities, and this obviously includes the processes of “soil degradation”. The CBD acknowledges that substantial investments are required to conserve biological diversity and that there is a broad range of environmental, economic and social benefits from those investments (see Articles 6-10). It stresses the importance of, and the need to promote, international, regional and global cooperation among countries and inter-governmental organisations and the non-governmental sector for conservation of biological diversity and the sustainable use of its components (see Article 16) and for nations to prepare strategies to implement the CBD.¹⁵⁷

For the CBD to take on an expanded, more precise role in the sustainable use of soil, substantial provisions would have to be drafted for soil and included as a protocol to the CBD. The rules should focus on the ecological functions of soil that are essential for the conservation of biodiversity and maintenance of human life.

4.1.3 Framework Convention on Climate Change

The UNFCCC acknowledges that change in the Earth’s climate and its adverse effects are a common concern for humankind. Importantly, it recognises the role of terrestrial ecosystems as a sink and reservoir for potential greenhouse gases and is concerned that human activities have been substantially increasing the atmospheric concentrations of greenhouse gases.¹⁵⁸ Two of the principal sources of greenhouse gases are changes in land use cover and land use. It has been established that soil is a major reservoir of the earth’s carbon and that the main agricultural activities that play a role in emissions of greenhouse gases and initiate or exacerbate soil degradation are deforestation, biomass burning, cultivation, using organic manure, applying nitrogenous fertilisers and livestock grazing. Excessive vegetation clearance, a principal cause of soil degradation, is one of the key concerns of the UNFCCC. The meaning of the phrase “adverse effects of climate change,” under Article 1 of the UNFCCC, has direct relevance to the activities that can cause soil degradation. These include changes in the physical environment or biota resulting from climate change, which have significant deleterious effects on the composition, resilience or productivity of natural or managed ecosystems or on the operation of socio-economic

¹⁵⁷ Miller, K.R. and S.M. Lanou, 1995, *National Biodiversity Planning, Guidelines Based on Early Experiences around the World*, the World Resources Institute and IUCN, Baltimore.

¹⁵⁸ UNEP, 1995, *United Nations Framework Convention on Climate Change*, Nairobi.

systems or on human health and welfare.¹⁵⁹ A central aspect of the UNFCCC is the responsibility of nations to protect the climate system by taking precautionary measures to anticipate, prevent or minimise the causes of climate change, and mitigate its adverse effects (Article 4). Article 4.2 is an implicit agreement for developed countries to adopt policies and legislation with the aim of returning greenhouse gas emissions to their 1990 levels. Soil degradation exacerbates the emission of gases from terrestrial and aquatic ecosystems to the atmosphere. Accelerated wind and water soil erosion, on a global scale, is the principal soil degradation process. Some 1643 million ha are affected worldwide of which 250 million are affected by strong or extreme forms of soil erosion. This is a major dilemma for the global control of soil degradation as it is the developing countries, i.e., the least capable of addressing the problem, that have the most severe soil degradation.¹⁶⁰

While the UNFCCC does provide for changes to the terrestrial environment, is not considered as the most appropriate international legal vehicle to address soil protection because it has a primary focus on making changes in the industrial sector rather than the non-industrial and agricultural land use sectors. For this reason, politically and practically, an attempt to use this instrument for the sustainable use of soil would most likely be overshadowed by the industrial interests.

4.1.3.1 Kyoto Protocol

The Kyoto Protocol under the UNFCCC was adopted in 1997.¹⁶¹ Under this Protocol it was agreed that industrialised countries would reduce their combined greenhouse gas emissions by at least 5% compared to 1990 levels, by the period 2008-2012, as a legally binding commitment. Article 2 of the Protocol promotes sustainable development and calls for each Party to implement policies and measures to protect and enhance sinks and reservoirs of greenhouse gases, taking into account their commitments under various international environmental agreements, sustainable forest management practices, afforestation and reforestation. It also contains a responsibility to promote sustainable forms of agriculture in the light of climate change characteristics. It has become clear that environmental law must play an expanded role in the preservation and rehabilitation of soil carbon sequestration sinks, and expanding existing sinks, i.e., to return the carbon to the soil and store it in long-term reservoirs. Under the circumstances, specific legal elements would need to be framed to manage soil carbon sequestration as part of the ultimate goal of sustainable use of soil.¹⁶² Details regarding the implementation of the Kyoto Protocol were subject to further rounds of negotiation in 2000 and 2001. One outcome of the 2001 round was that some countries with large-scale arable and pastoral agriculture refused to agree to a reduction in emissions through improved broadacre agricultural practices, where a significant proportion of their emissions are known to be from the agricultural land use practices. In the case of Australia, a significant proportion of the emissions are related to the on-going clearing of indigenous vegetation so that this land may be used for arable agriculture.

¹⁵⁹ Arnalds, O., A.L. Aradottir, A. Snorrason, G. Guobergsson, P. Hjalti Jonsson, and A. Agustsdottir, 1999, *Organic Carbon Sequestration by Restoration of Severely Degraded Areas in Iceland*, Preliminary Results, Agricultural Research Institute, Reykjavik.

¹⁶⁰ See op. cit. Bridges *et al.*

¹⁶¹ Climate Change Secretariat, 1997, *The Kyoto Protocol to the Convention on Climate Change*, Bonn.

¹⁶² See Hannam, I.D., 2000, *Framing Environmental Law and Policy to Manage Soil Carbon Sequestration*, 11th International Soil Conservation Organisation Conference, Buenos Aires, Argentina.

4.2 Regional Binding Instruments

A number of regional binding instruments include provisions for the sustainable use of soil. These cover the South Pacific region, Central and Northern Africa, the Alpine area of Europe, Southeast Asia, and the Mediterranean.

4.2.1 Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (SPREP)

The SPREP Convention entered into force in 1986 to protect the marine environment from pollution in the 200 nautical mile zone around a number of South Pacific States (Article 2 describes the Convention Area).¹⁶³ Under Article 2(f), “pollution” means the introduction, directly or indirectly, of substances or energy into the marine environment that results or is likely to result in harm to the living resources of this marine environment. This definition, in the context of the Convention, includes various products of land-based soil degradation. Article 2 also specifies that Parties comply with the standards established by international organisations (the South Pacific Commission). Land-based soil degradation affects the marine environment in many ways. Sediment from soil erosion in the upstream environment of coastal catchments (from agricultural land, building sites, roadworks etc) smothers marine ecosystems and carries harmful nutrients to marine biota (e.g., nitrates and phosphates from fertilisers and chemical additives to the soil for agriculture). Other forms of soil degradation that pollute the marine environment include soil acidification, and acid sulphate soil processes. Many of the Convention’s articles have a soil protection and management obligation. Under Article 5, the special agreements that are made to protect and manage the marine environment could include provisions to control and prevent land-based soil degradation activities. It is a general obligation on Parties to take appropriate measures to prevent, reduce and control pollution of the Conservation Area from any source, and to use the best practicable means at their disposal. Article 7 requires Parties to take measures to prevent, reduce and control the pollution that originates from the land-based sources and is disposed of in, or discharges from rivers or any other source in their territory. Article 23 provides for the adoption of Protocols to the Convention for the prescription of agreed measures, procedures and standards to prevent, reduce and control pollution.

4.2.2 African Convention for the Conservation of Nature and Natural Resources

This Convention, which entered into force in 1968, includes a number of provisions for the sustainable use of soils.¹⁶⁴ States must adopt the measures necessary to ensure conservation, utilisation and development of natural resources, including the “soil”.¹⁶⁵ Under Article IV, States are obligated to conserve and improve soil, combat soil erosion, and not misuse the soil. There is a further obligation under this article for States to establish land use plans based on scientific investigations, and ecological, pedological, economic, and sociological factors, and classify the land use capability. When implementing agricultural practices and agrarian reforms, States are obligated to use soil conservation measures, improved farming methods, and control soil erosion caused by various land uses that lead to loss of vegetation cover. Other articles contribute to soil

¹⁶³ Article 2 describes the Convention Area as being the States of Australia, Cook Islands, France, Marshall Islands, Micronesia, Nauru, New Zealand, Palau, Papua New Guinea, Samoa, Solomon Islands, Tuvalu, United Kingdom, United States of America, involving a total of 22 individual “convention areas”.

¹⁶⁴ There are 43 Parties to the Convention, covering the northern and central African States. South Africa is not included.

¹⁶⁵ Soil is part of the definition of natural resources under Article III.

protection by protecting flora (Article VI), maintaining and extending conservation areas (Article X), conservation education (Article XIII), and through inter-state co-operation (Article XVI).

4.2.3 Convention Establishing a Permanent Inter-State Drought Control Committee for the Sahel

This Convention entered into force in 1974, being adopted by the States of Burkina Faso, Cape Verde, Chad, Gambia, Guinea-Bissau, Mali, Mauritania, Niger, and Senegal to form a committee for inter-State drought control (Article 1). The occurrence of drought in this region is a major causal agent of soil degradation, being a poverty-stricken area where the high population maintains constant pressure on the land resource. The principal objective of the Convention (Article 3(1)) is important for the sustainable use of soil because it requires the Drought Committee to undertake research into the Sahel ecological zone to enable the preparation of more effective regional policies to manage this sensitive ecotype. Other objectives provide for collection and dissemination of ecological information to member States, coordinate research and training against aridity (Article 3(2)), promote regional and local actions to strengthen cooperation between the States (Article 3(3)), and to raise funds to finance programs aimed at improving nutritional sufficiency (Article 3(4)). Article 13 provides for the formation of a technical committee of experts to review the performance of the Management Council of the Committee (Article 4).

4.2.4 Benelux Convention on Nature Conservation and Landscape Protection

This Convention entered into force in 1983 with Belgium, Luxembourg and the Netherlands as the Parties. The Convention is relevant to the objective of sustainable use of soil because the States undertake to cooperate in the conservation, management and restoration of the natural environment (Article 1). Under Article 1(2) the “natural environment” means living and non-living elements, including biotypes and “landscapes” where the latter is that part of the earth characterised by the interaction of soil, relief, water, climate, flora, fauna, and human beings. Article 2(1)-(5) provides for the States to cooperate for consistency in policy, exchange of information, information and training, exchange of scientific results and coordinate execution of international agreements. Article 3(1)-(4) creates an obligation for the States to protect their natural zones and valuable landscapes through the preparation of management projects and work programs, and regular consultation. Although this convention has no explicit provisions for soil as such, the “cooperative” function is an essential element for its protection and management.

4.2.5 Convention for the Protection of the Mediterranean Sea Against Pollution

This Convention entered into force in 1978 to prevent, abate and combat pollution of the maritime waters of the Mediterranean Sea proper, and enhance the marine environment¹⁶⁶ (see Article 4). Article 8 obliges the Parties to take preventative action against pollution from land-based sources which, under the definition of “pollution” in Article 2(a), includes the direct or indirect introduction by humans of substances into the marine environment that harm the living resources. Under this definition, many products of soil degradation would constitute “substances” that would harm the marine environment and biota, including sediment, acid soils, and various chemicals from rural and non-rural land uses. It is viewed that, as with the SPREP Convention (above) various Articles could be used to prevent and control the land-based soil degradation activities which harm the marine environment. For example, Parties can enter into bilateral or multilateral agreements, or regional or sub-regional agreements to protect the land environment (Article 3), establish monitoring programs in cooperation with international bodies (Article 10), cooperate in scientific

¹⁶⁶ This Convention includes 20 States that border the Mediterranean Sea and includes European Communities.

and technological activities (Article 11), and adopt additional protocols concerning the prevention, abatement and combat of pollution from soil degradation processes.

4.2.6 Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean

This Protocol entered into force in 1999 and involves 16 of the 20 countries that are Party to the Convention on the Protection of the Mediterranean Sea against Pollution. It applies to the same area as in Article 1 of the Convention, and is of relevance to soils only in so far as it includes the terrestrial coastal areas designated by each of the Parties. It does not have the full land-based jurisdiction of the Convention, and its responsibility is restricted to soil protection and management in the narrow “land-based” coastal area. The application of the definition of “biological diversity” (Article 1(b)) within the objectives of this Protocol requires consideration of the soil as an essential component part of the terrestrial ecosystem. Further, through the General Obligations (Article 3), important information on soil would be obtained through the responsibility on Parties to identify and compile inventories of ecological information, adopt strategies and programs for conservation of biological diversity, monitor activities which have an adverse impact, and apply protective and conservation measures.

4.2.7 Convention Concerning the Protection of the European Alps

This Convention entered into force in 1995 with the general obligation (Article 2) for Parties to pursue a comprehensive policy to protect the European Alps by applying the principles of prevention, “polluter pays”, and the prudent and sustained use of resources. To achieve this objective, Parties have a specific obligation for soil conservation (Article 2 (d)). The objective of this article is to reduce soil damage by using agricultural and forestry methods that do not harm soil, cause minimal interference to soil, and control soil erosion. It also restricts soil-sealing practices. Additional soil protection functions of Article 2 include the requirements for regional planning (2(b)), water management (2(e)), nature conservation (2(f)), mountain farming (2(g)), and mountain forest management (2(h)). In recognising the important ecological values and needs of soil to the European Alpine area, a Protocol to the Alpine Convention for the Protection of Soils was adopted in 1998. Although it has not entered into force yet, its objectives can still be partly fulfilled under the existing Convention.

4.2.7.1 The Protocol for the Implementation of the Alpine Convention of 1991 in the Area of Soil Protection¹⁶⁷

The Alpine Convention Soil Protection Protocol (ACSPP) was adopted in October 1998.¹⁶⁸ The Protocol is a significant component of the total European Alpine protection regime.¹⁶⁹ The ACSPP is very significant to the terms of reference of this report as it is the only specific binding instrument for soil in the world, and contains many of the ecological concepts and principles advocated by this

¹⁶⁷ The following comments on this Protocol have been made on the basis of an unofficial English translation made by Ann De Voy of the IUCN ELC, for the purposes of this report.

¹⁶⁸ Signatory States include the Federal Republic of Germany, the Republic of Austria, the French Republic, the Italian Republic, the Principality of Liechtenstein, the Principality of Monaco, the Republic of Slovenia, the Swiss Confederation, and the European Community.

¹⁶⁹ Other specific protocols adopted, but not yet in force, which make up the Alpine Convention regime are for: town and country planning and sustainable development; mountain agriculture; nature protection and landscape conservation; and mountain forests.

report as being “essential” for national and international soil instruments. Of fundamental significance, the ACSPP is based on an ecosystem perspective and recognises the Alps region for its ecological diversity and highly sensitive ecological systems whose functional capacity must be preserved. The principal objective of the ACSPP is to reduce the quantitative and qualitative damage to soil through the use of appropriate agricultural and forestry land use methods that do not harm the soil. It promotes minimal interference with soil, soil erosion control, restrictions on the sealing of soil, and soil rehabilitation. The ACSPP sets out the functions of soil, including natural functions, cultural functions, and land use functions, emphasising that they be safeguarded and preserved to maintain an ecological balance in the region, and soil diversity, for future generations (Article 1). In particular, the ACSPP has a number of specific obligations for the Parties to observe in regards to:

- Legal and administrative measures to protect soil and applying the precautionary principle (Article 2);
- Consider the objectives of the ACSPP in other policies (e.g., forestry, agriculture, nature protection) (Article 3);
- Coordination and cooperation between institutions and territorial authorities to develop synergies for soil protection (Article 4);
- A commitment to support international cooperation among institutions on soil risk and soil research (Article 5);

Chapter II of the ACSPP contains many specific measures for contracting parties to adopt to: use soil sparingly and cautiously (Article 7); preserve wetlands and moorlands (Article 9); delineate areas for rehabilitation and special land management (Article 10), and areas affected by soil erosion (Article 11); protect soil for agriculture and forestry (Article 12), and against impacts of tourism (Article 14); protect soil against pollutants (Article 15); and to recognise the ecological characteristics and values of soils (Article 16). Chapter III sets out specific obligations in relation to the maintenance of ecological harmony and to preserve the environment, and to make soil information available to the public.

Many of the legal elements in the ACSPP are consistent with the legal frameworks suggested in this report for both the national and international soil legal and institutional regimes.

4.2.8 The ASEAN Agreement on the Conservation of Nature and Natural Resources

The ASEAN Agreement was adopted in 1985, but is not yet in force. The Parties include Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore and Thailand. Its fundamental principle (Article 1 (1)) is for Parties to operate within the framework of their national laws, and adopt singly, or through concerted action, the measures necessary to maintain essential ecological processes and life-support systems, and preserve genetic diversity, through the goal of sustainable development. Parties have an obligation to develop and co-ordinate national conservation strategies within the framework of a regional conservation strategy. Article 7 for “Soil” requires Parties to observe the role of soil in the functioning of natural ecosystems, undertake soil conservation measures to rehabilitate eroded and degraded soils, establish soil policies, control soil erosion and improve soil fertility. The objective for soil is enhanced through the general operations of the Agreement, specifically Chapter III that concerns the conservation of ecological processes. Article 10 provides for the Parties to maintain the proper function of ecosystems and to prevent the degradation of the environment. This obligation is supported by others in the Agreement, concerning environmental planning and assessment, and national supporting measures (Chapter V) for scientific research, education, information, and training obligations. Chapter VI includes provisions on international cooperation.

4.2.9 Agreement for the Establishment of the Arab Centre for the Studies of Dry and Barren Land

This Agreement came into force in 1971¹⁷⁰ to establish a specialist institution for the study of land utilisation aspects, particularly soil and water management, in a very important ecological region. Under Article 3, the role of the Centre includes the conduct of studies into soil and water management, preparing soil maps, studying wind and water erosion and soil salinity, and studying the deterioration of agriculture and protective crops. To achieve these objectives, the Centre undertakes training of specialists, exchange of knowledge and information, enters into cooperative programs and education activities on soils, water, forest, and crop management.

5. Other Initiatives Relevant to Soil

5.1 The Forest Principles

The UNEP 1992 Forest Principles are a non-legally binding statement for a global consensus on the management, conservation and sustainable development of forests. By applying to both natural and planted forests, in all geographic regions and climatic zones, including austral, boreal, subtemperate, temperate, subtropical and tropical, the Principles have an important role in managing and preventing soil degradation. They recognise that forests embody complex and unique ecological processes, which are the basis for their present and potential capacity to provide resources to satisfy human needs as well as environmental values. The Principles also recognise that the responsibility for forest management, conservation and sustainable development, is, in many countries, allocated among national, provincial and local levels of government. In recent years there has been a suggestion for an international forest regime, including a Convention.¹⁷¹ It is also recognised that various components of the Forest Principles could be imported into forest management strategies in the form of guidelines to manage forests, so as to give consideration to the protection and management of the soil environment. In the future negotiations that will take place in relation to a possible international legally binding instrument, this could be promoted as an important aspect.

5.2 Draft International Covenant on Environment and Development

The IUCN Draft Covenant has been prepared as an umbrella agreement to knit together the principles reflected in the sectoral treaties that impact upon the environment and development.¹⁷² The draft Covenant has many articles that are relevant to the protection and management of soil.¹⁷³

¹⁷⁰ Parties to the Agreement include 19 States from the central and northern African area.

¹⁷¹ See Tarasofsky, R.G., 1995, *The International Forests Regime – Legal and Policy Issues*, IUCN and Worldwide Fund for Nature. The final session of the Intergovernmental Forum on Forests in early 2000 recommended that an international legal framework for all types of forests be developed over the next five years; see Forum report at www.un.org/documents/erosoc/cn17/2000/ecn172000-14htm; see also “Forests” in 11 Yearbook of International Environmental Law 323-325 (2000).

¹⁷² See op. cit. IUCN Draft Covenant, 2000. This document was launched at the United Nations Congress on Public International Law held at New York on 13 March 1995. The revised text was presented to the Member States of the UN on the occasion of the closing of the UN Decade of International Law, 54th Session of the UN General Assembly, on 17 November 1999.

¹⁷³ E.g., see in particular, Parts II (Fundamental Principles), III (General Obligations) and IV (Natural Systems and Resources).

Article 18 is specifically on the subject of soil. It states that:

Parties shall take appropriate measures to ensure the conservation and where necessary the regulation of soils for all living systems by taking effective measures to prevent soil erosion, to combat desertification, to safeguard the processes of organic decomposition and to promote the continuing fertility of soils.

Moreover, the commentary on the Draft Covenant notes that elements of Article 18 can be derived from existing international instruments at the global level, but soil conservation *per se* is only addressed in regional treaties. It further notes that protection and restoration of soils is essential to many natural systems and resources, as well as to biological diversity.¹⁷⁴

5.3 A Non-Government Initiative for a Binding Instrument for Soil – The Tutzing Proposal

In response to the outcome of the conference “Time for Soil Culture – Temporal Perspectives on Sustainable Use of Soils”, held at the Tutzing Academy in Germany, in April 1997, a proposal for a “Convention on Sustainable Use of Soils” was formulated.¹⁷⁵ The principal objective of this proposal is the sustainable use of soils by all States in order to preserve soil functions. The structure of the proposed “Soil Convention” is adapted from that used in some existing United Nations natural resource conventions. Significantly, the proposed “legal articles” in the Tutzing document embody the principal ecological functions of soil for the maintenance of human life, including:

- The production of biomass;
- The filtering, buffering and transformation activity between the atmosphere, ground water and plant cover;
- Soils as a biological habitat and gene reserve;
- Soils as a spatial base for technical, industrial and socio-economics structures and their development; and
- Soils as a source of raw materials.

The Tutzing proposal has been widely disseminated in Europe, with a variety of reactions. The main outcome is that there is now a broader recognition of the benefits of having some form of global instrument for soil, as a major part of the global action needed to reduce soil degradation and to improve general environmental amenity on a global basis. The Tutzing proposal has been discussed at several international soil meetings. It was raised at the 2nd International Conference on Land Degradation in Thailand in January 1999, followed by the International Soil Conservation Organisation (ISCO) Conferences in May 1999 in the USA,¹⁷⁶ and in Argentina in October 2000, and recently at the international Soils and Food Security Conference at Tutzing in April 2001. It has also been discussed at a number of regional soil conferences, such as in Prague in August

¹⁷⁴ Op. cit. IUCN Draft Covenant, 2000, p. 65.

¹⁷⁵ See Held, M., K. Kummerer, and K. Odendahl, 1998, “Preserving Soils for Life, The Tutzing Project ‘Time Ecology’”, in *Proposal for a “Convention on Sustainable Use of Soils*, Verlag, Munich.

¹⁷⁶ See op. cit. El-Swaify.

2000.¹⁷⁷ Representatives of the Tutzing group made contact with the IUCN Environmental Law Centre in September 1999 to explain the background to their Proposal and to seek support for a convention for soil.¹⁷⁸ Subsequently, the Tutzing document, “Preserving Soils for Life, Proposed Convention on Sustainable Use of Soils”, was referred to in the initial workplan of the CEL SS WG “in respect of its suitability as a basis for an international environmental law instrument on soil”.

6. Issues Related to Responsibility and Liability under International Law

In international law, States have a general responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or to areas beyond the limits of national jurisdiction. This is embodied in, for example, Principle 21 of the *Stockholm Declaration on the Human Environment* and Principle 2 of the *Rio Declaration on Environment and Development*. With regard to soil degradation, the question is whether States may be liable for “activities” that intentionally or unintentionally cause soil degradation or the use of soil in an unsustainable manner in another State.¹⁷⁹ At present, public international law on liability is underdeveloped, both generally and on the possible liability of States for this kind of environmental damage. Such questions of liability raise complex questions for soil on how different sets of international rules fit together in current international law. However, at this point it is important to lay the foundations for a system to strengthen international responsibility for activities that cause soil degradation or the unsustainable use of soil in all countries.

7. Overview of Existing International Regime

The current international environmental law regime is inadequate to cater for the principal international environmental law needs for soil as clearly recognised in this report. The existing binding instruments are insufficient as a framework for soil as they fall well short of including anywhere near a sufficient range of legal elements that are needed to protect and manage soil in a sustainable way. Of primary concern is the failure of the existing system to properly consider the ecological functions of soil. Further, although the current international non-binding instruments for soil include some general conceptual material that is still relevant in the 21st century, they do not recognise soil as an important element of the terrestrial ecology, also falling well short of the type of environmental concepts and policy elements needed to achieve sustainable use of soil as defined in section 2. Finally, and of major concern to the mandate of the CEL SSWG is that the existing international environmental law regime does not provide for any guidance to States in relation to the reform or development of national soil legislation.

These inadequacies are particularly obvious when the current national and international situation is interpreted within the general objectives of environmental law advocated within the UNEP Montevideo Programme III – the Programme for the Development and Periodic Review of

¹⁷⁷ European Soil Bureau and Foundation Charles Leopold Mayer, 2000, *Soils in Central European Countries, New Independent States, and Central Asian Countries and in Mongolia, Present Situation and Future Prospects*.

¹⁷⁸ Present at the meeting were Dr Françoise Burhenne-Guilmin (ELC), Dr Ian Hannam (Member CEL), Dr Martin Held, Dr Kerstin Odendahl and Prof Dr Rabah Lahmar (representing the Tutzing proposal).

¹⁷⁹ See Blomquist, R., 1997, “Virtual Borders? Some Legal-Geo-Physical Musings on Three Globally Significant Fragile Ecosystems under United Nations Agenda 21”, in *Canadian State Law Review* 45:23.

Environmental Law for the First Decade of the Twenty-First-Century. In particular, the Montevideo Programme III advocates action to improve the effectiveness of environmental law in the areas of implementation, compliance and enforcement, prevention and mitigation of environmental damage, strengthening and development of international environmental law, and through innovative approaches to environmental law.¹⁸⁰ It is clear that to improve the conservation, rehabilitation and sustainable use of soils, as specified under Activity 12 of the Programme entitled “Soils”, this will require significant changes to existing legislation and the development of new legislation with the capability to meet the challenges set out in Montevideo Programme III.

8. An International Environmental Law Framework for Soil

Reference to key elements of the Montevideo Programme III provides a useful guide as to what the elements of an international framework for soil might be, in order to promote the goal of sustainable use of soil at a national level. While all of the general actions set out to address the Effectiveness of Environmental Law in section 1 of the Montevideo Programme III are relevant to soil, it is considered that the following three actions are particularly relevant to an immediate process of legislative development:

- To achieve effective implementation of, compliance with, and enforcement of environmental law by promoting the implementation of environmental law through, *inter alia*, the widest possible participation in multilateral environmental agreements and the development of relevant strategies, mechanisms and national laws.¹⁸¹
- Strengthening measures to prevent and mitigate environmental damage when it occurs.¹⁸²
- To strengthen and develop international environmental law, building on the existing foundations.¹⁸³
This element is of particular importance because it encourages international action to address gaps and weaknesses in existing international environmental law and to respond to new environmental challenges.
- To apply innovative approaches to environmental law to improve its effectiveness. This requires the identification and promotion of innovative approaches, tools and mechanisms, including the promotion of ecosystem management in law and practice, including the environmental benefits of ecosystems.¹⁸⁴

9. The Case for a Specific International Soil Instrument

The goal of intergenerational equity is considered to be the fundamental objective of sustainable use of soil. This principle recognises that the present generation has a basic obligation to conserve options for future generations by maintaining to the maximum extent possible the diversity of the resource base. The *Brundtland Report*,¹⁸⁵ in regard to non-renewable resources, pointed out that

¹⁸⁰ Montevideo Programme III notes that UNEP will take action in these areas in coordination with States (See Preamble).

¹⁸¹ Clause 1 of the “Effectiveness of Environmental Law” under the Montevideo Programme III.

¹⁸² Clause 3 of the “Effectiveness of Environmental Law” under the Montevideo Programme III.

¹⁸³ Clause 5 of the “Effectiveness of Environmental Law” under the Montevideo Programme III.

¹⁸⁴ Clause 9 of the “Effectiveness of Environmental Law” under the Montevideo Programme III.

¹⁸⁵ See *op. cit.* World Commission on Environment and Development, 1985, p. 45-46.

present generations have an obligation to consume non-renewable resources in a manner which provides future generations with an opportunity for an orderly transition to alternative methods of obtaining similar benefits. It is essential to apply this principle to formulate the elements for international soil law, a position that is supported by various Articles adopted by the *Experts Group on Environmental Law of the WCED*,¹⁸⁶ various Principles in the *Rio Declaration*, and the goals and objectives of the Montevideo Programme III for the review of environmental law over the next decade. Two Articles in particular from the *WCED* work are relevant to this objective:

- **Article 1. Fundamental Human Right (38-32)** – “All human beings have the fundamental right to an environment adequate for their health and well-being”.
- **Article 2. Conservation for Present and Future Generations (42-42)** – “States shall ensure that the environment and natural resources are conserved for the benefit of present and future generations”.

Taking the view that it is a basic right of individuals to have an ecologically healthy and sustainable soil environment, it is appropriate that the international legal regime for soil be characterised by a framework which:

- Contains the fundamental biological principles for sustainable soil management;
- Consolidates aspects of relevant elements of existing international instruments and policies, including the soil policies;
- Provides guidelines on the legal, biological and policy requirements for the ecologically sustainable management of soil;
- Forges links between a soil instrument and other international environmental instruments;
- Provides the motivation for States to legislate or reform national legislation on soil, recognising that soil is part of the biophysical environment;
- Promotes public awareness of the need for soil conservation; and
- Promotes the development of guidelines for environmental education about soil by providing for the formation of an international soil panel.¹⁸⁷

10. Options for Legal Frameworks for Soil

The two principal framework structures that an international environmental law instrument for soil may take are either a legally binding instrument, or a non-legally binding instrument.¹⁸⁸

¹⁸⁶ The World Commission on Environment and Development, 1986, *Environmental Protection and Sustainable Development; Legal Principles and Recommendations*, Experts Group on Environmental Law, Graham and Trotman/Martinus Nijhoff.

¹⁸⁷ The proposal for an Intergovernmental Panel on Land and Soil was first promoted at a side-event to the COP4 of the CCD in December 2000 at The Hague. An organisation of a type as advocated under the Intergovernmental Panel on Land and Soil proposal should be provided for in an international soil instrument.

¹⁸⁸ The following discussion is based on the terms as they appear in the UN *Treaty Reference Guide*, op. cit. United Nations, 1999.

10.1 A Binding Instrument as a Specific Framework for Soil

10.1.1 Treaty

As a generic term, “treaty” is regularly used to embrace instruments that are binding at international law, concluded between international entities, regardless of their formal designation. A treaty, in the generic sense, is also synonymous with the terms “convention”, “agreement” and “protocol”, and is:

- A binding instrument, where the contracting parties intended to create legal rights and duties.
- Concluded by States or international organisations with treaty-making power.
- Governed by international law.
- In writing.

A treaty is normally open for participation by the international community as a whole, or by a large number of States. Usually the instruments negotiated under the auspices of an international organisation are called conventions.¹⁸⁹ The structure of a treaty can range from very formal to less formal, where the latter may be in the form of an agreement that deals with a narrower range of subject matter than the former. A treaty can also take the form of an instrument of a technical or administrative character, signed by the representatives of government departments, but not subject to ratification.

Another structural form of treaty, referred to as a “protocol”, can be:

- A binding instrument that is subsidiary to an existing treaty, and drawn up by the same parties. These can deal with ancillary matters, such as the interpretation of particular clauses of the existing treaty, formal clauses not inserted in the treaty, or the regulation of technical matters,
- An instrument that establishes additional rights and obligations to an existing treaty but is independent and subject to independent ratification. They enable certain parties of the existing treaty to establish among themselves a framework of obligations that reach further than the general treaty and to which not all parties of the general treaty need to consent, creating a “two-tier system”,
- An instrument with specific substantive obligations that implements the general objectives of a previous framework or umbrella treaty. It ensures a more simplified and accelerated treaty-making process,
- An instrument, which contains supplementary provisions to a previous treaty.

10.2 Non-Binding Instrument

This form of international instrument is used where the parties concerned do not wish to create binding obligations but wish to declare certain substantive aspirations.¹⁹⁰ The terms “Declaration”

¹⁸⁹ See e.g., op. cit. *Convention on Biological Diversity, 1992* and *United Nations Convention on the Law of the Sea, 1982*.

¹⁹⁰ See e.g., op. cit. *The Rio Declaration*; this type of instrument may also advocate the establishment of an International Panel for Land and Soil as discussed above.

and “Charter” are synonymous with these forms of non-binding instruments. However, this form of non-binding instrument can be a treaty in the generic sense, with the potential or intention to make it binding as international law in the future. In their formation it is therefore necessary to establish in each individual case whether the parties intend to create binding obligations.

11. A Process

It is essential that the promotion of an international legal framework to protect the soil environment provides an opportunity for the input of all interested parties, including international environmental organisations, States, soil science institutions, private sector interests, and non-government organisations. However, a number of the “known” obstacles to the implementation of international instruments should be taken into account when deciding on a process for an international soil instrument.¹⁹¹ In general, for soil, such a process would involve (amongst other things):

- Building an adequate understanding of current soil degradation processes and issues (in particular severity and distribution), to enable a clear vision of the benefits of an international sustainable soil legal framework;
- Assembling existing policy, strategic material and legislation, which have specific or indirect references to soil conservation (e.g., biodiversity, environmental planning and natural resources legislation);
- Reviewing appropriate international instruments and strategic material, and identifying the relevant instruments that may be accommodated within the political, cultural and physical circumstances at the national level; and
- Outlining a capacity-building process, including environmental education for the international community, focusing on the most effective types of technical training for those involved in the development and implementation of State strategies for the legal protection of soil.

Further, the important scientific factors to consider in the development of an international framework would include:

- The present status of the soil resource and whether that affects the total land resource base.
- The present status of soil, where it is stable, where is it improving and where is it declining.
- The contribution of human-induced actions to the depletion of these resources and what actions can be taken to mitigate the loss.
- Whether the management of the natural resource base is succeeding or failing to control and reduce soil degradation.
- What specific soil conservation measures may have to be taken to address national and regional soil degradation problems.

¹⁹¹ See Kelly, M., 1995, “Overcoming Obstacles to the Effective Implementation of International Environmental Agreements”, in IX *The Georgetown International Environmental Law Review* 2:447; and Cameron, J., and J. Werksman and P. Roderick, 1996, Eds., *Improving Compliance with International Environmental Law*, Earthscan, London.

12. Suggested Elements for an International Framework for Soil

Prior to considering which of the above possible two frameworks may be appropriate to develop for soil, it is essential to discuss the possible elements that may be applied to achieve sustainable use of soil. The principal underlying ethic of the international framework for soil is recognising the natural aspect of soil as an ecological element, and the basic rights of humans in regard to the existence and use of soil and the obligations on respective parties to observe these natural rights. Thus, it should convey principles that allow:

- A right to an ecologically healthy soil environment.
- A right of access to judicial and administrative proceedings, including redress and remedy in exercising their rights and obligations.
- A right for a State to take legal action against another State for damage to its soil arising from the transboundary effects of unsustainable land use.
- A right for persons to participate in planning and decision-making processes for soil.
- A right of access by all people to accurate soil information, particularly knowledge of the global and regional status of soil degradation.
- A right to expect the world community as a whole, and respective States, to protect and conserve soil for the benefit of present and future generations.

12.1 Elements that Create an Obligation to Conserve Soil at the Global Level

This comprises a series of individual elements to:

- Conserve and protect soil globally.
- Develop and maintain up to date information on the global ecological status of soil.
- Establish global indicators of soil health.
- Establish and maintain soil ecological standards for the principal forms of land use which affect the soil environment.
- Monitor the general condition and health of soil and compile reports on a regular basis.
- Prepare adequate soil knowledge for the developing countries, and to give guidance on effective implementation in the developing countries.
- Outline how the soil may be adequately represented in the global environmental fora, such as the Commission on Sustainable Development.
- Forge effective links between a soil instrument and other relevant international environmental instruments.
- Outline the procedures for the global community to take action against States who use their soil in an ecologically unsustainable manner.

12.2 Elements that Create Obligations Between the Global Level and the States

These would involve a series of individual elements for the global community to assist States approach the development of:

- National environmental law frameworks for the sustainable use of soil.
- Strategies for the sharing of responsibility between government, institutions, individuals and the community, to achieve sustainable soil.
- Effective policy, guidelines and ecological standards for sustainable soil, particularly on the range of tools available to create codes, best management practice, and information on the ecological limits of soil.
- Strategies for sustainable use of soil, particularly the adoption of general objectives and principles from relevant global conventions, strategies and policies concerning ecology, the conservation of nature, and biodiversity.
- Effective community participation procedures to achieve sustainable use of soil.
- A mix of regulatory and non-regulatory means to achieve sustainable soil, including land management incentive and support programs.
- Enforcement and compliance procedures to be used where unsustainable land use practices are undertaken, including the provision to prosecute serious offences.
- Methods to conserve and manage soil on all classes of land including suitable methods to develop plans of management that are based on sustainable soil management criteria and contain sustainable soil standards and codes of practice.
- Methods to conserve and manage soil in consideration of integrated natural resource management.
- Methods to manage soil to protect biodiversity and important terrestrial ecological values.
- A geographic perspective of soil conservation, including approaches to the development of State, regional and local soil conservation plans.

Section 6

VI. Conclusions

1. General Conclusions

From the examination of the key technical and ecological issues concerning soil, the term “sustainable use of soil” was defined as “*the use of soils in a manner that preserves the balance between the processes of soil formation and soil degradation, while maintaining the ecological functions and needs of soil*”. In this context the phrase “use of soil” was taken to mean “*the role of soil in the conservation of biodiversity and the maintenance of human life*” (as taken from the Amman Resolution). This presented the dilemma for soil that, as the basic ecological component of the terrestrial ecosystem, soil is also a basic element (along with water and air) on which humans depend for the maintenance of their life and therefore put pressure on the soil. This situation is further complicated by the definitional problems associated with the term “sustainability”, and the choice of a particular mode of sustainability e.g., social, economic, or ecological, by the community. These factors influenced the manner in which this report was approached and presented.

This report indicates that the sustainable use of soil, as defined above, is inadequately catered for in national and international environmental law and suggests how this may be improved. In the 10 years since UNCED 1992 there has been an increasing realisation within the soil science community, and related groups, that a new ecologically-focused international environmental law instrument will be a critical component of the strategic plan for sustainable soil management into the 21st century. This goal is confirmed by the fact that over the last two years, no less than six international soil conferences have been held where this issue has been a major discussion item, and that it is already on the agenda of further international soils conferences to be held in the coming years. It is also appearing on the agendas of regional soil science workshops.¹⁹²

It is acknowledged that there are some good examples where individual States have undertaken soil legislation reform in a very innovative way, leading to much more effective soil legislation frameworks, e.g., Hungary, Iceland, Thailand and Australia. This is very encouraging and much has been learned, but they are few in number and many more nations would need to undertake soil legislation reform before any substantial improvement in the ecological condition of soil can be expected. Equally, at the international level, there are “pockets” of evidence of soil legal elements within the legal regime, particularly within some of the regional instruments (e.g., ASEAN Convention), but these are overshadowed by ecological priorities other than the specific ecological needs of soil. However, encouragement can be derived from the existence of the Protocol for the Implementation of the Alpine Convention of 1991 in the Area of Soil Protection, being the only single legal binding instrument for soil in the world. In this regard it provides impetus to develop effective soil instruments at the national and regional levels, including a specific international instrument.

Despite the complexities of the legal and physical aspects of the soil, there is a good range of opportunities within the scope of binding and non-binding environmental law frameworks, to develop a plan to improve the national and international legal position for soil. This report discusses various approaches and frameworks that may be taken to improve the legal mechanisms for soil at both levels.

¹⁹² E.g., Workshop on, “Soils and the Sustainable Development Strategy of the European Union”, held at the Agricultural University of Uppsala, Sweden, 23-24 April 2001.

2. Specific Conclusions

The path selected by the CEL to meet the environmental law needs of soil should be cognisant of a number of interacting factors, including:

- An awareness of the poor recognition of soil in current international environmental law, and that national soil legislation is generally inadequate to manage the type and severity of soil degradation problems experienced around the world.
- The need to consider the ecological function of soil for the conservation of biodiversity and the maintenance of human life.
- The need to satisfy the high level of recognition amongst the soil science community of the benefits of introducing an international instrument to raise the awareness of the serious situation of soil degradation, and the need to develop suitable legal tools for individual nations to use to improve the capability of their domestic law to protect and manage soil in a sustainable way. Of particular concern is the continued high rate of expansion of soil degradation globally, the increase in degree and severity of individual soil degradation processes and the periodic emergence of new forms of soil degradation. Of greatest concern is the prediction that this situation will worsen in the 21st century.¹⁹³ The data clearly shows that in the immediate future the world will be placing even greater pressure on its soils than it is today, to produce sufficient food to meet the ever-increasing food deficit.
- A general realisation that the world community must take action sooner rather than later to more adequately cater for the ecological functions and needs of soil in the international and national environmental law regimes, as an integral part of the overall framework of environmental law and policy for environmental management.¹⁹⁴
- A realisation that a number of existing multinational agreements which have specific objectives and responsibilities to improve the condition of the terrestrial environment are not being implemented to their full potential and that this situation may influence the choice of a global instrument for soil. Some developed nations with a major leadership role in global environmental management are currently displaying an unsatisfactory attitude toward some of their most important domestic responsibilities.
- In the recent past there has been some positive national soil law reforms and in a few instances new statutes have been either passed or tabled with the respective parliaments. These moves have stimulated some other nations, and some regions, to actively seek assistance to develop new national soil law, but they represent a small portion of the world in number and area.¹⁹⁵
- The decision to develop international and national soil legislation frameworks should also include the provision to develop the accompanying support materials and explanatory guidelines necessary to ensure the effective implementation of the separate frameworks.

¹⁹³ See *op. cit.*, Bridges *et al.*; and UNEP and Earthscan, 2000.

¹⁹⁴ As indicated in the Amman Resolution, the IUCN CEL Sustainable Soils Working Group mandate, and under the Soils Objective of Montevideo Programme III.

¹⁹⁵ E.g., regions that have recently shown interest include SE Asia (particularly Thailand, Vietnam, Cambodia, Lao People's Democratic Republic), Eastern and Central Europe, and the southern "cone" of South America (particularly Brazil, Argentina, Paraguay).

3. Some Options

In summary, some of the options include:

3.1 National

- Preparation of a generic “soil law”, consisting of a range of general elements which may be drawn upon by individual nations when amending an existing law or developing a new law for soil.
- Preparation of regional legal frameworks for soil, to be used in conjunction with the basic generic legal elements, which should include a range of specific elements to deal with the physical and legal characteristics of the particular region.¹⁹⁶

3.2 International

3.2.1 Binding Instrument Options:

- Specific treaty with all of the essential legal elements for soil.
- Framework treaty, which identifies the soil elements in existing treaties¹⁹⁷ and links them through a separate binding instrument. The new instrument would contain additional, specific legal rules for soil.
- Protocol to an existing treaty that creates specific rules for soil.¹⁹⁸

3.2.2 Non-Binding Options:

- An international charter for soil.
- A declaration for soil.

¹⁹⁶ See discussion above on regional instruments.

¹⁹⁷ E.g., in the *Convention to Combat Desertification*, and the *Convention on Biological Diversity*.

¹⁹⁸ Ibid.

Section 7

VII. Recommendations

To adequately fulfil the terms of the IUCN World Congress Amman Resolution of October 2000, the terms of reference of the CEL SSWG, and to accommodate the soil objectives of the Montevideo Programme III, a number of actions are called for to promote the General and Specific Conclusions of this report. Seven recommendations are made.

Seven Principal Actions Recommended

1. It is recommended that the IUCN Environmental Law Programme (ELP) host a meeting of representatives of the principal bodies who have an interest in the general objectives of the SSWG project. The objective of the meeting would be to seek their formal endorsement of the SSWG project, and to canvass opportunities for these bodies to input to the project in the interest of achieving a better overall legal strategy for the sustainable use of the world's soils. The IUCN ELP should invite representatives of the principal bodies consulted and of other suitable organisations to make substantive inputs to the project.
2. It is recommended that the ELP expand the terms of reference of the SSWG project into a more comprehensive and substantial project within the IUCN as a whole. Formal links would need to be forged with other IUCN Commissions, and with some of the specific program areas of IUCN, including links with the IUCN regions.
3. It is recommended that the ELP propose that the IUCN Council request the Director General to develop a specific soil education campaign to raise the awareness of the national and international legal needs of soil and promote the need for the community to adopt an ecologically based paradigm for soil. The ELP would be a key component of this campaign. Such an initiative would support existing initiatives of the global soil science community.¹⁹⁹
4. It is recommended that work continue on the development of the elements for a "generic" national soil statute, but to expand this task to include the development of legal frameworks and/or regional instruments for particular regions of the world.
5. It is recommended that the ELP select an appropriate option for an international instrument on the sustainable use of soils as outlined in this report and commence the development of a draft instrument, including the accompanying support and guideline materials for its effective implementation.
6. It is recommended that the ELP submit a proposal for a 2-year "sustainable soil law framework" project to potential donors, to seek financial support to further the development of legal and institutional frameworks for sustainable soils, including the "generic" soil law and the regional models.
7. It is recommended that the ELP take the appropriate steps to ensure that its initiatives for improved legal and institutional frameworks for sustainable soils is addressed at all relevant international and national conferences and meetings.

¹⁹⁹ See *op. cit.* the Global Soil Campaign of the Foundation Charles Leopold Mayer.

