DIRECTORY OF INSTITUTIONS AND RESEARCH RELATED TO THE HUMAN DIMENSIONS OF GLOBAL ENVIRONMENTAL CHANGE

IHDP SEED GRANT INITIATIVE FINAL REPORTS 1999-2000
IHDP Directory of Institutions and Research Related to the  
Human Dimensions of Global Environmental Change  
IHDP Seed Grant Initiative Final Reports, 1999-2000  
Edited by: Petra Pommerening, Ramine V. Shaw and Michael Gardner  
Bonn, Germany  
October 2001  
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IHDP Directories

In this IHDP publications series the programme documents IHDP-sponsored activities and services offered to its research community. We encourage you to provide any comments or feedback to the IHDP Secretariat. The views and opinions expressed in these publications by authors do not necessarily represent those of the IHDP, nor its sponsors, ICSU (International Council for Science) and ISSC (International Social Science Council).
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Foreword

In the second half of 1998, the IHDP began to provide small seed grants to colleagues in developing countries and countries in economic transition, to help them identify “who is doing what?” in human dimensions research in their country. In some cases the seed grants, generally on the order of US$ 2000, were used to organise a workshop, in other cases the money was used to produce an inventory. As this initiative has proceeded, we have found it most useful to have an inventory before proceeding with a workshop.

The initiative has led to the formation of some National Human Dimensions Committees. It has also provided a wealth of information about the kinds of projects being carried out in a wide range of countries, in Africa, Asia, Latin America, Central and Eastern Europe and Russia. We hope that this information will be of use to the IHDP projects, to the broader community of human dimensions scholars and to our partner global environmental change programmes.

This volume reproduces the first set of reports received as a result of the seed grant initiative. A further report is planned with further inventories. The production of this report involved a large amount of editing, for which I would like to thank Ramine Shaw, Petra Pommerening and Michael Gardner. Despite their hard work, there are some unavoidable inconsistencies in the text, due to the fact that the reports received from different countries were in different formats and different levels of detail. Indeed, as the initiative has progressed, we have learned how to ensure better consistency and this should be evident in subsequent reports of this kind.

In addition to thanking the editors, I would like to thank those who organized and produced these reports for all their hard work. Furthermore, I would like to acknowledge the support of a grant from ISSC/UNESCO, which we have used for the seed grant initiative and the support of the German Ministry for Education and Research for the IHDP Secretariat in Bonn.

Jill Jäger
Executive Director, IHDP
Bolivia

National Inventory of Research Activities

1.0 Foreword

National Inventories of research activities in Human Dimensions of Global Environmental Changes have been performed in many countries around the world, as one of the first activities to build up new research capacities in the countries to observe and understand the human dimension of global environmental changes. These inventories show which research activities have been carried out within a country that potentially relate to human dimension research.

This Report has been produced by the Bolivian Focal Point of the International Human Dimensions Programme. It has been prepared as a first step to address human dimensions of Global Environmental Changes research in Bolivia with support of the International Human Dimensions Programme (IHDP) Secretariat and the Seed Money Grant initiative. It constitutes a synopsis of research activities that have been carried out in Bolivia related to the main issues of the human dimensions of global environmental changes.

The success in producing this report has depended on the co-operation of numerous scientists who have talked about other research projects and activities they know that may be included in this national inventory. We would like to take this opportunity to express our gratitude to all institutions that have co-operated with the completion of this report.

Javier Gonzales Iwanciw
Bolivian Focal Point of the IHDP

2.0 Scope of the study

This report has been prepared in co-operation with the International Human Dimensions Programme on Global Environmental Change (IHDP) Secretariat. It provides a list of institutions and research projects that are working on issues related to the human dimensions of global environmental changes in Bolivia. Two main questions define the scope of the study:

1. Who is doing what within the country?
2. What research results are expected?

3.0 Methodology of the study

The first methodology assumption was that the majority of researchers participate in collaborative networks or know other institutions that are carrying out some specific research activity. Therefore the study has been conducted on the basis of interviews and talks with research leaders.
3.1 Getting information

To start off, the inventory team interviewed key persons and institutions to get an overview of existing research projects and networks. These key persons or institutions participate in multilateral or bilateral co-operation and/or are distinguished researchers working in HD-related fields. This process was repeated by a second round of interviews and talks, until the institutions and researchers began to talk about the same institutions that are already registered within the inventory. Also, Internet resources have been used to collect additional information about the institutions.

3.2 Completing the data

All data that have been generated by the first interview process have been completed by telephone talks and personal interviews. In some cases the study was supported with Internet resources.

3.3 Screening process

To select the relevant projects and institutions the investigator defined basic selection criteria. Projects that show relevant or potential connections with the main aspects of the four IHDP projects have been included into the inventory. The screening was done after the information had been collected.

3.4 The information fields

For the purpose of this inventory, the institutions and researchers have provided basic information regarding the institution and institutional functions and some information regarding ongoing or expected projects. The fields of information are as follows:

1) Research leader
2) Institution
3) Address
4) Type of Institution
5) Research topics and objectives
6) Ongoing projects related to the HD of GEC
7) Project scope and duration
8) Publicized studies on this matter
9) Participation in co-operation networks
10) Financial assistance

3.5 Ongoing projects related to the HD of GEC

Some of the projects have been defined within the inventory as "project". But in a number of cases a research activity does not have a specific name. In these cases we have provided a short description of the research activity.

3.6 Project scope and duration

Some of the projects are ONGOING. Projects are referred to as SHORT TERM if the activities and institutional experiences have been achieved by short-term services or project implementation.
3.7 Publications

The study aims to have a general overview of research activities and institutional capacities. Therefore, with this field, the inventory has registered publications in a general form, as follows:

(Thesis, reports, guidelines, learning materials, audiovisual, etc.)

3.8 Participation in co-operative networks

The inventory only registered co-operative networks in which several institutions take part, and excluded the relationships and co-operation agreements that one institution may have with others.

4.0. Results of the study

4.1 Institutional conditions (financial support, human resources, level of integration with co-operation networks)

Forty-six research leaders, 35 research institutions and 27 research projects have been identified within the inventory.

From the 27 research projects identified, only 10 research projects are ongoing and have programmed the final report after June 2000, while 4 additional research projects have already reported in 1999. These projects have had the support of bilateral or multilateral co-operation. The other 13 research projects are ongoing projects, carried out with resources of their own or with short-term financial support of the government, international NGOs, and, in a few cases, in bilateral or multilateral co-operation.

The inventory has identified 35 research institutions carrying out human dimensions research. More than 60% of the institutions are research institutions, 15% are governmental institutions, and 15% are institutions of civil society.

In general terms, the research leaders working in universities and research institutes have expressed concern about a lack of financial resources for research activities in the country. Only a small amount of research has been carried out in the context of bilateral and/or multilateral co-operation. But the bulk of research is conducted with the institutions’ own resources and services in response to requirements of the government.

Other results show that only very few research leaders and institutions (approx. 30%) participate in co-operative/collaborative networks, research associations or agreements at the international level. Lack of resources is coupled with this fact as well. This result may be also connected with the situation that only approx. 15% of the research leaders have achieved PhD level, which is also true for other research areas.

4.2 Research orientation

The distribution of the 35 identified projects shows the dominance of human security related projects. Projects in the areas of food security, resource use, vulnerability and environmental stress are clearly more relevant for the country. There is also some small participation of the government and NGOs.
Projects in the area of land use and cover changes are quite common, too. This is coupled with a very important forestry sector in the country (more than 50% of the national territory is covered by forests) and with the territorial ordering tasks of the government. Here, interactions between government and research institutions are stronger.

The projects in industrial transformation are very strongly related to the governmental commitments within the UNFCCC and the clean development issue. The study shows the dominance of government and private sector institutions working on these issues.

Issues related to the institutional dimensions of GEC have been tackled mostly by the NGOs, but some research institutions are beginning to work on governance, participation, municipal management and gender issues. The interactions with the government have been more intensive during the popular participation and decentralization laws consolidation process.

5.0 Systematizing the experience

5.1 The methodology

1) Information and communication gaps have influenced the quality and accuracy of the inventory. One of the initial aims was to include all ongoing HD research activities in the country into the inventory by an interview process. Researchers interviewed have to give some information about projects related to their own HD activity.

By this process, the study team found out that the interactions between researchers of different cities and institutions are very poor. Although the interviewed researchers knew about ongoing projects within the regions, they could not always provide information regarding contact persons or address.

There is not sufficient information support in the country (guides, list of institutions, etc.) to find a research institution or research leader easily. Therefore, acquiring this information was very difficult.

Alternative information sources, like Internet resources, were not very useful. Only a small number of the institutions have a website and these do not always show information about the research leaders. Moreover, most research leaders contacted only via Email did not respond to requests for information.

5.2 Expectations of the National Human Dimensions Inventory

The study has been presented to the institutions as a first step to organize the national research community on Human Dimensions of GEC in Bolivia; hence the interviewed institutions got an overview about the issues and objectives of the IHDP.

This inventory has served to expand the number of possible participants in a national committee and research network, but also to start a process of discussion of how to empower HD research in Bolivia.

The inventory shows a first approach to the priorities and gaps of the country.
6.0 Further activities and recommendations

The Inventory provides an overview of the opportunities to carry out research in Bolivia and the problems that research faces.

This year (2000), Universidad Juan Ismael Saracho, launched the first PhD programme in Bolivia to support environmental research. This will be a general impulse for environment related research in Bolivia.

Some problems may be resolved by more public awareness and political will, while others can be addressed within the research community – creating a new research culture (publication, co-operation, and participation). More interrelations with the government and the civil society are necessary.

6.1 Data Base of research activities

The inventory may be periodically updated to include further activities run by the emerging Human Dimensions National Committee and/or the Human Dimensions secretary in Bolivia.

To establish the inventory as an ongoing activity more diffusion of information and activities is necessary within the research community about the objectives and structure of the Human Dimensions Programme, so that researchers can co-operate with additional information.

Regarding the National Committee, it should integrate as far as possible persons from different cities and regions to activate research activities regionally and have more accurate information available about the interested institutions within the regions.
**Annex 1: List of Institutions and research projects**

**IT Projects**

Clean technologies and industry

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<th>Address:</th>
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<th>Research topics:</th>
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<th>Publications on this field:</th>
<th>Project duration:</th>
<th>Participation in co-operation networks:</th>
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<tbody>
<tr>
<td>1</td>
<td>Carlos Arce</td>
<td>Centro de Producción más limpia, Cámara de Industria y Comercio</td>
<td>Av. Mariscal Santa Cruz # 1392 P.O.Box 611, La Paz Tel: +591-2-374477, Fax: +591-2-362766 e-mail: <a href="mailto:cni@mail.megalink.com">cni@mail.megalink.com</a></td>
<td>Association of private enterprises</td>
<td>Clean technologies, energy efficiency</td>
<td>Clean technology implementation in mid and small enterprises</td>
<td></td>
<td>Ongoing 2000 – 2002 with support of USAID</td>
<td>EP3</td>
<td>Bilateral and multilateral co-operation, own resources</td>
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<td>2</td>
<td>Dipl.-Ing. Jorge Heyman</td>
<td>Universidad Privada Santa Cruz</td>
<td>Av. Paragua y cuarto anillo P.O.Box 2944, Santa Cruz Tel. +591-3-464000</td>
<td>Research, education</td>
<td>Clean technologies, environment quality control</td>
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<td>EP3</td>
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Climate change mitigation

3
Research leaders: Javier Hanna Figueroa
Freddy Tejada
Institution: Programa Nacional de Cambios Climáticos
Ministerio de Desarrollo Sostenible y Planificación
Address: Av. Mariscal Santa Cruz No. 1092
Tel/fax 591-2-311813
e-mail: jhanna@coord.rds.org.bo
Type of institution: Government
Research topics: GHG emissions reduction
Ongoing projects: Potential of Bolivia to mitigate climate change
Publications on this field: Vulnerabilidad y Adaptación de los Ecosistemas al Posible Cambio Climático y Análisis de Mitigación de Gases de Efecto Invernadero, MDSMA – US EPA, 1998
Análisis de opciones de mitigación de emisiones de gases de efecto invernadero, MDSP, 2000
Project duration: Ongoing
February 2001 Report World Bank
Participation in co-operation networks: IPCC
Financial Assistance: Bilateral and multilateral co-operation

Energy applied technologies

4
Research leader: Andres Trepp
Institution: Academia Nacional de Ciencias
Address: Av. 16 de Julio No.1732
P.O. Box 5829
Tel. +591-2-310018 / 363990
Fax: +591-2-379681
Email: ancb@ancb.bo
Type of institution: Research
Research topics: Alternative energy sources
Ongoing projects: Reports
Project duration: Ongoing
Participation in co-operation networks:
Financial Assistance: Bilateral and multilateral co-operation
Incentives and legislation

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| Address               | Calle 14 de Septiembre Nº 4807, Obrajes  
Tel: +591-2-786719/786729/782967  
Fax: +591-2-786729 |
| Type of institution   | Research, education |
| Research topics       | Environmental economics |
| Ongoing projects      | Climate change mitigation costs |
| Publications on this field: |                  |
| Project duration      | Ongoing           |
| Participation in co-operation networks: |         |
| Financial Assistance  | USA, multilateral |

LUCC Projects

Natural resources monitoring and land use changes

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<tr>
<td>Institution</td>
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| Address               | Reyes Ortis No.41  
P.O.Box 14248  
Email: abtema@coord.rds.org.bo |
| Type of institution   | Research          |
| Research topics       | Remote sensing, desertification, land use, environmental impact |
| Ongoing projects      | Biomass determination in grasslands in the north and central highlands, with radar data, Cornell University (USA) European Space Agency (ESA).  
Habitat of lechmaniasis diseases in Beni, Instituto Boliviano de |
<p>| Project duration      |                    |
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<tr>
<td>Address:</td>
<td>Cota Cota c. 27 Campus Universitario Tel.: +591-2-792582 Fax: +591-2-792416 Email: <a href="mailto:insteco@coord.rds.org.bo">insteco@coord.rds.org.bo</a></td>
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<td>Avenida Petrolera Km 4,5 P.O.Box 5695,Cochabamba Telf.:+591-4-251405, Fax:+591-4-251405 Email: <a href="mailto:cistel@pino.cbb.entelnet.bo">cistel@pino.cbb.entelnet.bo</a></td>
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<tr>
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<td>Centro de Levantamientos Aeroespaciales (CLAS) Universidad Mayor de San Simón</td>
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<td>Edificio Multiacademico 2do piso. UMSS Casilla 5294 Cochabamba Tel/Fax +591 - 42-56551 E-mail: <a href="mailto:clas.itc@umss.edu.bo">clas.itc@umss.edu.bo</a></td>
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### Vegetation, forest and ecosystems

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<td>Museo de Historia Natural Noel Kempf Mercado</td>
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<td>The effect of climate change on natural forest fragments and the savannah-forest ecotones in a region where the Amazon forest borders deciduous dry forest and cerrado savannas.</td>
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<td>Herbario Nacional de Bolivia</td>
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13  
Research leaders: Luis Castello  
Guisela Ulloa  
Institution: Proyecto Plan de Acción Forestal Bolivia  
Address: Quintín Barrio No. 791 (Sopocachi)  
P.O.Box 11880  
Tel.: +591-2-418956/418971/418995  
Fax: +591-2-410518  
Email: FAO-BOL@field.fao.org  
Type of institution: Government  
Research topics: Forest management  
Ongoing projects: National Forestry Plan  
Publications on this field:  
Project duration: Ongoing  
Participation in co-        |                                              |
| operation networks:        |                                              |
| Financial Assistance:      | FAO                                          |

14  
Research leaders: Robert P. Langstroth  
Institution: Centro virtual para la investigación y el desarrollo de los llanos de moxos  
Address: moxos@concentric.net  
Type of institution: Research  
Research topics: Development  
Ongoing projects:  
Publications on this field: PhD thesis, Forest islands in an amazonian savannah of northeastern Bolivia  
Project duration:  
Participation in co-        |                                              |
| operation networks:        |                                              |
| Financial Assistance:      | USA                                          |

15  
Research leader: Dr. David Cruz Choque  
Institution: Programa Nacional de Cambios Climáticos  
Address: Av. Mariscal Santa Cruz No. 1092  
Tel/fax 591-2-311813  
e-mail: dcruz@coord.rds.org.bo  
Type of institution: Government  
Research topics: Mitigation of climate change
<table>
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<th>Human settlements</th>
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<tbody>
<tr>
<td><strong>Research leader:</strong></td>
</tr>
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<td><strong>Institution:</strong></td>
</tr>
</tbody>
</table>
| **Address:** | C. Ingavi E-689  
P.O.Box 51 Tarija  
Telf. +591-6-636778  
Email: postgrado@mail.uajms.edu.bo |
| **Type of institution:** | Research, education |
| **Research topics:** | Human Geography, Human Settlements |
| **Ongoing projects:** | PhD Programme on Environment (education, regional planning)  
Human settlements, regional planning |
| **Project duration:** | Ongoing |
| **Participation in co-operation networks:** | |
| **Financial Assistance:** | Spain |

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| **Institution:** | Universidad Mayor de San Andrés  
Instituto de Investigaciones Geográficas |
| **Address:** | Ed. Hoy Av. 6 de agosto |
| **Type of institution:** | Research, education |
| **Research topics:** | Human geography, migration, indicators |
| **Ongoing projects:** | Human settlements |
| **Project duration:** | Ongoing |
| **Participation in co-operation networks:** | |
| **Financial Assistance:** | UK, searching for assistance |
### GECHS Projects

Foodsecurity, resource use, rural development

<table>
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<th>Javier Gonzales Iwanciw</th>
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<tr>
<td>Institution</td>
<td>Associate researcher, Universidad Nur</td>
</tr>
<tr>
<td>Address</td>
<td>Hugo Dávila 899 P.O. Box 6389 La Paz Telf. +591-2-731511 Email: <a href="mailto:fmendez@latinwide.com">fmendez@latinwide.com</a></td>
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<th>Rene Chipana Luis Goitia</th>
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</tr>
<tr>
<td>Address</td>
<td>Héroes del Acre 1850, La Paz Telf./Fax: +591-2-311795</td>
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<table>
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</tr>
<tr>
<td>Address</td>
<td>Edificio Multiacademico Casilla 5294 Cochabamba</td>
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**21**

Research leaders: Gregorio Serro Grande  
Institution: Facultad de Agronomía, Universidad Gabriel Rene Moreno  
Address:  
Type of institution: Research, education  
Research topics: Sustainable Forestry  
Ongoing projects:  
Publications on this field:  
Project duration: Ongoing  
Participation in co-operation networks:  
Financial Assistance:  

**22**

Research leaders: Armelinda Zonta  
Institution: Facultad de Agronomía, Universidad Técnica del Beni  
Address:  
Type of institution: Research, education  
Research topics: Sustainable Forestry, Indigenous People  
Ongoing projects:  
Publications on this field:  
Project duration:  
Participation in co-operation networks:  
Financial Assistance:  

**23**

Research leaders: Jorge Albarracin  
Institution: Centro de Investigaciones para el Desarrollo  
Address: Av. Hernando siles 4565  
La Paz – Bolivia  
Telf.: +591-2-786169 / 784207 / 782361 / 784370 / 785071  
Fax: +591-2-786169  
Email: cides@caoba.entelnet.bo  
cides@correo.umsanet.edu.bo  
Type of institution: Research, education  
Research topics: Agroecology  
Ongoing projects: Agroecology in the tropical region of La Paz  
Publications on this field:  
Project duration: Ongoing
### IHDP Seed Grant Initiative Final Reports 1999-2000

<table>
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<tr>
<th>Participation in co-operation networks:</th>
<th>Own resources</th>
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#### 24

**Research leaders:** Lawrence Maurice  
**Institution:** Institut de recherche pour le développement [IRD]  
**Address:** P.O.Box 9214, La Paz - Bolivia  
  lmaurice@mail.megalink.com  
**Type of institution:** Research  
**Research topics:** Water resources  
**Ongoing projects:** Contamination in Amazonian rivers  
**Project duration:** 2002  
**Participation in co-operation networks:** IRD  
**Financial Assistance:** IRD

#### 25

**Research leaders:** Ruben Marin  
**Institution:** Instituto de Ecología  
  Universidad Mayor de San Andrés  
**Address:** Campus Universitario c. 27 Cota Cota  
  P.O.Box 10077, La Paz - Bolivia  
  Telf. +591-2-792582  
  Fax: +591-2-792416  
  Email: insteco@coord.rds.org.bo  
**Type of institution:** Research, education  
**Research topics:** Water resources, water biology  
**Ongoing projects:** Biohydrology of Amazonian rivers  
**Project duration:** 2002  
**Participation in co-operation networks:**  
**Financial Assistance:** France, Germany, own resources

#### 26

**Research leaders:** Guillermina Miranda  
**Institution:** Instituto de Ecología  
  Universidad Mayor de San Andrés  
**Address:** Campus Universitario c. 27 Cota Cota  
  P.O.Box 10077, La Paz – Bolivia  
  Telf. +591-2-792582  
  Fax: +591-2-792416  
  Email: insteco@coord.rds.org.bo  
**Type of institution:** Research, education  
**Research topics:** Ecosystems  
**Ongoing projects:** Climate change vulnerability of ecosystems  
**Project duration:**  
**Participation in co-operation networks:**  
**Financial Assistance:**  
**Publications on this field:**
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27

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<td>Campus Universitario c. 30 Cota Cota s/n P.O.Box 699, La Paz - Bolivia Telf. +591-2-795724 Fax: +591-2-795725 Email: <a href="mailto:ihh@mail.megalink.com">ihh@mail.megalink.com</a></td>
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Diseases

28

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<tr>
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<th>Dr. Roberth Backer</th>
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<tr>
<td>Address:</td>
<td>Av. Cristo Redentor # 100 P.O.Box 3273, Santa Cruz – Bolivia Telf.: +591-3-363939 Fax: +591-3-331850 Email: <a href="mailto:rbacker@nur.edu">rbacker@nur.edu</a></td>
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<td>Type of institution:</td>
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<td>Research topics:</td>
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29

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<th>Research leaders:</th>
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| Address: | Av. Mariscal Santa Cruz No. 1092  
|         | La Paz – Bolivia  
|         | Telf/fax 591-2-311813  
|         | e-mail: dcruz@coord.rds.org.bo |
| Type of institution: | government |
| Research topics: | Climate change and human health |
| Ongoing projects: | Climate change sensitivity analysis of Tuberculosis and Malaria |
| Publications on this field: |  |
| Project duration: | Ongoing |
| Participation in co-operation networks: |  |
| Financial Assistance: | PNUD |

**Environmental conflicts**

| Research leaders: | Jenny Gruenberger |
| Institution: | Foro Boliviano para el Medio Ambiente |
| Address: | Av. Ecuador No 2139  
|         | P.O.Box 5540, La Paz – Bolivia  
|         | Telf.: +591-2-422104/421235  
|         | Fax: +591-2-422105  
|         | Email: fobomade@mail.megalink.com |
| Type of institution: | NGO |
| Research topics: | Environmental conflicts |
| Ongoing projects: | Environmental and social impacts of infrastructure projects |
| Publications on this field: | Reports |
| Project duration: | Ongoing |
| Participation in co-operation networks: |  |
| Financial Assistance: |  |

**IDGEC Projects**

**Governance**

| Research leaders: | Jose Blanes,  
|                   | Ernesto Yánez,  
|                   | Mario Galindo,  
|                   | Rene Antonio Mayorga,  
|                   | Susana Donoso |
| Institution: | Centro Boliviano de Estudios Multidisciplinarios (CEBEM) |
| Address: | Av. Ecuador # 2330  
|         | P.O.Box 9205, La Paz – Bolivia  
|         | Telf. +591-2- 415324  
|         | Fax: +591-2- 414726  
<p>|         | E-mail: <a href="mailto:selva@cebem.com">selva@cebem.com</a> |
| Type of institution: | Research |</p>
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<td>Participation in cooperation networks:</td>
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### Gender

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<tr>
<th>Research leaders:</th>
<th>Ivvone Farah, Cecilia Salazar</th>
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Participation in cooperation networks: FLACSO
Financial Assistance: Bilateral, own resources

Education

34
Research leaders: Fabiana Mendez
Wolfgang Riess
Institution: PROCAVI
Address: Francisco Bedregal 2921
La Paz – Bolivia
Telf.: +591-2-419462
Fax: +591-2-415406
Email: procavi@mail.megalink.com
Type of institution: NGO
Research topics: Environmental Education
Ongoing projects: national parks, urban education, fuel industry
Publications on this field: Reports
Project duration: Short term
Participation in cooperation networks: PROCOSI
Financial Assistance: Own resources

35
Research leaders: Verónica López
Institution: Liga de Defensa del Medio Ambiente (LIDEMA)
Address: Av. Ecuador No 2139
P.O.Box 5540
Telf.: +591-2-422104/421235
Fax: +591-2-422105
Email: fobomade@mail.megalink.com
Type of institution: NGO
Research topics: Environmental education, institutions
Ongoing projects: National Plan Climate Change Education
Publications on this field: Reports
Project duration: Ongoing
Participation in cooperation networks: FOBONADE
Financial Assistance: PNUD, McArthur Fund, World Bank

Annex 2: Web sites and Networks

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<td>RCPLA</td>
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<td><a href="http://www.redboliviana.com">www.redboliviana.com</a></td>
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Bulgaria

Capacity Building for Bulgarian Human Dimension Programme

Prof. Dr. Todor Hristov
Secretary of National Co-ordination Center for global Change
President of NCCGC: Acad. D. Mishev
Secretary of NCCGC: Prof. T. Hristov
September 2000
Sofia, Bulgaria

1.0 Introduction

The Project “Capacity Building for Bulgarian Human Dimension Programme” was implemented in the framework of the National Co-ordination Center for global Change at the Bulgarian Academy of Sciences (NCCGC-BAS) and at the personal responsibility of Prof. PhD Eng. Todor Hristov, secretary of NCCGC-BAS.

NCCGC-BAS was created in 1997. The main goal of the Center is to unify the forces of all governmental and non-governmental organisations as well as scientists and specialists that are working or have been interested in the area of the global change and its impact on nature and society, and to improve the effectiveness of their activity, realising contacts with international organisations and assuring participation in international projects in the area of global change and its consequences.

2.0 Financial support

The implementation of the Project was possible due to the financial support of the Secretariat of IHDP.

3.0 Contact person

Prof. Dr. Todor Hristov,
National Co-ordination Center for global Change, Bulgarian Academy of Sciences
“Acad. G. Bonchev” Str., Bl. 1, Sofia 1113, Bulgaria
Tel. +359 /2/ 971 45 21, +359 /2/ 979 24 38; Fax +359 /2/ 737 995,
Email: hristov@bgcict.acad.bg

4.0 Purpose

Bulgaria is an Eastern European country moving from a central to a free market economy. Future national development depends to a considerable degree on human responses to local and regional change. The creation of a National HD Committee and development a National HDP will produce new knowledge and priorities for improving policy and action at all levels of discussion-making, by promoting, supporting and co-ordinating scientific research, research capacity-building, and international scientific networks.

The objectives of NCCGC’s activities since its creation in 1997 largely coincide with the topics of the IHDP:
5.0 Project objectives

- Creation of new research networks
- Creation of National HD Committee in the framework of the National Coordination Center for global Change at the Bulgarian Academy of Science
- Drafting a National Human Dimension Programme
- Convening of a National workshop “Capacity Building for Bulgarian Human Dimension Programme” with international participation.
- Specific national human dimensions research initiatives
- National inventory of the institutes, organisations, specialists and scientists working on the problems of HD/GEC;
- National inventory of research activities related to HD/GEC research
- Participation of representatives from Macedonia, Greece, Turkey and Romania in the National workshop “Capacity Building for Bulgarian Human Dimension Programme”. The human dimensions of global change cannot be understood without knowing what is happening in the neighbouring countries.

6.0 Project Implementation

6.1. First stage of implementation

The first stage of implementation envisaged a national inventory of the institutes and organisations as well as of researchers working in the field of HD/GEC and of the relevant research activities.

For this purpose an inquiry and an invitation were sent by Email to specialists, scientists, institutes and organisations (128 in total) to prepare information on their research topics related to HD/GEC and to annotate their works and papers related to the HD/GEC. Eighty-six answers were received.

At the same time the specialists and organisations that already responded were inscribed as members of NCCGC (Appendix 1).

On the base of the answers 4 collections were made up: Inventory of the institutes working in the area of the HD/GEC (Appendix 2).

Inventory of the specialists and the scientists working in the area of the HD/GEC (Appendix 3).

Inventory of the projects related to HD and GEC (Appendix 4).

Annotated bibliography of HD/GEC which shows “who is doing what” research (Appendix 5).

6.2. Second stage of implementation

The second stage of implementation of the Project was the organisation of a National workshop: “Capacity Building for Bulgarian Human Dimension Programme”. An Organising Committee of the workshop was elected:

- acad. Dimitar Mishev - President of NCCGC
- Prof. Todor Hristov - secretary of NCCGC
- Prof. Marieta Staneva - Pennsylvania State University
- Assoc. Prof. Galia Bardarska - representative of global Water Partnership
- Assoc. Prof. Vania Ioncheva - Institute of Water Problems
- Margarita Siarova - secretary of the Scientific Technical Union of Water Affairs in BG.
The preliminary work included:

- Invitation to the specialists and scientists to apply proposals for participation in the workshop;
- Invitation to representatives of IHDP Secretariat and the NHD Committees of Greece and Romania to participate in the workshop;
- Invitation of speakers;
- Selection of the participants from the applied proposals.
- Invitations to all the personal and collective members of the NCCGC, who were asked to submit proposals for participation in the workshop. In practice all presented applications were adopted.
- Ramine Shaw accepted to participate in the workshop as a representative of the IHDP Secretariat. Agreement for participation in the workshop was received from Prof. Dr. Michael Decleris¹, President of the Hellenic Committee of the NHDP, and from Prof. Dr. Dan Balteanu², President of Romanian NHDP Committee.
- Prof. C. G. Knight, Ms. Ramine Shaw, Prof. T. Hristov and Ass. Prof. D. Zlatunova agreed to be speakers.

Workshop “Capacity Building for the Bulgarian Human Dimension Programme”

The workshop “Capacity Building for Bulgarian Human Dimension Programme" took place in Sofia from 02.06.2000 to 03.06.2000 (Programme of the workshop - Appendix 6). The lists of the participants and speakers are given in Appendix 7.

All participants received the next workshop materials:

- Diskette containing the files:
  - Bibla.doc Books and papers in the library of NCCGC
  - Biblb.doc Journals, Bulletins, proceedings in the library of NCCGC
  - Biblc.doc Documents and reference materials in the library of NCCGC

¹ Michael Decleris studied law and social sciences at the Universities of Athens, London and Yale in USA. He is a graduate fellow of the Yale Law School (L.L.M., J.S.D.). He has been a Member of the Council of State for 41 years, of which the last ten years he served as Vice-President and President of Section V of this Court having jurisdiction on matters of environment and sustainable development. For many years he studied the science of large-scale systems and taught in educational institutes at the highest level both in Greece and abroad. He founded the Greek Systems Group and the European Systems Association headquartered in Paris. He is Professor of Public Policy at the National Center of Public Administration. He also teaches environmental systems at the Polytechnic College of the Democritean University of Thrace. He has represented the State in important missions in connection with Cyprus, the Rio International Conference on the environment and in the European Community (protection of personal data, Schengen Convention). He has written books and articles, including: The Process of Reaction to Crisis Situations, Development and Compulsion in the Modern State, Systems Theory, Systems Administration, Handbook of Systems Science, Towards Expert Government etc.

² Dan Balteanu
  - President of GEC Programme in Romania
  - Member of IHDP Committee
  - Director of the Institute of Geography at the Romanian Academy of Sciences
  - Member of the Romanian Academy of Sciences
  - Professor in the University of Targoviste, Environmental Change, Physical Geography of Romania
  - Research stages: Germany, USA (Fulbright), Sweden, Poland
The workshop was opened by the President of the NCCGC and the representative of the IHDP Secretariat. Prof. G. Knight gave an overview of the scientific studies area of HD/GEC (Appendix 8).

Ramine Shaw from the IHDP Secretariat presented an outline of IHDP (Appendix 9).

An overview of the Bulgarian research activities in the area of HD/GEC was outlined by Prof. T. Hristov (Appendix 10).

Prof. Dr. Michael Decleris from Greece and Prof. Dan Balteanu from Romania gave an overview of HD/GEC research activities in Greece and Romania, the Balkan priorities and opportunities to co-operate with Bulgarian HD/GEC Committee.

Prof. Dr. Dan Balteanu from Romania stressed the following priorities:

- industrial catastrophes and their influence on the environment in Romania and Bulgaria and the Balkan Peninsula in general;
- the manner of land use in our countries;
- the common problems connected with downstream of the Danube River and the delta of the Danube River.

He said that these problems concern both Bulgaria and Romania and are about to be solved by co-ordination researches. He pointed out that the process of soil dry, the sediment processes related to the torrential floods and landslides were the main risks for the environment in Romania.

Prof. Dr. Michael Decleris from Greece in his speech talked about the two main features - integrated development and sustainable development - in his speech. According to him, the basis of sustainable development according him is systems theory. In Greece non-governmental organisations are developing strategies for advice and consultations. He pointed out that solving ecological problems could be achieved only by means of seminars and workshops, but required the development of manners of humans behaviour and reaching new knowledge about the environment. According to Prof. Decleris, Scandinavia is a model of ecological countries for which the main priorities are:

- stressing sustainable development of society;
- a high level of economical development;
- development of strategy plans for preserving the environment;
- methods for taking decisions in the governmental and private sectors.
He also said that a national committee had to be established to gather and disseminate information and knowledge. Solving these problems requires political support and the combined efforts of the southeast European countries.

The afternoon session was dedicated to the National priorities in HD/GEC research and the discussion of the National HDP. Daniela Zlatunova demonstrated the basic HD/GEC national priorities in the HD/GEC research problems. The participants were organised in two groups and a wide discussion on the priorities in the National HDP took place. The discussions in the two groups were led by PhD. D. Zlatunova and Assoc. Prof. PhD. V. Iontcheva.

During the feedback from the breakout groups a commission compiled a draft of a National HDP and after discussion it was adopted as an official NHDP of the National Co-ordination Center for global Change (Appendix 11).

The president of the NCCGC acad. D. Mishev proposed a list of the HDP Committee for implementation of the Programme. After discussion nine members of the Committee were elected (Appendix 11).

7.0 General Conclusions from this activity

It is obvious that the scientific community in Bulgaria is closely involved in world-wide efforts to investigate processes affecting the environmental status of our planet. Although the NCCGC was founded not too long ago, it can be said that it has successfully contributed to combining efforts of various institutions, scientists and experts working and interested in the field of Human Dimensions and global Change, and has supported the improvement of effectiveness of their efforts by making contacts with international organisations and participating in international projects.

8.0 Follow-up activities

• to unify the forces of all of the governmental and non governmental organisations, as well as scientists and specialists who have been working or have been interested in the area of the global change and its impact on nature and society;
• to improve the effectiveness of their activity, realising contacts with international organisations and serving as a linkage between national and international research;
• to stimulate national research;
• To work for the emergence of the core themes (key human dimension areas within the country);
• to advise the research board for Environment and Development;
• to identify the Projects in the domain of HD of global Environmental Change.

9.0 Identification of next steps

The next steps are:

• to provide funding for the creation of a GIS information system for GC and HD on Bulgarian territory;
• to connect and verify the HD/GEC Bulgarian data with the data from Greece, Romania, Macedonia and Turkey.
Appendix 1

“Capacity Building for Bulgarian Human Dimension Programme”

List of the specialists - members of NCCGC

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### List of the institutions - members of NCCGC

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Appendix 2

“Capacity Building for Bulgarian Human Dimension Programme”

Inventory of the organisations working in the area of HD/GEC

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<th>No</th>
<th>Institute, Organisation</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agency for Economic analysis and forecasting</td>
<td><a href="mailto:Aecd@ttm.bg">Aecd@ttm.bg</a></td>
</tr>
<tr>
<td>2</td>
<td>Center for Science Studies and History of Science - BAS.</td>
<td><a href="mailto:ksimeonova@sofianet.net">ksimeonova@sofianet.net</a></td>
</tr>
<tr>
<td>3</td>
<td>Central Laboratory of General Ecology</td>
<td><a href="mailto:ecolab@ecolab.bas.bg">ecolab@ecolab.bas.bg</a></td>
</tr>
<tr>
<td>4</td>
<td>Central Laboratory of Solar and Terrestrial Impacts</td>
<td><a href="mailto:Mishev@vmsys.stil.acad.bg">Mishev@vmsys.stil.acad.bg</a></td>
</tr>
<tr>
<td>5</td>
<td>Department of Environmental Engineering, University of Rousse</td>
<td><a href="mailto:rdk@elits.rousse.bg">rdk@elits.rousse.bg</a></td>
</tr>
<tr>
<td>6</td>
<td>Department of Medical Genetics, Medical University Sofia</td>
<td><a href="mailto:draga@sofiaonline.com">draga@sofiaonline.com</a></td>
</tr>
<tr>
<td>7</td>
<td>Department of Toxicology-National Center of Hygiene Medical Ecology</td>
<td><a href="mailto:T.popov@nch.aster.net">T.popov@nch.aster.net</a></td>
</tr>
<tr>
<td>8</td>
<td>Energoproect company</td>
<td><a href="mailto:nhv@enpro.bg">nhv@enpro.bg</a></td>
</tr>
<tr>
<td>9</td>
<td>Forest Research Institute, Bulgarian Academy of Sciences</td>
<td><a href="mailto:ivanraev@usa.net">ivanraev@usa.net</a></td>
</tr>
<tr>
<td>10</td>
<td>Institute of Demography, Bulgarian Academy of Sciences</td>
<td><a href="mailto:Idemo@idemo.bas.bg">Idemo@idemo.bas.bg</a></td>
</tr>
<tr>
<td>11</td>
<td>Institute of Economics, Bulgarian Academy of Sciences</td>
<td><a href="mailto:ineo@bgearn.acad.bg">ineo@bgearn.acad.bg</a></td>
</tr>
<tr>
<td>12</td>
<td>Institute of Fishing Resources - Varna</td>
<td><a href="mailto:ifr@abcis.bg">ifr@abcis.bg</a>; <a href="mailto:ifishres@varna.ttm.bg">ifishres@varna.ttm.bg</a></td>
</tr>
<tr>
<td>13</td>
<td>Institute of Geography</td>
<td><a href="mailto:geograph@bas.bg">geograph@bas.bg</a></td>
</tr>
<tr>
<td>14</td>
<td>Institute of Psychology, Bulgarian Academy of Sciences</td>
<td><a href="mailto:Vesi@ipsyh.bas.bg">Vesi@ipsyh.bas.bg</a></td>
</tr>
<tr>
<td>15</td>
<td>Institute of Water Problems, Bulgarian Academy of Sciences</td>
<td><a href="mailto:Santur@bgcict.acad.bg">Santur@bgcict.acad.bg</a></td>
</tr>
<tr>
<td>16</td>
<td>Institute of Zoology, Bulgarian Academy of Sciences</td>
<td><a href="mailto:Zoology@bgcict.acad.bg">Zoology@bgcict.acad.bg</a></td>
</tr>
<tr>
<td>17</td>
<td>N. Poushkarov Research Institute for Soil Science and Agroecology</td>
<td><a href="mailto:svetrou@yahoo.com">svetrou@yahoo.com</a></td>
</tr>
<tr>
<td>18</td>
<td>National Institute of Meteorology and Hydrology, Bulgarian Academy of Sciences</td>
<td><a href="mailto:KonstantinTzankov@meteo.bg">KonstantinTzankov@meteo.bg</a></td>
</tr>
<tr>
<td>19</td>
<td>National Statistical Institute of Bulgaria</td>
<td><a href="mailto:AHadjiiski@nsi.bg">AHadjiiski@nsi.bg</a></td>
</tr>
<tr>
<td>20</td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE)</td>
<td><a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a></td>
</tr>
<tr>
<td>21</td>
<td>Union of Park &amp; Landscape Specialists in Bulgaria</td>
<td><a href="mailto:radovano@sf.icn.bg">radovano@sf.icn.bg</a></td>
</tr>
<tr>
<td>22</td>
<td>University of National and World Economics</td>
<td><a href="mailto:RESEARCH@UNWE.ACAD.BG">RESEARCH@UNWE.ACAD.BG</a></td>
</tr>
</tbody>
</table>
Agency for Economic Analysis and Forecasting

1. **Address for correspondence**: 31, Aksakov St., 1000 Sofia, Bulgaria
   Tel.: +359 /2/ 980 24 74, 980 24 74; Fax: +359 /2/ 981 33 58; Email: aecd@ttm.bg
2. **Director**: Mariella Nenova
3. **Contact person**: V. Voikov; Tel.: +359 /2/ 981 65 97; Fax: +359 /2/ 981 33 58; Email: aecd@ttm.bg
4. **Staff**: persons (professors, senior researchers, specialists).
5. **Scientists, working in the area related to the global change** (including young scientists)
   Name and Family, rank, Scientific Degree, speciality, age
7. **Domains of research activity**: Monitoring and analysis of the processes of economic and financial stabilisation, working out macroeconomic forecasts, strategies and national programmes. Evaluation of the degree of co-ordination between the proposed macroeconomic policy measures implemented in different spheres and carries out economic analyses and forecasts of the medium- and long-term trends in economic development. Elaboration and motivation economic reform scenarios and structural adjustment variants and consults the Government on the adoption of economic decisions and their impact on the overall equilibrium and growth of the national economy. Observation the performance of the economic programmes of the country, as well as elaboration and suggestions alternative variants for carrying out macroeconomic policies which guarantee the achievement of their underlying policy targets. Organisation of qualification courses for civil servants, seminars and conferences on general and specific issues of macroeconomic policy and financial stabilisation.
8. **Financial and other possibilities** of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change.

Center for Science Studies and History of Science, Bulgarian Academy of Sciences

1. **Address for correspondence**: 4, Serdika St., Sofia, Bulgaria
   Tel.: +359 /2/ 883 887 Fax: +359 /2/ 980 47 57 Email: ksimeonova@sofianet.net
2. **Director**: Prof. DSc Kostadinka Simeonova
3. **Contact person**: Prof. DSc Kostadinka Simeonova
   Tel.: +359 /2/ 883 887 Fax: +359 /2/ 980 47 57 Email: ksimeonova@sofianet.net
4. **Staff**: 24 persons (2 professors, 9 senior researchers, 3 specialists).
5. **Scientists, working in the area related to the global change** (including young scientists)
   Kostadinka Simeonova, Prof. D.Sc.
   Iskra Arsenova, senior researcher, PhD
   Sergej Rozhkov, senior researcher, PhD
   Georgi Angelov, senior researcher, PhD
   Ludmila Ivancheva, researcher, PhD
   Philip Philipov, PhD Student
6. **Research departments**: Science policy, Potential of science, Scientometrics
7. **Domains of research activity**:
   scientific potential – staff, information, equipment
   scientometric analyses – publication activity, citations, cognitive structure of science
   science policy, development of science
8. **Financial and other possibilities** of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change:
Central Laboratory of General Ecology, Bulgarian Academy of Sciences

1. **Address for correspondence**: 2, Gagarin St., Sofia, Bulgaria  
   Tel.: +359 /2/ 717 195   Fax: Email: ecolab@ecolab.bas.bg  
2. **Director**: Assoc. Prof. Nesho Chipev, PhD  
3. **Contact person**: Assoc. Prof. Nesho Chipev, Ph.D  
   Tel.: +359 /2/ 717 195   Fax: Email: ecolab@ecolab.bas.bg  
4. **Staff**: 50 (Professors-1, senior researchers-10, specialists-14)  
5. **Scientists, working in the area related to the global change** (including young scientists)  
   Georgi Hiebaum PhD, Assoc. Professor, chemist, 58  
   Jordan Usunov PhD, Assoc. Professor, biologist, 50  
   Svetla Bratanova PhD, Research Assoc., biologist, 46  
6. **Research departments**: Biological Diversity, Bioindication and Ecological Risk, Functional Ecology  
7. **Domains of research activity**: Biodiversity and its functional role in ecosystems, Ecosystem functioning and management, Biomonitoring and ecological risk assessment  
8. **Financial and other possibilities** of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change

Department of Environmental Engineering, University of Rousse

1. **Address for correspondence**: 8, Studentska St. Rousse, Bulgaria  
   Tel.: +359 /82/ 279 233   Fax: Email: rdk@elits.rousse.bg  
2. **Director**: Vladimir Tomov  
3. **Contact person**: Vladimir Tomov  
   Tel.: +359 /2/ 279 233   Fax: Email: rdk@elits.rousse.bg  
4. **Staff**: persons ( professors, senior researchers, specialists)  
5. **Scientists, working in the area related to the global change** (including young scientists)  
   Vladimir Tomov, Prof., PhD, engineer, 54  
   Petar Donchev, Prof., PhD, geology, 60  
   Ivan Baitchev, Prof., PhD, veterinary,  
   Stoyan Vlahov, Prof., PhD, microbiology,  
   Georgi Andonov, Prof., PhD,  
   Kalin Karadjov, lecturer, engineer, 48  
   Daniela Hristova, lecturer, biology, 46  
   Ralitsa Karamisheva, sen. lecturer, water engineer, 29  
   Dilyana Mincheva, senior lecturer, biotechnology, 30  
   Desislava Angelova, senior lecturer, chemistry, 29  
6. **Research departments**:  
7. **Domains of research activity**: Wastewater treatment, Waste management  
8. **Financial and other possibilities** of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change
IHDP Seed Grant Initiative Final Reports 1999-2000

**Department of Medical Genetics, Medical University Sofia**

1. **Address for correspondence:** Department of Medical Genetics, Medical University Sofia, University Hospital of Obstetrics and Gynecology, 2, “Zdrave” St., Sofia 1431, Bulgaria
   
   **Tel.:** +359 /2/ 517 202  **Fax:** +359 /2/ 517 202  **Email:** draga@sofiaonline.com

2. **Director:** Rector Prof. Ovcharov

3. **Contact person:** Draga Toncheva, Assoc. Prof. PhD
   
   **Tel.:** +359 /2/ 517 202  **Fax:** +359 /2/ 517 202  **Email:** draga@sofiaonline.com

4. **Staff:** persons (professors, senior researchers, specialists)

5. **Scientists, working in the area related to the global change (including young scientists):**
   
   - Draga Toncheva, Assoc. Prof. PhD, medical genetics, 49
   - Angel Galabov, Prof. DSc, 60
   - Tzvetan Dimitrov, Prof. DSc, 68
   - Kamarinchev, Prof. DSc, 57
   - Elena Georgieva, Assoc. Prof. PhD, molecular geneticists, 51
   - Soian Lalchev, Assoc. Prof. PhD, medical genetics, 49
   - Boriana Zaharieva, molecular geneticists, 26
   - Srebrena Atanassova, molecular geneticists, 29
   - Petranka Ilieva, PhD, medical genetics, 58

6. **Research departments:**

7. **Domains of research activity:**
   
   - Molecular genetic studies of p53 mutations in family cases with breast cancer funded by The Bulgarian Ministry of Education and Sciences.
   - Studies of p53 mutations and spontaneous abortions supported by the Medical University Sofia.
   - Genetic heterogeneity of G6PD in Bulgarian, Russian and Vietnamese populations; alpha-1-antitrypsine polymorphism and mutant alleles of CYP2D6 was supported by WHO.
   - Molecular-cytogenetic studies - fluorescence in situ hybridisation (FISH) of patients with leukemias, solid tumors, chromosomal diseases, spontaneous abortions, unfertilised oocytes, preimplantation diagnosis, etc.
   - INCO-COPERNICUS project together with the National Center of Science Research – Athens and the Institute of Experimental Botany, Czech Academy of Science, collaborative studies with Freie Universitaet and Aristotel University, Thessaloniki.
   - INCO-COPERNICUS project “Epidemiology and genetics of the urinary tract tumors in patients with Balkan Endemic Nephropathy” with participation of colleagues from Germany and Netherlands.
   - “ Collaborative study of genetic etiology of psychiatric disorders” together with Department of Neuropsychiatryc Genetics (DNG), University of Wells in Cardiff, UK, Professor Michael Owen, FRCPscyh, PhD are now current research collaborations.
   - Training of molecular biologist from the Department had been realised in the solid tumor cytogenetic laboratory in the Childrens’ Cancer Research Institute (CCRI), Vienna with the aim FISH and comparative genomic hybridisation (CGH) to be learned. The methods are now being introduced using the ISIS software (MetaSystems, Germany). In collaboration with CCRI, Vienna data on molecular cytogenetic changes in Balkan endemic nephropathy have been obtained.

8. **Financial and other possibilities of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change**
IHDP Seed Grant Initiative Final Reports 1999-2000

**Department of Toxicology-National Center of Hygiene Medical Ecology**

1. **Address for correspondence:**
   Tel.: +359 /2/ 666 517, +359 /2/ 593045  
   Fax: +359 /2/ 593 045  
   Email: T.popov@nch.aster.net

2. **Director:** Popov, Todor Angelov, Prof, PhD

3. **Contact person:** Popov, Todor Angelov, Prof, PhD  
   Tel.: +359 /2/ 666 517, +359 /2/ 593045  
   Fax: +359 /2/ 593 045  
   Email: T.popov@nch.aster.net

4. **Staff:** persons (professors, senior researchers, specialists).

5. **Scientists, working in the aria related to the global change (including young scientists)**
   Name and Family, rank, Scientific Degree, speciality, age

6. **Research departments:** Laboratories: Biomonitoring, Risk assessment, and Experimental toxicology.

7. **Domains of research activity:** Assessment of potential hazards associated with the production and use of different types of chemical substances and the corresponding legislation activities, biomonitoring of early adverse effects, target orientated medical check-up examinations of workers exposed to different chemical hazards, and health risk assessment

8. **Financial and other possibilities of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change**

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**Energoproekt PLC**

1. **Address for correspondence:** 51,” J. Boucher” St., Sofia, Bulgaria  
   Tel.: +359 /2/ 68 80 34  
   Fax: +359 /2/ 66 89 51  
   Email: nhv@enpro.bg

2. **Director:** Dipl. Eng. Milcho Golemehoov

3. **Contact person:** Hristo Vassilev, Sen. Res. Assoc., Ph. D  
   Tel.: +359 /2/ 68 80 34  
   Fax: +359 /2/ 66 89 51  
   Email: nhv@enpro.bg

4. **Staff:** 380 persons (e.t.c.: Sen. Res. Assoc.- 11, specialists- 300)

5. **Scientists, working in the aria related to the global change (including young scientists)**
   Christo Christov, chief of Department, Sen. Res. Assoc, Ph. D., energy, forecasts and ecology, 51  
   Todor Panchev, chief of Department, Sen. Res. Assoc., fuel combustion technologies, 54  
   Sevdalina Todorova, M.Sc., economics and ecology, 30

6. **Research departments:** System analysis, Fuel combustion processes, Economics and energy forecasts, Nuclear safety, Thermoenergy problems, Hydroenergy

7. **Domains of research activity:** Electricity generation, transmission and distribution, System analysis- global change problems mitigation measures of GHG emissions, inventory and forecasts, Hydropower plants- forecasts, researches, design, Nuclear safety and security, Thermal power plants- fuel combustion technologies, projects, water- chemical conditions, thermal networks, gas- pipe line system
8. Financial and other possibilities of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change

**Forest Research Institute, Bulgarian Academy of Sciences**

1. **Address for correspondence:** 132, St. Kliment Ohridski Blvd., 1756 Sofia, BULGARIA  
   *Tel.: +359 /2/ 622 050  Fax: +359 /2/ 622 965  Email: IVANRAEV@USA.NET*

2. **Director:** Ivan Todorov Raev, Prof. D. Sc.
3. **Contact person:** Prof. Ivan Todorov Raev D. Sc.  
   *Tel.: +359 /2/ 622 050  Fax: +359 /2/ 622 965  Email: IVANRAEV@USA.NET*

4. **Staff:** persons (professors, senior researchers, specialists)

5. **Scientists, working in the area related to the global change (including young scientists)**  
   Name and Family, rank, Scientific Degree, speciality, age

6. **Research departments:**  
   - Department of Forest Biology  
   - Department of Forest Ecology  
   - Department of Genetics, Introduction and Physiology of Forest Tree Species  
   - Department of Forest Entomology and Phytopathology  
   - Department of Forest Resources  
   - Forest Soil Science Laboratory  
   - Laboratory of Wildlife Ecology

7. **Domains of research activity:**  
   Fundamental and scientific-and-applied investigations in the fields of biology, ecology and conservation of the forest flora and fauna; on the structures and functioning of forest ecosystems; and on the conservation, regeneration, harvesting and sustainable development of forests.

8. **Financial and other possibilities of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change**

**Institute of Demography, Bulgarian Academy of Sciences**

1. **Address for correspondence:** "acad.G. Bontchev" Str, Bl. 6, Sofia 1113, Bulgaria  
   *Tel.: +359 /2/ 70 53 03, +359 /2/ 979 30 30  Fax: Email: Idemo@idemo.bas.bg*

2. **Director:** Emil Petrov Hristov, Assoc. Prof. PhD
3. **Contact person:** Emil Petrov Hristov, Assoc. Prof. PhD  
   *Tel.: +359 /2/ 70 53 03, +359 /2/ 979 30 30  Fax: Email: Idemo@idemo.bas.bg*

4. **Staff:** 35 persons (2 professors, 7 senior researchers, 8 specialists)

5. **Scientists, working in the area related to the global change (including young scientists)**  
   Emil Hristov, Assoc. Prof., PhD, Director and Head of Department, 61.  
   Nikolaj Golemanov, (Medicine), Prof. Dr. 67.  
   Vetka Zhekova, Senior Researcher, PhD, (Mathematics), 57.  
   Diana Challukova, Senior Researcher, Dr. (Medical Sociology), 62.  
   Genoveva Mihova, Assoc. Prof., PhD, Chief Assistant, Head of Department, 58.

6. **Research departments:** Demographic Structures and Processes; Demographic Behaviour and Family; Regional Demography and Specific Groups of Population.
7. Domains of research activity: Population problems and projections according to the national priorities and needs of population policy in the context of the global trends and changes. Theoretical, methodological and empirical studies on demographic structures and processes as: fertility, morbidity, mortality, migration and reproductive behaviour on national, regional and global levels. Models and techniques of factorial analyses and projections of population size and demographic and social structures. Interrelations between population and other systems as: environment, natural resources, technology, economic development. Formation of the national development in the frames of global trends.

Institute of Economics, Bulgarian Academy of Sciences

1. Address for correspondence: 3 Aksakov Street, 1040 Sofia, Bulgaria
Tel.: +359 /2/ 87-58-79 Fax: +359 /2/ 88-21-08 Email: ineco@bgearn.acad.bg

2. Director: Prof. Dr. Alexander Dimitrov
3. Contact person: Prof. Dr. Alexander Dimitrov
   Tel.: +359 /2/ 87-58-79 Fax: +359 /2/ Email: ineco@bgearn.acad.bg

4. Staff: 67 persons (12 professors, 30 senior researchers, specialists).

5. Scientists, working in the area related to the global change (including young scientists)
   Alexander Dimitrov Prof. PhD
   Ilija Georgiev, Prof. PhD
   Ivan Stoikov Prof. PhD
   Lilia Chankova, Ass. Prof. PhD
   Mitko Dimitrov, Ass. Prof. PhD
   Nikola Valchev, Ass. Prof. PhD
   Peter Dobrev Ass. Prof. PhD
   Vassil Tzanov, Ass. Prof. PhD

6. Research departments:
   Department "ECONOMIC DEVELOPMENT"
   Department "MACROECONOMIC POLICY"
   Department "ORGANISATION AND MANAGEMENT OF ECONOMIC SYSTEMS"
   Department "REGIONAL ECONOMICS AND ENVIRONMENT"
   Department "WORLD ECONOMY AND FOREIGN ECONOMIC RELATIONS"
   Department "WELFARE AND SOCIAL POLICY"
   Department "MATHEMATICAL ECONOMICS AND ECONOMETRICS"

7. Domains of research activity:
Theoretical base of the transition to a market economy in the specific Bulgarian conditions; strategies for Bulgaria's economic development; variants for the economic reforms; revealing the specific features and deformations of the enterprise adapting to the shocks, accompanying the macroeconomic reform in the conditions of undeveloped market; assessing the consequences for the Bulgarian economy from its association to the European Union; estimating the development and extent of balancing of the labour market and outlining the most necessary and expected changes which take place in a short- and medium- term perspective; substantiating the changes in the principles and machanisms of carrying out the policy for insurance against unemployment and stimulating the employment.

8. Financial and other possibilities of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change
**Institute of Fishing Resources – Varna**

1. **Address for correspondence:** P.O.Bx 72, 4, “Primorski” Blvd, Varna 9000, Bulgaria  
   **Tel.:** +359 /2/ 25 78 76  **Fax:** +359 /2/ 25 78 76  **Email:** ifr@abcis.bg, ifishres@varna.ttm.bg  
2. **Director:** Peter Kolarov, Prof. Dr.  
3. **Contact person:** Peter Kolarov, Prof. Dr.  
   **Tel.:** +359 /2/ 25 78 76  **Fax:** +359 /2/ 25 78 76  **Email:** ifr@abcis.bg, ifishres@varna.ttm.bg  
4. **Staff:** 30 persons (professors, senior researchers, specialists)  
5. **Scientists, working in the area related to the global change (including young scientists)**  
   Peter Kolarov, Prof., Dr. Sc., ichthyology, 68  
   Ivan Dobrovolov, Prof., Dr.Sc., ichthyology, 64  
   Stoiko Stoikov, Ass.Prof, Dr., benthos, 59  
   Violeta Velikova, Res.Ass., Dr., phytoplankton, 38  
   Georgi Daskalov, Res.Ass, Dr., ichthyology, 36  
   Daniella Petrova, Ress.Ass., Dr., phytoplankton, 38  
   Tzvetan Stanev, Ress.Ass, microbiology, 58  
   Konstantin Mikhailov, Res.Ass., ichthyology, 46  
   Vesselinia Mihneva, Res.Ass., zooplankton, 32  
   Petia Ivanova, Res.Ass., ichthyology, 31  
   Sonia Ouzounova, Res.Ass., benthos, 36  
   Slava Dineva, Ress.Ass., hydrochemistry, 36  
   Boianka Georgieva, biologist, zooplankton, 54  
6. **Research Departments:** Hydrobiology, Ichthyology  
7. **Domains of research activity:** Pollution and eutrophication of the Black Sea and adjacent lakes, Dynamics of the food standing stock in the Bulgarian Black Sea shelf, Status and dynamics of fish resources, population dynamics.  
8. **Financial and other possibilities of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change:** Yes

**Institute of Geography, Bulgarian Academy of Sciences**

1. **Address for correspondence:** “Acad. G. Bonchev” Str. Bl. 3, Sofia 1113, Bulgaria  
   **Tel.:** +359 /2/ 70-02-04  **Fax:** +359 /2/ 70-02-04  **Email:** geograph@bas.bg  
2. **Director:** Associate Professor Georgi Alexiev.  
3. **Contact person:** Associate Professor Georgi Alexiev  
   **Tel.:** +359 /2/ 70-02-04  **Fax:** +359 /2/ 70-02-04  **Email:** geograph@bas.bg  
4. **Staff:** 31 persons (including: Professors-1, Associate Professors-10, specialists-9)  
5. **Scientists, working in the area related to the global change (including young scientists)**  
   Stefan Velev, Associate Professor, PhD, geographer - physical geographer, 60 years old  
   Mariana Nikolova, researcher, PhD, geographer - physical geographer, 41 years old  
   Zoya Mateeva, researcher, PhD, geographer - physical geographer, 42 years old  
   Vladimir Vlaskov, researcher, 38 years old  
   Marina Yordanova, geographer - physical geographer, 61 years old  
   Georgi Alexiev, Associate Professor, PhD, geographer - physical geographer, 50 years old
Boris Kolev, Associate Professor, PhD, geographer- social and economic geography, 51 years old,
Margarita Ilieva, Associate Professor, PhD, geographer- social and economic geography, 52 years old
Luka Ziapkov, Dr. Ph.D geographer - physical geographer, 67 years old
Ivan Drenovski, researcher, PhD, geographer - physical geographer, 36 years old

6. Research departments: Physical Geography, Social and Economic Geography

7. Domains of research activity: General climatology, bioclimatology, Physical geography, Social and Economic Geography, Unfavourable natural phenomena and risk investigations of socio-economic vulnerability

8. Financial and other possibilities of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change

Institute of Water Problems, Bulgarian Academy of Sciences

1. Address for correspondence: “Ac. G. Bontchev” Str., Bl.1, Sofia 1113, Bulgaria
   Tel.: +359 /2/ 722 572    Fax: +359 /2/ 722 577    Email: SANTUR@BGCICT.ACAD.BG
2. Director: Prof. DSc. Ohanes Santurjian
3. Contact person: Prof. DSc. Ohanes Santurjian
   Tel.: +359 /2/ 722 572    Fax: +359 /2/ 722 577    Email: SANTUR@BGCICT.ACAD.BG
4. Staff: 80 persons (8 professors, 13 senior researchers, 24 specialists).
5. Scientists, working in the area related to the global change (including young scientists)
Name and Family, rank, Scientific Degree, speciality, age
6. Research departments:
   Section “Problems of multipurpose use and protection of water resources"
   Section “Problems of water resources quality"
   Section “Hydraulic and hydrophisical problems of water systems”.
   Section “Stability problems of hydraulic structures.”
   Laboratory “Ecological improvement of water systems”– in Veliko Tarnovo.
7. Domains of research activity:
   optimal planning and management of water resources systems and environmental impact assessment
   natural and waste water treatment and control of water resources quality
   underground water level control and water transfer and alkalisisation processes in soils of irrigation systems
   unsteady flows in pressure systems, channels and river beds (transition of high waves and flood protection)
   river bed deformation and erosion and stability of coastal zones
   hydraulics, stability and thermal regime of hydraulic structures
8. Financial and other possibilities of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change
N. Poushkarov Research Institute for Soil Science and Agroecology

1. Address for correspondence: 7, “Shosse Bankya” St. Sofia, Bulgaria
   Tel.: Fax: Email:
2. Director:
   Office Tel.: +359 /2/ 240 345. Fax: ++359 /2/ 248937 Email:
   svetrou@yahoo.com
4. Staff: persons (professors, senior researchers, specialists)
5. Scientists, working in the aria related to the global change (including young scientists)
   Assen Lazarov, Sen. Res. Assoc., PhD, civil engineer, 55
   Elka Tzvetkova, Sen. Res. Assoc., PhD, agronomist, 51
   Svetla Rousseva, Sen. Res. Assoc., PhD, physicist, 48
6. Research departments:
   Soil Erosion
7. Domains of research activity: Soil Erosion, Soil Physics
8. Financial and other possibilities of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental Change

National Institute of Meteorology and Hydrology, Bulgarian Academy of Sciences

1. Address for correspondence: 66, “Zarigradso shosse” Blvd, Sofia 1784, Bulgaria
   Tel.: +359 /2/ 975-39-86 Fax: Email:
2. Director:
3. Contact person: Assoc.Prof. Konstantin Tzankov
   Tel.: +359 /2/ 975-39-96 Fax: Email:
4. Staff: 800 persons (Professors - 5, Assoc. Prof. - 28, Reasearchers - 38, High education personal – 230)
5. Scientists, working in the aria related to the global change (including young scientists)
   Nikola Slavov, Prof. PhD
   Strahil Gerasimov, Prof. PhD
   Vladimir Sharov, Prof. DrSci
   George Gergov, Prof. DrSci
   Ekaterina Koleva, Ass. Prof. PhD
   PhD Marin Genev, Ass. Prof.
   Veselin Alexandrov, Ass. Prof. PhD
   Tzviatka Karagiozova, Ass. Prof. PhD
6. Departments: Climatology, Hydrology, Agrometeorology, River Sediment and Fluvial Processes
8. Financial and other possibilities of the institution to participate in the activities of NCCGC for research of the Human dimensions of the global environmental change - LIMITED
National Statistical Institute of Bulgaria

1. Address for correspondence: 2, “P. Volov” St. Sofia, 1504, Bulgaria
   Tel.: +359 /2/ 9857 2701 Fax: +359 /2/ 946 0109, +359 /2/ 44 33 95 Email: AHadjiiski@nsi.bg
2. President: Aleksandar Hadjiiski
3. Contact person: Stefan Venetz Tzonev
   Tel.: +359 /2/ 985 72 637 Fax: Email: Stzonev@nsi.bg
4. Staff: 1869 persons ( professors, senior researchers, specialists)
5. Scientists (personnel), working in the aria related to the global change 
   (including young scientists)
   Stefan Venetz Tzonev – head of unit, economist, 46
   Stoyanka Lukova Mastikova – chief expert, economist, 41
   Roumiana Zdravkova Ivanova - chief expert, economist, 42
6. Research departments: Researching of the Environment
7. Domains of research activity: Environmental Statistics
8. Financial and other possibilities of the institution to participate in the 
   activities of NCCGCh for research of the Human dimensions of the global 
   environmental change: To provide socio-economical and environmental information.

Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE)

1. Address for correspondence: 136, “Tzar Boris III” Blvd., Sofia 1618
   Tel.: +359 /2/ 563 001 Fax: +359 /2/ 554 158 Email: RIIDHE@bgcict.acad.bg
2. Director: Ass. Prof. Plamen Petkov, PhD, Eng. of Irrigation and Drainage
3. Contact person: Ass. Prof. Plamen Petkov
   Tel.: +359 /2/ 563 001 Fax: +359 /2/ 554 158 Email: RIIDHE@bgcict.acad.bg
4. Staff: Total - 82 (Prof., Dr.Sc. - 2, Ass.Prof., Dr. - 13, Res.Sc. - 15)
5. Scientists, working in the aria related to the global change (including young scientists)
   Plamen Petkov, Ass. Prof., PhD, Eng. of Irrigation and Drainage, 55
   Jivko Jivkov, Ass. Prof., PhD, Agronomist, 51
   Nely Gadjalska, Ass. Prof., PhD, Eng. of Irrigation and Drainage, 47
   Peter Dimitrov, Ass. Prof., PhD, Mathematician, 55
   Spaska Kalcheva, Ass. Prof., PhD, Agronomist, 49
   Bojidara Mladenova, Ass. Prof., PhD, Agronomist, 50
   Nikolay Tzankov, Scientific researcher, Eng. of Irrigation and Drainage, 46
   Boytcho Tenev, Scientific researcher, Eng. of Irrigation and Drainage, 45
6. Research departments:
   Scientific Department: Irrigation Systems, Drainage Systems, Crop Water
   Requirements and Irrigation Scheduling, Economics of Irrigated Agriculture,
   Hydraulics, Hydrotechnics and Construction of Irrigation and Drainage Systems, Pipe
   Pressure Networks and Pumping Station, Automation of Irrigation and Drainage
   Systems
   Laboratories: hydraulic, testing, for microirrigation, drainage, chemical and physical
   laboratories, laboratory for water and soil analyses etc.
   Servicing departments: Scientific Service Department, Scientific Documentation and
   Information Department, Experimental field with arable land, Workshops etc.
   Financial Accounting and Administrative Department
7. Domains of research activity:
Scientific research, consulting, training, expertise and engineering in the field of:
Irrigation and drainage, Irrigated agriculture, Melioration of agricultural land,
Ecological problems in irrigated and drained areas, Conservation and management
of water resources in agriculture, Hydraulic and hydrotechnical issues in irrigation
and drainage systems
Production and delivery of irrigation equipment for irrigation systems, research,
design and construction of irrigation systems

8. Financial and other possibilities of the institution to participate in the
activities of NCCGC for research of the Human dimensions of the global
environmental change: RIIDHE has experienced scientific and service personnel
and the necessary equipment to participate in activities for research of the human
dimensions of the global environmental change.

Union of Park & Landscape Specialists in Bulgaria

1. Address for correspondence: 29, “Metlichina poljana” St., Sofia 1404, Bulgaria
Tel.: + 359 /2/ 580 779    Fax: + 359 /2/ 958 1774    Email: radovano@sf.icn.bg
2. Director: PhD. Maria Samardjieva
3. Contact person: Marija Samardjieva
   Tel.: +359 /2/ 580 779    Fax: +359 /2/ 958 1774    Email: 
4. Staff: 60 persons (professors-3, senior researchers-4, specialists-about 50)
5. Scientists, working in the aria related to the global change (including young scientists)
   Marija Samardjieva - President, PhD, Landscape architecture
   Petja Radovanova - Project Co-ordinator, PhD, MSc, Environmental Sciences and
   Urban Ecology, 39
6. Research departments:
7. Domains of research activity: Programme Urban ecology and Landscape
   Architecture, Programme Public Participation and Public Awareness, Programme
   Public Health and Occupational Health, City of Tomorrow and Cultural Heritage
8. Financial and other possibilities of the institution to participate in the
activities of NCCGC for research of the Human dimensions of the global
environmental change. Support NCCGC with participation in expertise skills, with
information that we have gathered under the topic related to human dimensions of
environmental problems, with taking part in hearings and discussions.
Appendix 3

“Capacity Building for Bulgarian Human Dimension Programme”

Inventory of the specialists and the scientists working in the area of the HD/GEC

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<thead>
<tr>
<th>No</th>
<th>Family, Name, Second name</th>
<th>Email address</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>Alexiev, Georgi Tsvetkov</td>
<td><a href="mailto:alexievg@bas.bg">alexievg@bas.bg</a></td>
</tr>
<tr>
<td>2</td>
<td>Alexieva, Anelia Jivkova</td>
<td><a href="mailto:anelia_al@yahoo.com">anelia_al@yahoo.com</a></td>
</tr>
<tr>
<td>3</td>
<td>Angelova, Tzvetanka Nikolova</td>
<td><a href="mailto:angelo@ttm.bg">angelo@ttm.bg</a></td>
</tr>
<tr>
<td>4</td>
<td>Christov Christo Konstantinov</td>
<td><a href="mailto:nhh@enpro.bg">nhh@enpro.bg</a></td>
</tr>
<tr>
<td>5</td>
<td>Dainov, Evgenii Alexandrov</td>
<td><a href="mailto:CSPract@usa.net">CSPract@usa.net</a></td>
</tr>
<tr>
<td>6</td>
<td>Daskalov, Georgi Mihaylov</td>
<td><a href="mailto:gdaskalov@hotmail.com">gdaskalov@hotmail.com</a></td>
</tr>
<tr>
<td>7</td>
<td>Diankov, Ivan Stefanov</td>
<td><a href="mailto:stefanov@omega.bg">stefanov@omega.bg</a></td>
</tr>
<tr>
<td>8</td>
<td>Dimitrov, Dimitar Nikolov</td>
<td><a href="mailto:waterlab@vt.bia-bg.com">waterlab@vt.bia-bg.com</a>, <a href="mailto:dimitrov61@hotmail.com">dimitrov61@hotmail.com</a></td>
</tr>
<tr>
<td>9</td>
<td>Dimitrov, Peter Nikolov</td>
<td><a href="mailto:riidhe@bgcict.acad.bg">riidhe@bgcict.acad.bg</a>, <a href="mailto:dimitrov_peter@hotmail.com">dimitrov_peter@hotmail.com</a></td>
</tr>
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<td>10</td>
<td>Dineva, Slava Ivanova</td>
<td><a href="mailto:ifishres@varna.ttm.bg">ifishres@varna.ttm.bg</a></td>
</tr>
<tr>
<td>11</td>
<td>Dobrovolov, Ivan Stoyanov</td>
<td><a href="mailto:ifr@abcis.bg">ifr@abcis.bg</a>, <a href="mailto:ifishres@varna.ttm.bg">ifishres@varna.ttm.bg</a></td>
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<tr>
<td>12</td>
<td>Drenovski, Ivan Jotov</td>
<td><a href="mailto:idren@geophys.bas.bg">idren@geophys.bas.bg</a></td>
</tr>
<tr>
<td>13</td>
<td>Gadjalska, Nelly Ilieva</td>
<td><a href="mailto:RIIDHE@BGCICT.acad.BG">RIIDHE@BGCICT.acad.BG</a></td>
</tr>
<tr>
<td>14</td>
<td>Genev, Marin Gospodinov</td>
<td><a href="mailto:Marin.Genev@meteo.bg">Marin.Genev@meteo.bg</a></td>
</tr>
<tr>
<td>15</td>
<td>Georgieva, Boianka Marinova</td>
<td><a href="mailto:ifishres@varna.ttm.bg">ifishres@varna.ttm.bg</a></td>
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<tr>
<td>16</td>
<td>Gergov, George Ivanov</td>
<td><a href="mailto:Georgi.Gergov@meteo.bg">Georgi.Gergov@meteo.bg</a></td>
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<tr>
<td>17</td>
<td>Hristov, Todor Nikolov</td>
<td><a href="mailto:Hristov@bgcict.acad.bg">Hristov@bgcict.acad.bg</a></td>
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<tr>
<td>18</td>
<td>Iliev, Iliya Petrov</td>
<td><a href="mailto:iliev@fnpp.uni-sofia.bg">iliev@fnpp.uni-sofia.bg</a></td>
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<td>Ilieva, Margarita Milanova</td>
<td><a href="mailto:milieva@geophys.bas.bg">milieva@geophys.bas.bg</a></td>
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<td>20</td>
<td>Ivancheva, Ludmila Evlogieva</td>
<td><a href="mailto:livancheva@yahoo.com">livancheva@yahoo.com</a></td>
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<td>21</td>
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<td><a href="mailto:ifr@abcis.bg">ifr@abcis.bg</a></td>
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<tr>
<td>22</td>
<td>Ivanova, Roumiana Zdravkova</td>
<td><a href="mailto:Rivanova@nsi.bg">Rivanova@nsi.bg</a></td>
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<tr>
<td>23</td>
<td>Jordanova, Marina Dimitrova</td>
<td><a href="mailto:mar.yord@mbox.bol.bg">mar.yord@mbox.bol.bg</a></td>
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<tr>
<td>24</td>
<td>Kalcheva, Spaska Georgieva</td>
<td><a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a></td>
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<td>25</td>
<td>Karagiozova, Tzvhatka Ivanovalova</td>
<td><a href="mailto:Georgi.Gergov@meteo.bg">Georgi.Gergov@meteo.bg</a></td>
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<td>26</td>
<td>Knight, C. Gregory</td>
<td><a href="mailto:cgk@psu.edu">cgk@psu.edu</a></td>
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<tr>
<td>27</td>
<td>Kolev, Boris Todorov</td>
<td><a href="mailto:bkolev@bas.bg">bkolev@bas.bg</a></td>
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<td>28</td>
<td>Lazarov, Assen Lazarov</td>
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<td>Mastikova, Stoyanka Lukova</td>
<td><a href="mailto:Smastikova@nsi.bg">Smastikova@nsi.bg</a></td>
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<td>Mateeva, Zoya Spasova</td>
<td><a href="mailto:zoya@bgcict.acad.bg">zoya@bgcict.acad.bg</a></td>
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<td>31</td>
<td>Mihneva, Vesselina Vassileva</td>
<td><a href="mailto:ifishres@varna.ttm.bg">ifishres@varna.ttm.bg</a></td>
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<td>32</td>
<td>Mikhailov, Konstantin Rashev</td>
<td><a href="mailto:ifishres@varna.ttm.bg">ifishres@varna.ttm.bg</a></td>
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<td>Mishev, Dimitar</td>
<td><a href="mailto:Mishev@vmsys.stil.acad.bg">Mishev@vmsys.stil.acad.bg</a></td>
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<td>34</td>
<td>Mladenova-Steffanova,</td>
<td><a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a></td>
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<td>35</td>
<td>Bojidara Petrova</td>
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<td>36</td>
<td>Nikolova, Mariana Kostadinova</td>
<td><a href="mailto:nikonova_nina@hotmail.com">nikonova_nina@hotmail.com</a></td>
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<td>Ouzounova, Sonia Todorova</td>
<td><a href="mailto:ifr@abcis.bg">ifr@abcis.bg</a>, <a href="mailto:sonia_ouz@yahoo.com">sonia_ouz@yahoo.com</a></td>
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<td><a href="mailto:ifr@abcis.bg">ifr@abcis.bg</a>, <a href="mailto:ifishres@varna.ttm.bg">ifishres@varna.ttm.bg</a></td>
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<td><a href="mailto:Philipovphilip@hotmail.com">Philipovphilip@hotmail.com</a></td>
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<td>44</td>
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<td>45</td>
<td>Radovanova Petia Ivanova</td>
<td><a href="mailto:parkland@sf.icn.bg">parkland@sf.icn.bg</a>, <a href="mailto:radovano@sf.icn.bg">radovano@sf.icn.bg</a></td>
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<td>Ratchev, Georgi Dontchev</td>
<td><a href="mailto:ratchevq@ns.uni-sofia.bg">ratchevq@ns.uni-sofia.bg</a>, <a href="mailto:compass@bitex.com">compass@bitex.com</a></td>
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<td>50</td>
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<td><a href="mailto:ISSIM@bgcict.acad.bg">ISSIM@bgcict.acad.bg</a>, <a href="mailto:ISSIM@microbio.bas.bg">ISSIM@microbio.bas.bg</a>, <a href="mailto:ISSIM@bas.bg">ISSIM@bas.bg</a>, <a href="mailto:ISSIM1@usa.net">ISSIM1@usa.net</a></td>
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<td>51</td>
<td>Slaveikov, Peter Lozanos</td>
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<td>52</td>
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<td>Zlatunova, Daniela Slavcheva</td>
<td><a href="mailto:zlatunova@gea.uni-sofia.bg">zlatunova@gea.uni-sofia.bg</a></td>
</tr>
</tbody>
</table>
Alexiev, Georgi Tsvetkov

1. Scientific degrees: Associate Professor, PhD
2. Institute/enterprise/company/NGO: Institute of Geography, Bulgarian Academy of Sciences
3. Address: “Ac. Georgi Bonchev” St., Bl. 3, 1113 Sofia, Bulgaria
   Office: Tel.: +359 /2/ 979 33 60 Fax: +359 /2/ 973 36 84
   Email: alexievg@bas.bg
   Home: Tel.: +359 /2/ 76 78 06
4. Date and place of birth: 06.03.1950, Pernik, Bulgaria
5. Education and Specialisation:

<table>
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<th>Education, Specialisation</th>
<th>University, Institute</th>
<th>Year: from - to</th>
</tr>
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<tbody>
<tr>
<td>University education</td>
<td>University &quot;St. Kliment Ohridski&quot;, Sofia-Physical Geography</td>
<td></td>
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6. Principal field of interest: geomorphology, Morphostructural Analysis, Recent Geodynamics.
7. Professional employment in the institute/enterprise/company/NGO:

<table>
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<th>Position</th>
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<tbody>
<tr>
<td></td>
<td>Institute of Geography</td>
<td>Director</td>
</tr>
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</table>

8. Scientific research:
   Alexiev, G. (in co-authorship), 1994. Geological Hazards – a map, scale 1: 500 000 with explanatory text, Bulgarian Academy of Sciences
   Alexiev, G., I. Vaptsarov, 1994. Geomorphological characteristics of the Quaternary Tectonic Processes within the Tunja structural Depression. Problems of Geography, No4
   Alexiev, G., 1995. Morphotectonic characteristics of the Vitosha dome Morphostructure and geomorphological risk Assessment. Problems of Geography No1,
9. Participation in councils and commissions

<table>
<thead>
<tr>
<th>Year: from - to</th>
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<td>1996-</td>
<td>Scientific Council of the Institute of Geography</td>
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<tr>
<td>2000-</td>
<td>General Assembly of the Bulgarian Academy of Sciences</td>
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10. Knowledge of languages: Russian, English
11. Computer literacy: good

Alexieva, Anelia Jivkova

1. Scientific degrees:
2. Institute/enterprise/company/NGO: Institute of Water Problems, Bulgarian Academy of Sciences
3. Address: “Acad.G. Bonchev” St., bl.1, Sofia 1113, Bulgaria
   Office Tel.: +359 /2/ 979 39 50
   Home: Tel.: +359 /2/ 76 28 38 Email: anelia_al@yahoo.com
4. Date and place of birth: 08.10.1974, Belogradtchik, Bulgaria
5. Education and Specialisation:

<table>
<thead>
<tr>
<th>Education, Specialisation</th>
<th>University, Institute</th>
<th>Year: from - to</th>
</tr>
</thead>
<tbody>
<tr>
<td>University education</td>
<td>University “Sv. Kliment Ohridski”, Sofia, Department of Chemistry, ecology</td>
<td></td>
</tr>
</tbody>
</table>
6. **Principal field of interest:** Environmental problems, methods for analytical
determination of air, soil and water pollutants, GIS and GPS - technologies.

7. **Professional employment in the institute/enterprise/company/NGO**

<table>
<thead>
<tr>
<th>Period: from - to</th>
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<th>Position</th>
</tr>
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<tbody>
<tr>
<td>1999-</td>
<td>Institute of Water Problems,</td>
<td>Ecologist</td>
</tr>
</tbody>
</table>

8. **Scientific research (up to 15 titles in the area concerned with global change):**

9. **Participation in councils and commissions:**

10. **Knowledge of languages:** English

11. **Computer literacy:** ArcView, MapInfo, AutoCad

**Angelova, Tzvetanka Nikolova**

1. **Scientific degrees:**
2. **Institute/enterprise/company/NGO:** Dept. of Nauka Invest, Trade Company
   owned by Union of Scientists in Bulgaria
3. **Address:** Oborishte st., Sofia 1504, Bulgaria
   **Office:** Tel.: Email:
   **Home:** Tel.: +359 /02/ 44 36 02 Fax.: Email:
   angelo@ttm.bg
4. **Date and place of birth:** 21.04.1951, Sofia, Bulgaria
5. **Education and Specialisation:**

<table>
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<th>University, Institute</th>
<th>Year: from - to</th>
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<tr>
<td>Graduation in mathematics profile</td>
<td>&quot;Mme De Stael&quot; French Lycee, St.Julien-en-Jenevois, near Grenoble, France</td>
<td>1969 - 1971</td>
</tr>
<tr>
<td>&quot;English and French Language and Literature&quot;, Switzerland</td>
<td>University of Neuchatel</td>
<td>1971 - 1972</td>
</tr>
<tr>
<td>&quot;English Language and Literature&quot;, second speciality “Italian language”</td>
<td>Sofia University</td>
<td>1972 - 1976</td>
</tr>
<tr>
<td>post-graduate specialisation</td>
<td>England</td>
<td>1976</td>
</tr>
<tr>
<td>Computer literacy</td>
<td>course organised by Union of Scientists in Bulgaria (USB), Sofia</td>
<td>1990</td>
</tr>
<tr>
<td>“How to work with NGO volunteers”, short course</td>
<td>Washington, Virginia, USA, Water Environment Federation, USA</td>
<td></td>
</tr>
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</table>

6. **Principal field of interest:** Administrative activities, public policy orientation of
NGOs, Contracting and providing of services and facilities for the organisation of
congresses, conferences & seminars

7. **Professional employment in the institute/enterprise/company/NGO**

<table>
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<th>Position</th>
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<tr>
<td>1977 - 1980</td>
<td>Committee for Immunology of Reproduction, Sofia</td>
<td>Organising secretary</td>
</tr>
<tr>
<td>1980 - 1987</td>
<td>Dept. of the USB</td>
<td>Head of International Relations</td>
</tr>
<tr>
<td>1987 - 1991</td>
<td>Union of Scientists in Bulgaria</td>
<td>Organisation Secretary and Co-ordinate</td>
</tr>
<tr>
<td>1991 - 1996</td>
<td>Dept. of the Union of Scientists in Bulgaria</td>
<td>Head of International Relations and Congresses</td>
</tr>
<tr>
<td>1996 -</td>
<td>Dept. of Nauka Invest, trade company owned by Union of Scientists in Bulgaria</td>
<td>Head of Congresses and Publishing and Responsible for International Relations and</td>
</tr>
</tbody>
</table>
Christov, Christo Konstantinov

1. Scientific degrees: Senior Research Associate, Ph. D.
2. Institute/enterprise/company/NGO: Energoproekt PLC
3. Address: 51, J. Boucher Blvd, 1407 Sofia, Bulgaria
   Office: Tel.: +359 /2/ 68 80 34    Fax: +359 /2/ 66 89 51    Email: nhh@enpro.bg
   Home: Tel.: +359 /2/ 59 16 47
4. Date and place of birth: 15,09.1948, Pleven, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education</td>
<td>Moscow Institute of Power Engineering</td>
</tr>
<tr>
<td>M.Sc.</td>
<td>Moscow Institute of Power Engineering</td>
</tr>
</tbody>
</table>

6. Principal field of interest: Emergency control of electric power systems, Start-up of the nuclear power units, Energy system expansion planning, Electric power system transients and steady-state stability, Design and investigations of 750 kV tie-line, Nuclear Power plants and HV- transmission network, Development of fuel and energy balances, Electric networks expansion planning, Study on high voltage transmission network, Climate changes, Greenhouse Gases emission sources and sinks, Development of the energy sector.

7. Professional employment in the institute/enterprise/company/NGO

<table>
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<th>Period: from - to</th>
<th>Institute, enterprise, company</th>
<th>Position</th>
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<tbody>
<tr>
<td>1973 - 1976</td>
<td>Direct current motors enterprise, Sofia</td>
<td>Automation engineer</td>
</tr>
<tr>
<td>1976 - 1986</td>
<td>Energoproekt, Sofia</td>
<td>Research Associate</td>
</tr>
<tr>
<td>1979 - 1990</td>
<td>Energoproekt, Sofia</td>
<td>Senior research associate, Head of Department, Co-ordinator and manager of the Bulgaria Study to Address Climate Change and the project on National Climate Change Action Plan under the US Countries Studies Programme (CSP).</td>
</tr>
<tr>
<td>1990 - up to now</td>
<td>Energoproekt, Sofia</td>
<td>Senior research associate, Head of Department, Co-ordinator and manager of the Bulgaria Study to Address Climate Change and the project on National Climate Change Action Plan under the US Countries Studies Programme (CSP).</td>
</tr>
<tr>
<td>1996 - 1997</td>
<td>National Electric Company, Sofia</td>
<td>Vice Chairman of the Board of Directors</td>
</tr>
<tr>
<td>1996 - 1999</td>
<td>Energoproekt, Sofia</td>
<td>Head of Division</td>
</tr>
<tr>
<td>1998 - up to now</td>
<td>Energoproekt, Sofia</td>
<td>Head of Complex Information Services and System Analysis Department</td>
</tr>
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</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)
Christov, Ch. and others, 1995. - Bulgaria GHG Emission Inventory and Projections. Proceedings of International Workshop for Strengthening International Partnership., Baden, Austria,
Christov Ch. and others, 1996. - Bulgaria Energy Sector and global Climate Change Energy Forum’96, Varna, 14-16 June, (in Bulgarian)
Christov Ch. and others, 1996. - Assessment of Options to Mitigate the Greenhouse Gas Emissions from Energy Demand, Energy Forum’96, Varna, 14-14 June, (in Bulgarian).
9. Participation in councils and commissions
10. Knowledge of languages: English, Russian
Dainov, Evgenii Alexandrov

1. Scientific degrees: Associate Prof. PhD
2. Institute/enterprise/company/NGO: Center for Social Practices
3. Address: 4 “Dunav” St., fl.1, Sofia 1000, Bulgaria
   Office: Tel.: +359 /2/ 981 72 22, +359 /2/ 980 81 70  Fax: +359 /2/ 981 72 22,
   +359 /2/ 980 81 70  Email: CSPract@usa.net
4. Date and place of birth: 1958, Plovdiv, Bulgaria
5. Education and Specialisation:

<table>
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<tr>
<th>Education and Specialisation</th>
<th>University, Institute</th>
<th>Year: from - to</th>
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<tbody>
<tr>
<td>Secondary level</td>
<td>Forest Hill School, London</td>
<td></td>
</tr>
<tr>
<td>University</td>
<td>Corpus Christi College, Oxford</td>
<td></td>
</tr>
<tr>
<td>First Class degree in Mod. History and Mod. Language</td>
<td>Corpus Christi College, Oxford</td>
<td>1979</td>
</tr>
<tr>
<td>MA in Mod. History and Mod. Language</td>
<td>Corpus Christi College, Oxford</td>
<td>1985</td>
</tr>
<tr>
<td>Modern French Politics</td>
<td>Fondation Nationale des Sciences Politiques, Paris</td>
<td>1984-85</td>
</tr>
<tr>
<td>Visiting Fellow</td>
<td>St Antony’s College, Oxford</td>
<td>1985-86</td>
</tr>
<tr>
<td>PhD in Modern Political History</td>
<td>Supreme Council of Modern History at Bulgarian Academy of Sciences, Sofia</td>
<td>1985</td>
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6. Principal field of interest:

7. Professional employment in the institute/enterprise/company/NGO

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<tr>
<td>1982-1989</td>
<td>Institute of History, Sofia</td>
<td>Researcher</td>
</tr>
<tr>
<td>1987-1990</td>
<td>Sofia University</td>
<td>Lecturer, History of Political Philosophies</td>
</tr>
<tr>
<td>1990</td>
<td>Chair of National Confederation of Independent Trades Unions, Sofia</td>
<td>Adviser</td>
</tr>
<tr>
<td>1989-1991</td>
<td>Centre for the Study of Democracy</td>
<td>Director of European Studies</td>
</tr>
<tr>
<td>1993-1994</td>
<td>President of Republic of Bulgaria</td>
<td>Consultant</td>
</tr>
<tr>
<td>1992-</td>
<td>The Insider magazine</td>
<td>Editor in Chief</td>
</tr>
<tr>
<td>1993-</td>
<td>Centre for Liberal Strategies, Sofia</td>
<td>Analyst</td>
</tr>
<tr>
<td>1989-</td>
<td></td>
<td>Free lance writer and newspaper columnist</td>
</tr>
<tr>
<td>1994-</td>
<td>Centre for Social Practices, Sofia</td>
<td>Director</td>
</tr>
<tr>
<td>1997</td>
<td>Political Academy for Central and Eastern Europe</td>
<td>Programme Director</td>
</tr>
<tr>
<td>1997-</td>
<td>New Bulgarian University</td>
<td>Lecturer in Political Science</td>
</tr>
<tr>
<td>1999</td>
<td>New Bulgarian University</td>
<td>Associate Professor</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)

9. Participation in councils and commissions

<table>
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<tr>
<th>Year: from - to</th>
<th>Name of the council or the commission</th>
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</thead>
<tbody>
<tr>
<td>1992-1994</td>
<td>Bulgarian Association of Newspaper Publishers, President</td>
</tr>
<tr>
<td>1995-1997</td>
<td>Union of Bulgarian Foundations, Board Member</td>
</tr>
<tr>
<td>1997-</td>
<td>Open Society Foundation – Sofia, Board Member</td>
</tr>
<tr>
<td>1998-</td>
<td>Open Society Foundation, Chair</td>
</tr>
</tbody>
</table>
10. Knowledge of languages: English
11. Computer literacy:

Daskalov, Georgi Mihaylov

1. Scientific degrees: Research scientist, PhD
2. Institute/enterprise/company/NGO: Institute of Fisheries, Varna, Bulgaria
3. Address: P.O. Box 72, 4 Primorski Bd., Varna 9000, Bulgaria
   Office   Tel.: +359 /52/ 25 78 76   Fax: +359 /52/ 25 78 76
   Email: gdaskalov@hotmail.com
   Home: Tel.: +359 /52/ 2 52 19
4. Date and place of birth: 04.07.63, Varna, Bulgaria
5. Education and Specialisation:

<table>
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<th>University, Institute</th>
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<tbody>
<tr>
<td>University education</td>
<td>Sofia University “St. Kliment Ohridski”, Bulgaria</td>
<td></td>
</tr>
<tr>
<td>M.Sc. (Biology,)</td>
<td>Sofia University “St. Kliment Ohridski”, Bulgaria</td>
<td>1989</td>
</tr>
<tr>
<td>D.E.A. (~M.S., Marine environmental sciences)</td>
<td>Université d’Aix-Marseille II, Centre d’Océanologie de Marseille, France</td>
<td>1993</td>
</tr>
<tr>
<td>PhD (Marine environmental sciences)</td>
<td>Université d’Aix-Marseille II, Centre d’Océanologie de Marseille, France</td>
<td>1998</td>
</tr>
</tbody>
</table>
6. Principal field of interest: Fish stock assessment and management: integrated stock assessment models, stock-recruitment, overexploitation; Biological oceanography: long-term changes in marine ecosystems, climate regimes, teleconnections, anthropogenic influence, eutrophication; Marine ecosystems: food web models, “top-down” and “bottom-up” control, trophic cascades; Statistical modelling: non-linear models, time-series, multivariate analyses.
7. Professional employment in the institute/enterprise/company/NGO:

<table>
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<th>Period: from - to</th>
<th>Position</th>
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<tbody>
<tr>
<td>Institute, enterprise, company</td>
<td>Research scientist</td>
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</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)
DASKALOV, G., and PRODANOV, K. 1998. Marine environmental conditions and fishery productivity in the Black Sea: In DURAND M.-H., Ph.. CURY, R.


9. Participation in councils and commissions

<table>
<thead>
<tr>
<th>Year: from - to</th>
<th>Name of the council or the commission</th>
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<tbody>
<tr>
<td>1994-1997</td>
<td>Resource Assessment, Modelling and Survey (RAMS) Committee of the GEF’s Black Sea Environm. Programme (BSEP)</td>
</tr>
</tbody>
</table>

10. Visits and stays abroad: Centre d’Océanologie de Marseille, France; ORSTOM, France; ICM-CSIC, Barcelona, Spain; CIHEAM (International Centre for Advanced Mediterranean Agronomic Studies) Zaragoza, Spain; ICES, Kopenhagen, Denmark; IMR, Bergen, Norway; IMBC, Iraklio, Greece.

11. Knowledge of languages: English (fluent), French (fluent), Russian (fluent)


Djankov, Ivan Stefanov

1. Scientific degrees:

2. Institute/enterprise/company/NGO:

3. Address: 28, “Gurguljat” St., Fl. 4, ap. 12, Sofia 1463, Bulgaria

4. Date and place of birth: 12.10.1936, Bulgaria

5. Education and Specialisation:

<table>
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<tr>
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<th>University, Institute</th>
<th>Year: from - to</th>
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<tr>
<td>University education</td>
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</tr>
<tr>
<td>Patent Specialist Diploma</td>
<td>Technical University, Sofia</td>
<td>1970-1972</td>
</tr>
<tr>
<td>PhD Hydrogeology and Engineering Geology</td>
<td>University of Mining and Geology, Sofia</td>
<td>1954-1962</td>
</tr>
<tr>
<td>Specialisation in: Ecology</td>
<td>Ministry of Environment and Water, Sofia</td>
<td></td>
</tr>
<tr>
<td>specialisation in: Hydrogeological drilling and wells for fresh water</td>
<td>University of Mining and Geology, Sofia</td>
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6. Principal fields of interest:

7. Professional employment in the institute/enterprise/company/NGO

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<th>Position</th>
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<tr>
<td></td>
<td>SRTI “Energoprojekt” - Sofia</td>
<td>Team Leader</td>
</tr>
<tr>
<td></td>
<td>SRTI “Energoprojekt” - Sofia</td>
<td>Head of Technology</td>
</tr>
<tr>
<td></td>
<td>SRTI “Energoprojekt” - Sofia</td>
<td>Senior Engineer-Hydrogeologist</td>
</tr>
</tbody>
</table>
8. Scientific research (up to 15 titles in the area, concerned with global change)

SRTI “Energoprojekt" - Sofia, Bulgaria, 1981. Underground freshwater pollution and hygienically-protected zones determination around the fresh water sources equipment

Djankov, I. S., 1992. Industry and environment protection, in proceedings of The International Workshop organised by Karl-Duisburg Center, Köln, Germany


9. Participation in councils and commissions

10. Knowledge of languages: English, German, Russian

11. Computer literacy:

Dimitrov, Dimitar Nikolov

1. Scientific degrees: Research Associate, Chemical Engineer

2. Institute/enterprise/company/NGO: Research Laboratory – Veliko Turnovo, Institute of Water Problems, Bulgarian Academy of Sciences

3. Address: RL – IWP – BAS, P.O.Box 195, Veliko Turnovo 5000, Bulgaria

   Office: Tel.: +359 /62/ 630 123
   Home: Email: waterlab@vt.bia-bg.com
   Email: dimitrov61@hotmail.com

4. Date and place of birth: 21.10.1961, Suhindol, Bulgaria

5. Education and specialisation:

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<th>Year: from - to</th>
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<tr>
<td>University education</td>
<td>Higher Institute of Chemical Technology, Bourgas, Bulgaria</td>
<td></td>
</tr>
<tr>
<td>Specialisation</td>
<td>Bulgaria, Assessment of the impact on the environment, 1 month</td>
<td></td>
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6. Principal field of interest: Water pretreatment, Wastewater treatment, Modelling of in-stream water quality

7. Professional employment in the institute/enterprise/company/NGO

<table>
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<th>Position</th>
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<tr>
<td>Institute of Water Problems</td>
<td>Research scientist</td>
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</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)


9. Participation in councils and commissions:
10. Knowledge of languages: English, Russian, German
11. Computer literacy: Programming in Pascal, Delphi and VBA; Spreadsheets; Text-processing; GIS.

**Dimitrov, Peter Nikolov**

1. **Scientific degrees**: Associated Professor, PhD
2. **Institute/enterprise/NGO**: Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE)
3. **Address**: 136, Tzar Boris III Blvd., 1618 Sofia, Bulgaria
   - **Office** Tel.: +359 /2/ 550 262 Fax: +359 /2/ 554 158 Email: riidhe@bgcict.acad.bg
   - **Home**: Tel.: +359 /2/ 569 941 Email: dimitrov_peter@hotmail.com
4. **Date and place of birth**: 25.06.1944, Shumen, Bulgaria
5. **Education and Specialisation**:

<table>
<thead>
<tr>
<th>Education, Specialisation</th>
<th>University, Institute</th>
<th>Year: from - to</th>
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</table>
Informatics | Bulgaria
--- | ---
PhD, Water Distribution Systems Modelling | Budapest University of Technology and Economics | 1975-1979

6. **Principal field of interest**: Mathematical and Computer Modelling in Plant-growing, Impact of Climate Changes and Irrigation on Agriculture, Water Distribution Management and Irrigation Scheduling under Water Deficit Conditions, Ecological Use of Irrigation Areas.

7. **Professional employment in the institute/enterprise/company/NGO**

<table>
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<tr>
<th>Period: from - to</th>
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<th>Position</th>
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<tbody>
<tr>
<td>1985-1989</td>
<td>Budapest University of Technology and Economics</td>
<td>Senior Research Fellow</td>
</tr>
<tr>
<td>1990-present</td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering</td>
<td>Department Head, Senior Research Fellow</td>
</tr>
<tr>
<td>1995-present</td>
<td>Ecological Agriculture, NGO</td>
<td>Member</td>
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8. **Scientific research** (up to 15 titles in the area, concerned with global change)


9. **Participation in councils and commissions**

<table>
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<tr>
<td>1995-now</td>
<td>RIDHHE, Science Council</td>
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<tr>
<td>1999-now</td>
<td>Ministry of Education and Science, Expert Council of Agriculture, Forestry and Fishery</td>
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10. **Knowledge of languages**: English, Hungarian, Russian, German)

11. **Computer literacy**: Win2000, MSOffice, GIS, Fortran, Pascal, Vis.Basic
Dineva, Slava Ivanova

1. **Scientific degrees:** Research. Ass.
2. **Institute/enterprise/NGO:** Institute of Fishing Resources - Varna
3. **Address:** P.O. Box 72, 4 Primorski Bd., Varna 9000, Bulgaria,
   **Office Tel.:** +359 /52/ 25 78 76    **Fax:** +359 /52/ 25 78 76
   **Email:** ifishres@varna.ttm.bg
   **Home:**   **Tel.:** +359 /52/ 25 12 19
4. **Date and place of birth:** 10.10.1963, Aitos, Bulgaria
5. **Education and Specialisation:**

<table>
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<th>Education, Specialisation</th>
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<tbody>
<tr>
<td>University education</td>
<td>Bourgas Technical University, Technology of Water.</td>
<td></td>
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6. **Principal field of interest:** Hydrochemistry, hydrophysics, ecology.
7. **Professional employment in the institute/enterprise/NGO:**

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<th>Institute, enterprise, company</th>
<th>Position</th>
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<tr>
<td>Institute of Fishing Resources - Varna</td>
<td>Res. Ass. in the Lab. Hydrobiology</td>
<td></td>
</tr>
</tbody>
</table>

8. **Scientific research (up to 15 titles in the area, concerned with global change)**


9. **Participation in councils and commissions**
10. **Knowledge of languages:** Russian, English.
Dobrovolov, Ivan Stoyanov

1. **Scientific degrees:** Prof., Dr.Sc.
2. **Institute/enterprise/company/NGO:** Institute of Fishing Resources - Varna
3. **Address:** P.O. Box 72, 4, “Primorski” Blvd., Varna 9000, Bulgaria
   - **Office:** Tel.: +359 /52/ 25 78 76  **Fax:** +359 /52/ 25 78 76  **Email:** ifr@abcis.bg, ifishres@varna.ttm.bg
4. **Date and place of birth:** 26.03.1935, Iasna poliana, Bourgas destr., Bulgaria.
5. **Education and Specialisation**

<table>
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<tr>
<th>Education, Specialisation</th>
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<tr>
<td>University education</td>
<td>Moscow State University</td>
<td></td>
</tr>
<tr>
<td>Specialisation – immunology</td>
<td>Central biochemical laboratory, Sofia</td>
<td></td>
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6. **Principal field of interest:** taxonomy and population genetics of fish and other hydrobionts; molecular biology.
7. **Professional employment in the institute/enterprise/company/NGO:**

<table>
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<th>Position</th>
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<tbody>
<tr>
<td></td>
<td>Institute of Fishing Resources - Varna</td>
<td>Prof, Head of Lab Ichthyology</td>
</tr>
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</table>

8. **Scientific research (up to 15 titles in the area, concerned with global change)**


Danailev, M., Terzieva, P., Dobrovolov, (in press) I. Electrophoretic observations on Cobitis taenia, Cobitis peshevi and their hybrid in some Bulgarian rivers. Acta zoologica, 51,1


9. **Participation in councils and commissions**

10. **Knowledge of languages:** Russian, French

11. **Computer literacy:** Word, Excel.

Drenovski, Ivan Jotov

1. **Scientific degrees:** Researcher, PhD
2. **Institute/enterprise/company/NGO:** Institute of Geography, Bulgarian Academy of Sciences
3. **Address:** Ac. G. Bonchev str., bl. 3, 1113 Sofia, Bulgaria
   - **Office** Tel.: +359 /2/ 979 33 66  **Fax:** +359 /2/ 70 02 04  **Email:** idren@geophys.bas.bg
   - **Home** Tel.: +359 /2/ 51 60 60
4. **Date and place of birth:** 16. 08. 1963, Pazatdjik, Bulgaria
5. **Education and Specialisation:**

<table>
<thead>
<tr>
<th>Education, Specialisation</th>
<th>University, Institute</th>
<th>Year: from - to</th>
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<tr>
<td></td>
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</tbody>
</table>
University education: Sofia University "St. Kliment Ohridski", Geography

6. **Principal field of interest**: Physical Geography, Geoecology, Geochemistry

7. **Professional employment in the institute/enterprise/company/NGO**

<table>
<thead>
<tr>
<th>Period: from - to</th>
<th>institute, enterprise, company</th>
<th>Position</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>researcher</td>
</tr>
</tbody>
</table>

8. **Scientific research (up to 15 titles in the area, concerned with global change)**


9. **Participation in councils and commissions**: no

10. **Knowledge of languages**: Russian, English

11. **Computer literacy**: Good

Gadjalska, NELLY Ilieva

1. **Scientific degrees**: Associated Professor, PhD

2. **Institute**: Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE)

3. **Address**: Sofia 1618, Bulgaria, 136 “Tzar Boris III” Blvd

   Office Tel: +359 /2/ 551 112 or 55 981/329  Fax: + 359 /2/ 554 158  Email: RIIDHE@BGCICT.ACAD.BG

   Home Tel: +359 /2/ 989 53 39  Fax: + 359 /2/ 895 520

4. **Date and place of birth**: 19 July, 1953, Plovdiv, Bulgaria

5. **Education and specialisation**:  

<table>
<thead>
<tr>
<th>Education, Specialisation</th>
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<th>Year: from- to</th>
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</thead>
<tbody>
<tr>
<td>University education - Hydraulic Engineer(Irrigation and Drainage)</td>
<td>University of Architecture, Civil Engineering and Geodesy - Sofia</td>
<td>1971-1976</td>
</tr>
<tr>
<td>Post-graduate student</td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering, Sofia.</td>
<td>1977-1979</td>
</tr>
<tr>
<td>PhD</td>
<td>University of Architecture, Civil Engineering and Geodesy - Sofia</td>
<td>1981-</td>
</tr>
<tr>
<td>Specialisation: Computer skills in software packages</td>
<td>National Training Center of Informatics</td>
<td>1983-</td>
</tr>
<tr>
<td>Specialisation: English language</td>
<td>Institute for Improving the Qualification of the Specialists of Agricultural Academy, Sofia,</td>
<td>1995-</td>
</tr>
</tbody>
</table>

6. **Principal field of interests**: Ecologically sounded water management; Environmental problems related to hydrology; Agriculture, atmospheric disposition and water pollution in field of irrigation and drainage; Irrigation water quality and its impact on the environment; Surface and sprinkler irrigation and its impact on the environment; Environmental impact assessment projects in the field of irrigation and drainage; Mathematical modelling of water quality and water pollution; Irrigation technologies and techniques; Irrigation system operation and maintenance and rehabilitation; Mathematical modelling and computer programmes for optimisation of
irrigation systems and irrigation equipment; Cost-benefit analyses of irrigation systems; Extension service for private farmers.

7. Professional employment:

<table>
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<tr>
<th>Period: from - to</th>
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<th>Position</th>
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<tbody>
<tr>
<td>1976-1977</td>
<td>Company &quot;Vodproekt&quot; Consulting Engineers, Sofia</td>
<td>Design-engineer (Surface and sprinkler irrigation)</td>
</tr>
<tr>
<td>1977-</td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering</td>
<td>Hydraulic Engineer</td>
</tr>
<tr>
<td></td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering</td>
<td>Researcher</td>
</tr>
<tr>
<td></td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering</td>
<td>Senior Researcher</td>
</tr>
</tbody>
</table>

8. Scientific research (up to 15 titles in area, concerned with global change):


Gadjalska, N., 1994. Private water users' associations under the new conditions of agricultural land use, Agricultural Reform in Central and Eastern Europe Countries, Sofia.


Gadjalska, N., B. Mladenova 1997 Ecological aspects of irrigation systems, Agricultural Science, Vol. XXXV, 4-6

9. Participation in councils and commissions

<table>
<thead>
<tr>
<th>Year: from - to</th>
<th>Name of the council or the commission</th>
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<tbody>
<tr>
<td>1996-2000</td>
<td>Member of Scientific Council of RIIDHE</td>
</tr>
<tr>
<td>1999-2000</td>
<td>Member of Steering Committee of Union for Nature Protection</td>
</tr>
</tbody>
</table>

10. Knowledge of languages: English, Spanish, Russian

11. Computer literacy: Word Processor, INTERNET

Genev, Marin Gospodinov

1. Scientific degrees: Senior Research Scientist, PhD
2. Institute/enterprise/company/NGO: National Institute of Meteorology and Hydrology, Bulgarian Academy of Sciences
3. Address: 66, "Tzarigradsko chaussee" Blvd, Sofia 1784, Bulgaria
   Office: Tel.: + 359/2/975 33 49; + 359/2/975 39 86 88(355) Fax:+ 359 /2/ 88 44 94
   Email: Marin.Genev@meteo.bg
   Home: Tel.: + 359 /2/ 75 86 27
4. Date and place of birth: 18. 08. 1939, Gabrovo, Bulgaria
5. Education and specialisation:

<table>
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<th>Education, Specialisation</th>
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<th>Year: from- to</th>
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</thead>
<tbody>
<tr>
<td>University education - Hydraulic Engineer</td>
<td>University of Architecture, Civil Engineering and Geodesy, Sofia</td>
<td>1967</td>
</tr>
<tr>
<td>Specialisation: Post graduated study</td>
<td>St. Petersburg Hydro - Meteorological Institute, Russia</td>
<td>1971 - 1973</td>
</tr>
<tr>
<td>Specialisation: International higher hydrological course</td>
<td>Moscow State Lomonosov University - UNESCO</td>
<td>1976</td>
</tr>
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</table>

6. Principal field of interest: Hydrology, flow variability and changes of climate, antropogenic changes of the flow, water resources, forecasting of the seasonal and annual runoff, complex investigation of the big artificial lakes, mathematical models, descriptive analysis of variable rows

7. Professional employment in the institute/enterprise/company / NGO

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<th>Position</th>
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<tbody>
<tr>
<td>1967 - 1976</td>
<td>National Institute of Meteorology and Hydrology</td>
<td>Scientific researcher, Hydrologist at NIMH</td>
</tr>
<tr>
<td>1977 - 1980</td>
<td>Sofia University</td>
<td>Lecturer</td>
</tr>
<tr>
<td>1984</td>
<td>National Institute of Meteorology and Hydrology</td>
<td>Senior scientific Researcher in Hydrology</td>
</tr>
<tr>
<td>1986 - 1989</td>
<td>National Institute of Meteorology and Hydrology</td>
<td>Scientific Secretary</td>
</tr>
<tr>
<td>1999</td>
<td>National Institute of Meteorology and Hydrology</td>
<td>Chief of the section “Hydrology”</td>
</tr>
</tbody>
</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)
Genev, M., 1974. Study of the link between the river wetness in Bulgaria and the indexes of the Solar activity and the atmosphere circularion. -Hydrology and Meteorology, ed. 6, p. 53 - 60


9. Participation in councils and commissions

<table>
<thead>
<tr>
<th>Year: from - to</th>
<th>Name of the council or the commission</th>
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<tr>
<td>1975</td>
<td>National Committee of the International Hydrology Programme</td>
</tr>
<tr>
<td>1985 - 1989</td>
<td>Scientific Council of NIMH</td>
</tr>
<tr>
<td>1987</td>
<td>Expert at the Ministry of educational science</td>
</tr>
<tr>
<td>1999</td>
<td>Bulgarian Representative at the Hydrology Commission of WMO</td>
</tr>
</tbody>
</table>

10. Knowledge of languages: Russian, English

11. Computer literacy: Mikrosoft, Borland Offic, programming etc.

Georgieva, Boianka Marinova

1. Scientific degrees:

2. Institute/enterprise/company/NGO: Institute of Fishing Resources - Varna, Bulgaria

3. Address: P.O. Box 72, 4, “Primorski” Blvd., Varna 9000, Bulgaria

   Office: Tel.: +359 /52/ 25 78 76  Fax: +359 /52/ 25 78 76

   Email: ifishres@varna.ttm.bg

   Home: Tel.: +359 /52/ 44 68 37

4. Date and place of birth: 19.06.1945, Mirovul, Shumen destr. Bulgaria

5. Education and Specialisation:

   Education, Specialisation | University, Institute | Year: from - to
   University education | University, Biology Fac., Dept. Hydrobiology, Sofia |

6. Principal field of interest: zooplankton, ecology.

7. Professional employment in the institute/enterprise/company/NGO:

   Period: from - to | institute, enterprise, company | Position
   Institute of Fishing Resources - | biologist in the lab. Hydrobiology |
8. Scientific research (up to 15 titles in the area, concerned with global change)

9. Participation in councils and commissions

Gergov, George Ivanov

1. Scientific degrees: Prof., Dr.Sc., Eng.
2. Institute/enterprise/company/NGO: National Institute of Meteorology and Hydrology, Sofia, Bulgaria
3. Address: National Instituite of Meteorology and Hydrology, Tzarigradski Blvd, 66, Sofia 1784, Bulgaria
Office Tel.: +359 /2/ 975 3986 Fax: Email: Georgi.Gergov@meteo.bg
Home: Tel.: +359 /2/ 727 792
4. Date and place of birth: 30.03.1938, Sofia, Bulgaria
5. Education and specialisation:

<table>
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<th>Education, Specialisation</th>
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<tbody>
<tr>
<td>graduated Hydroengineering</td>
<td>University of Civil Engineering, Geodezy and Architecture in Sofia</td>
<td>1962</td>
</tr>
<tr>
<td>Ms Sc Degree in Hydroengineering</td>
<td>Univ. of Civil Engineering, Geodezy and Architecture in, Sofia</td>
<td></td>
</tr>
<tr>
<td>Course on Hydrology</td>
<td>Univ. of Padova, Italy</td>
<td>1970</td>
</tr>
<tr>
<td>Post graduate training in Sediment transport</td>
<td>Colorado State University, Fort Collins, and Iowa Institute of Hydraulic Research, USA</td>
<td>1980</td>
</tr>
<tr>
<td>Ph Dr in Hydrology</td>
<td>State Institute of Hydrology, St. Peterburg, Russia</td>
<td>1974</td>
</tr>
<tr>
<td>Senior Research Scientist in Hydrology</td>
<td>National Institute of Meteorology and Hydrology, Sofia</td>
<td>1975</td>
</tr>
<tr>
<td>Dr Sc in Hydrology</td>
<td>Univ. of Civil Engineering, Geodezy and Architecture in, Sofia</td>
<td>1995</td>
</tr>
<tr>
<td>Professor in Hydrology</td>
<td>National Institute of Meteorology and Hydrology, Sofia</td>
<td>1998</td>
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</table>

6. Principal field of interest: Hydrology, water resources; sediment transport, fluvial processes; sediment particles features; hydrometry; limnology; river environment; anthropogenic impact assessments; treatment of data, remote sensing
7. Professional employment in the institute/enterprise/company/NGO

<table>
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<th>Period: from- to</th>
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<th>Position</th>
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<tbody>
<tr>
<td>1982-1986</td>
<td>National Institute of Meteorology and Hydrology</td>
<td>Scientific Secretary</td>
</tr>
<tr>
<td>1986-1990</td>
<td>National Institute of Meteorology and Hydrology</td>
<td>Deputy Director</td>
</tr>
<tr>
<td>1991-</td>
<td>National Institute of Meteorology and Hydrology</td>
<td>Head of the River Sediment Transport. and Fluvial Processes Division</td>
</tr>
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</table>
8. Scientific research (up to 15 titles in the area, concerned with global change).


5. Participation in councils and commissions

<table>
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<tr>
<th>Year: from - to</th>
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<tbody>
<tr>
<td>1980-1994</td>
<td>Scientific council of the National Institute of Meteorology and Hydrology, Sofia</td>
</tr>
<tr>
<td>1982 -</td>
<td>Union of Bulgarian Scientists</td>
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<tr>
<td>1992-</td>
<td>International Association on Hydrological Science (IAHS)</td>
</tr>
<tr>
<td>1995-</td>
<td>British Hydrological Society</td>
</tr>
<tr>
<td>1976-1984</td>
<td>National Committee of International Hydrology Programme</td>
</tr>
<tr>
<td>1997-</td>
<td>New York Academy of Sciences</td>
</tr>
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</table>

7. Knowledge of languages: English, and Russian

8. Computer literacy:-
Hristov, Todor Nikolov

1. Scientific degrees: Prof. PhD
2. Institute/enterprise/company/NGO: National Co-ordination Center for global Change, Bulgarian Academy of Sciences
3. Address: “Acad. G. Bonchev” Str., Bl. 1, Sofia 1113, Bulgaria
   Office: Tel.: +359 /2/ 971 45 21   Fax: +359 /2/ 72 25 77
   Email: Hristov@bgcict.acad.bg
   Home: Tel.: +359 /2/ 72 80 49   Fax.: +359 /2/ 737 995
4. Date and place of birth: 26.04.1932, Sofia, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education</td>
<td>University of Architecture, Civil Eng. and Geodesy, Sofia. Civil Hydroengineering</td>
<td>1952-1958</td>
</tr>
<tr>
<td>PhD</td>
<td>University of Architecture, Civil Engineering and Geodesy, Sofia.</td>
<td>1968-1973</td>
</tr>
<tr>
<td>Spacialisation - Hydrotechnics</td>
<td>ASTEF - France</td>
<td>1969-</td>
</tr>
</tbody>
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6. Principal field of interest: Optimal complex and rational utilisation, management, and operation of the water resources, Ecological aspects of the water resources utilisation, GIS and Information and Expert systems for water management.
7. Professional employment in the institute/enterprise/company/NGO

<table>
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<tr>
<td>1958-1961</td>
<td>Hydrostgroy: Building of Dam “Topolnitza”</td>
<td>Chef engineer</td>
</tr>
<tr>
<td>1961-1962</td>
<td>Hydrostgroy: Building of the irrigation system “Pasardjik”</td>
<td>Chef engineer -</td>
</tr>
<tr>
<td>1962-1978</td>
<td>Inst. of Water Problems, Bulgarian Academy of Sciences</td>
<td>Research scientist</td>
</tr>
<tr>
<td>1978-1983</td>
<td>Inst. of Water Problems, Bulgarian Academy of Sciences</td>
<td>Senior Research Scientist-Head of section &quot;</td>
</tr>
<tr>
<td>1983-1988</td>
<td>Inst. of Water Problems, Bulgarian Academy of Sciences</td>
<td>Senior Research Scientist-Scientific secretary</td>
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<tr>
<td>1988-1989</td>
<td>Inst. of Water Problems, Bulgarian Academy of Sciences</td>
<td>Professor. - Scientific secretary</td>
</tr>
<tr>
<td>1989-1993</td>
<td>Inst. of Water Problems, Bulgarian Academy of Sciences</td>
<td>Professor, Deputy director</td>
</tr>
<tr>
<td>1993-1995</td>
<td>Inst. of Water Problems, Bulgarian Academy of Sciences</td>
<td>Professor, Director</td>
</tr>
<tr>
<td>1995-1999</td>
<td>Inst. of Water Problems, Bulgarian Academy of Sciences</td>
<td>Professor, Head of the section</td>
</tr>
<tr>
<td>2000-2000</td>
<td>Inst. of Water Problems, Bulgarian Academy of Sciences</td>
<td>Visiting Professor</td>
</tr>
<tr>
<td>1997-2000</td>
<td>National Co-ordination Center for global Change</td>
<td>Visiting Professor</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)

9. Participation in councils and commissions

<table>
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<tr>
<td>1988-1989</td>
<td>Scientific Council of the Laboratory of Phisical-Chimical Mechanics</td>
</tr>
<tr>
<td>1988-1989</td>
<td>Scientific Council of the Technical Sciences Department of the Bulgarian Academy of Sciences</td>
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<tr>
<td>1994-</td>
<td>Editing Committee of the Journal “Technical Ideas”</td>
</tr>
<tr>
<td>1995 - 1997</td>
<td>Editing Committee of the Journal &quot;Water Problems&quot;</td>
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<td>1997 -</td>
<td>Council of National Development by the President of the Republic of Bulgaria</td>
</tr>
</tbody>
</table>

10. Knowledge of languages: French, English, Russian
Iliev, Iliya Petrov

1. Scientific degrees: Assoc. Prof., PhD
2. Institute/enterprise/company/NGO: Sofia University “St. Cl. Okhridcki ”, Faculty of Primary and Preschool Education
3. Address: 69 A, “Shipchensky Prochod”St., Sofia 1574, Bulgaria
   Office Tel.: +359 /2/ 73 54 258 Fax: Email: iliev@fnpp.unisofia.bg
   Home: Tel.: +359 /2/ 73 05 78
4. Date and place of birth: 22.07.1944, Gorna Mitropolia dist. Pleven, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University - Geography, History</td>
<td>Sofia University “St. Cl. Okhridcki ”, Faculty of Geography and Geology</td>
<td>1971</td>
</tr>
<tr>
<td>PhD</td>
<td></td>
<td>1995</td>
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</table>

6. Principal field of interest: Environment Protection from pollution caused by solid domestic wastes, landscape protection, formation and development of settlement agglomerations and their impact on the natural environment, assessment of man-induced transformation, assessment and prognosis of the land resources.

7. Professional employment in the institute/enterprise/company/NGO

<table>
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<th>Year: from - to</th>
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<th>Position</th>
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<tr>
<td>1992</td>
<td>Sofia University “St. Cl. Okhridcki ”, Faculty of Primary and Preschool Education</td>
<td>Chief Assistant</td>
</tr>
<tr>
<td>1997</td>
<td>Sofia University “St. Cl. Okhridcki ”, Faculty of Primary and Preschool Education</td>
<td>Assoc. Prof.</td>
</tr>
<tr>
<td>1996</td>
<td>Ministry of Environment</td>
<td>lisenced expert on EIA (Environmental Impact Assessment)</td>
</tr>
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</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)


Uzunov, B., I. Iliev, 1980. On some principles of interaction between the global monitoring system and the national and regional systems for observations and information on the environmental pollution. In: Complex global Monitoring of the Environmental Pollution, Leningrad


***, 1988. Prognosis on the environmental changes and the possible effects on our development for the period 1995- 2010. S.


Ilieva, M., I. Iliev, 1995. Changes in the ownership and farmland use in Bulgaria during the transition to market economy., – Problems of Geography, No 4

Iliev, I., 1996. Umweltgeographische Probleme der Grossstädte in Bulgarien. – Südosteuropa Aktuell 22, Munchen

Iliev, I., M. Ilieva, Assessment of man-induced transformations of Bulgaria’s territory. – In: Anniversary of Geography at Sofia University, S.


9. Participation in councils and commissions

<table>
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<tr>
<th>Year: from - to</th>
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</table>

10. Knowledge of languages: Russian, German

11. Computer literacy: Word 6

Ilieva, Margarita Milanova

1. Scientific degrees: Assoc. Prof., PhD

2. Institute/enterprise/company/NGO: Institute of Geography-Bulgarian Academy of Sciences

3. Address: “G. Bonchev” str., bl. 3, Sofia 1113, Bulgaria

   Office: Tel.: +359 /2/ 979-33-69   Fax: +359 /2/ 70-02-04   Email: milieva@geophys.bas.bg

   Home:       Tel.: +359 /2/ 73-05-78

4. Date and place of birth: 11.08.1947, Sofia, Bulgaria

5. Education and Specialisation:

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<th>Education, Specialisation</th>
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<th>Year: from - to</th>
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<tbody>
<tr>
<td>University education</td>
<td>Sofia University “St. Cl. Okhridcki ”. Faculty of Geography and Geology</td>
<td>1969</td>
</tr>
<tr>
<td>Ph.D</td>
<td></td>
<td>1977</td>
</tr>
<tr>
<td>Specialisation:</td>
<td>Institute of Geography and Spatial Organisation, Warsaw</td>
<td>1979</td>
</tr>
</tbody>
</table>

6. Principal field of interest: Economic geography – spatial organisation of economy, regionalisation, transformation of spatial systems, land use and land protection

7. Professional employment in the institute/enterprise/company/NGO

<table>
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<th>Period: from - to</th>
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<tr>
<td>1977-1991</td>
<td>Institute of Geography Bulgarian Academy of Sciences</td>
<td>Researcher –</td>
</tr>
<tr>
<td>1991</td>
<td>Institute of Geography Bulgarian Academy of Sciences</td>
<td>Assoc. Prof.</td>
</tr>
<tr>
<td></td>
<td>jurnal “Problems of Geography”</td>
<td>Deputy editor</td>
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</table>
8. Scientific research (up to 15 titles in the area, concerned with global change)


Ilieva, M., I. Iliev, 1995. Changes in the ownership and farmland use in Bulgaria during the transition to market economy. – Problems of Geography, 4


9. Participation in councils and commissions

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<tr>
<td>1991-2000</td>
<td>Scientific Council of Institute of Geography BAS</td>
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<td>1994-1999</td>
<td>Specialised Scientific Council on Geographical Sciences</td>
</tr>
<tr>
<td>1999-</td>
<td>Scientific Commission &quot;Earth Sciences&quot; at the Supreme Attestation Commission</td>
</tr>
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</table>

10. Knowledge of languages: Russian, Polish, English

11. Computer literacy: Word 6, Word 7

---

Ivancheva, Ludmila Evlogieva

1. Scientific degrees: PhD

2. Institute/enterprise/company/NGO: Technical University, Sofia, Measurement and Control Technics

3. Address: 4, Serdika St., Sofia 1000, Bulgaria

   Office  | Tel.: +359 /2/ 88-38-87  | Fax: +359 /2/ 980-47-57  | Email: Livancheva@yahoo.com

               | Home:  | Tel.: +359 /2/ 978- 87-36 |

4. Date and place of birth: 23.19. 1959, Bulgaria

5. Education and Specialisation:

<table>
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<th>Year: from - to</th>
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<tbody>
<tr>
<td>PhD</td>
<td>Technical University, Sofia, Measurement and Control Technics</td>
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6. Principal field of interest: scientometrics, information science, mathematical modelling, environmental protection

7. Professional employment in the institute/enterprise/company/NGO

<table>
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<th>Position:</th>
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<tbody>
<tr>
<td>researcher</td>
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</tr>
</tbody>
</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)
9. Participation in councils and commissions
10. Knowledge of languages: German, English, Russian
11. Computer literacy: Microsoft Office 97, Statistica, SPSS

Ivanova, Petia Pavlova

1. Scientific degrees: Research Associate
2. Institute/enterprise/company/NGO: Institute of Fishing Resources
3. Address: 4, “Primorski” Blvd, Varna 9000, Bulgaria
   Office Tel.: +359 /52/ 25 78 76    Fax: +359 /52/ 25 78 76
   Email: ifr@abcis.bg
   Home: Tel.: +359 /52/ 82 96 62
4. Date and place of birth: 17.10.1969, Varna, Bulgaria
5. Education and Specialisation:

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<th>Education and Specialisation</th>
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<tr>
<td>graduated Hydroengineering</td>
<td>University of Civil Engineering, Geodesy and Architecture in Sofia</td>
<td>1962</td>
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<tr>
<td>Master’s degree</td>
<td>Dept. of Hydrobiology of Sofia State University, Bulgaria</td>
<td></td>
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7. Professional employment in the institute/enterprise/company/NGO:

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<th>Position</th>
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<tbody>
<tr>
<td>1992 - 1994</td>
<td>Lab. of Hydrobiology, Institute of Fishing Resources</td>
<td>Biologist</td>
</tr>
<tr>
<td>1994 - to present</td>
<td>Lab. of Hydrobiology, Institute of Fishing Resources</td>
<td>Research Associate</td>
</tr>
</tbody>
</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)
10. Knowledge of languages: German, English and Russian.
Ivanova Roumiana Zdravkova

1. Scientific degrees:
2. Institute/enterprise/company/NGO: National Statistical Institute of Bulgaria
3. Address: 2, “P. Volov” St. Sofia 1504, Bulgaria
   Office: Tel.: +359 /2/ 985 72 637    Email: Rivanova@nsi.bg
Jordanova, Marina Dimitrova

1. Scientific degrees: Associate Professor, PhD
2. Institute/enterprise/company/NGO: Institute of Geography - BAS
3. Address: “Georgi Bonchev” St, Bl. 3, Sofia 1113, Bulgaria
   Office: Tel.: +359 /2/ 979 33 70  Fax: +359 /2/ 70 02 04  Email: mar.yord@mbox.bol.bg
4. Date and place of birth: 09.03.1939, Silistra, Bulgaria
5. Education and Specialisation:

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<td>University education-Geography</td>
<td>University &quot;St. Kliment Ohridski&quot;, Sofia</td>
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</tr>
<tr>
<td>PhD</td>
<td>Hydrology</td>
<td>1971</td>
</tr>
<tr>
<td></td>
<td>Hydrology</td>
<td>1977</td>
</tr>
<tr>
<td></td>
<td>Hydrology</td>
<td>1988</td>
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6. Principal field of interest: Hydrology, Geoecology, Physical Geography
7. Professional employment in the institute/enterprise/company/NGO

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<tr>
<td></td>
<td>Researcher</td>
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</tr>
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<td></td>
<td>Editor of “ Problems of Geography”</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)


9. Participation in councils and commissions

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1993- | Specialised Scientific Council of Geographic Sciences – SCC
1984- | Scientific Council of the Institute of Geography

10. Knowledge of languages: Russian, English
11. Computer literacy: none

Kalcheva, Spaska Georgieva

1. Scientific degrees: PhD, Ass. Prof.
2. Institute: Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE)
3. Address: 136, “Tzar Boris III” Blv, Sofia 1618, Bulgaria
   Office: Tel. +359 /2/ 56 30 01 Fax: +359 /2/ 55 41 58 Email: RIIDHE@bgcict.acad.bg
   Home: Tel: (+359 2) 26 54 66
4. Date and place of birth: 10.08.1951, Velingrad, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education-Agronomist</td>
<td>Higher Institute of Agriculture - Plovdiv</td>
<td>1974-</td>
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<tr>
<td>PhD- High Ground Water Table Effect on Evapotranspiration</td>
<td>Institute of Water problems-BAS, Sofia</td>
<td>1986-1991</td>
</tr>
<tr>
<td>Specialisation</td>
<td>NATO-Advanced Study Institute / ASI/ in Antalya, Turkiye</td>
<td>1995-</td>
</tr>
<tr>
<td>Specialisation</td>
<td>France, Departement de Bioclimatologie, Thiverval - Grignon</td>
<td>1996</td>
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6. Principal field of interest: Irrigation scheduling; Evapotranspiration; High Ground Water Table; Relationship "Water - yield"; Ecological Problems Related to Irrigation and Drainage.

7. Professional employment:

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<tbody>
<tr>
<td>1975 - 1976</td>
<td>APK “Senovo”</td>
<td>Agronomist</td>
</tr>
<tr>
<td>1976 - 1979</td>
<td>COS - Rasgrad</td>
<td>researcher</td>
</tr>
<tr>
<td>1979 - 1991</td>
<td>RIIDHE, Sofia</td>
<td>Senior Scientist</td>
</tr>
<tr>
<td>1998 - to now</td>
<td>RIIDHE, Sofia</td>
<td>Ass. Prof.</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)
   Kalcheva Sp., 1996 - High Ground Water Table Effect on Evapotranspiration; 16th Dranage Workshop on Drainage and the Enviroment, Ljubljana, Slovenia, April, pp. 382 - 386.
   Kalcheva Sp., 1997 - Optimum Profundity of High Ground Water Table for Cultivation of Grain and Vegetable Crops, 50 Year: from - tos, COS - Pazardjik, Agricultural Science N 6, pp. 13-15


9. Participation in councils and commissions
10. Knowledge of languages: Russian, English, French
11. Computer literacy: - DOS, Word

Karagiozova, Tzviatka Ivanova

2. Institute/enterprise/company/NGO: National Institute of Meteorology and Hydrology, Sofia, Bulgaria
3. Address: 66, “Tzarigradski” Blvd. Sofia 1784, Bulgaria
   Office: Tel.: +359 /2/ 97539 86, ext. 201 Fax: +359 /2/ 88 44 94 Email: Georgi.Gergov@meteo.bg
   Home Tel.: +359 /2/ 66 30 58
4. Date and place of birth: 31.07.1951, Sofia, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education</td>
<td>University of Civil Engineering, Geodesy and Architecture, Sofia</td>
<td>1974</td>
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<tr>
<td>PhD</td>
<td>University of Civil Engineering, Geodesy and Architecture in Sofia</td>
<td>1983</td>
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6. Principal field of interest: Development and application of methods for sediment transport, fluvial processes and limnology studies, sediment features, field measurement, ecological assessments, river abiotica, treatment of data and hydrological assessment, regime of river water temperature
7. Professional employment in the institute/enterprise/company/NGO

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<tr>
<td>1983-1989</td>
<td>Glavproject, Sofia</td>
<td>Scientific Researcher</td>
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<td>1992-</td>
<td>National Institute of Meteorology and Hydrology</td>
<td>Scientific Researcher</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)

9. Participation in councils and commissions
10. Knowledge of languages: English, Russian
11. Computer literacy

Knight, C. Gregory

1. Scientific degrees: Prof. Dr.
2. Institute/enterprise/company/NGO:
3. Address: St. Department of Geography, 302 Walker Building, The Pennsylvania State University, University Park, PA 16802
   Office Tel.: 814/ 863 8571 Fax: 814/ 863 7943 Email: cgk@psu.edu
   Home Tel.: 4.
4. Date and place of birth:
5. Education and Specialisation:
6. Principal field of interest:
7. Professional employment in the institute/enterprise/company/NGO
8. Scientific research (up to 15 titles in the area, concerned with global change)


9. Participation in councils and commissions

10. Knowledge of languages:

11. Computer literacy

Kolarov, Peter Poldiev

1. Scientific degrees: Prof., Dr.Sc.
2. Institute/enterprise/company/NGO: Institute of Fishing Resources - Varna
3. Address: P.O. Box 72, 4, Primorski Bd., Varna 9000, Bulgaria
   Office Tel.: +359 /52/ 257876 Fax: +359 /5/2 257876
   Email:ifr@abcis.bg; ifishres@varna.ttm.bg
   Home: Tel.: +359 /52/ 22 38 66
4. Date and place of birth: 16.02.1931, Vidin, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education - ichthyology</td>
<td>University of Sofia, Dept. of hydrobiology</td>
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7. Professional employment in the institute/enterprise/company/NGO: Director of IFR-Varna; Prof. In Sofia University.
8. Scientific research (up to 15 titles in the area, concerned with global change)
9. Participation in councils and commissions
Kolev, Boris Todorov

1. Scientific degrees: Associate Professor, PhD
2. Institute/enterprise/company/NGO: Institute of Geography
3. Address: “Acad. G. Bonchev” St., Block 3, Sofia 1113, Bulgaria
   Office Tel.: +359 /2/ 70 02 53, +359 /2/ 979 33 68   Fax: +359 /2/ 70 02 04
   Email: bkolev@bas.bg
   Home: Tel.: + 359 /2/ 52 80 37
4. Date and place of birth: 05.06.1948, Sofia, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education</td>
<td>Sofia University &quot;St. Kliment Ohridski&quot;</td>
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<tr>
<td>Specialisation</td>
<td>Russia</td>
<td></td>
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<tr>
<td>Specialisation</td>
<td>Czechoslovakia</td>
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</table>
6. Principal field of interest: regional development, agroecology, geography of agriculture
7. Professional employment in the institute/enterprise/company/NGO
   Year: from - to
   Institute of Geography
   Position
8. Scientific research (up to 15 titles in the area, concerned with global change)
9. Participation in councils and commissions
   Year: from - to
   Name of the council or the commission
10. Knowledge of languages: Russian, French, English
11. Computer literacy: none
Lazarov, Assen Lazarov

1. **Scientific degrees:** Senior Research Associate, PhD

2. **Institute/enterprise/company/NGO:** “N. Poushkarov Research Institute for Soil Science and Agroecology

3. **Address:** 7, Shosse Bankya, Sofia 1080, Bulgaria

   **Office:** Tel.: ++359 /2/ 240 345      **Fax:** ++359 /2/ 248 937      **Email:**

   **Home:** Tel.: ++359 /2/ 255 103

4. **Date and place of birth:** 01.04.1943, Belitza, Bulgaria

5. **Education and Specialisation:**

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<th>Education and Specialisation</th>
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<tr>
<td>University education</td>
<td>University of Architecture, Civil Engineering and Geodesy</td>
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6. **Principal field of interest:** Soil Erosion, Land-use planning and conservation of sloping lands, Land-dividing, Land-restitution, Cartography, Photogrametry, Cadastre.

7. **Professional employment in the institute/enterprise/company/NGO**

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<th>Position</th>
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<tr>
<td></td>
<td>N. Poushkarov Research Institute for Soil Science and Agroecology</td>
<td>Head of Soil erosion department</td>
</tr>
<tr>
<td></td>
<td>N. Poushkarov Research Institute for Soil Science and Agroecology</td>
<td>President of the General Assembly of the Scientists</td>
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8. **Scientific research (up to 15 titles in the area, concerned with global change):**


9. **Participation in councils and commissions**

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<td>1995 -</td>
<td>Scientific Council of “N. Poushkarov” RISSA</td>
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10. **Knowledge of languages:** English, Russian

11. **Computer literacy:** MS Word, MS Excel

---

Mastikova, Stoyanka Lukova

1. **Scientific degrees:**

2. **Institute/enterprise/company/NGO:** National Statistical Institute of Bulgaria

3. **Address:** 2, “P. Volov” St. Sofia 1504, Bulgaria

   **Office:** Tel.: +359 /2/ 985 72 637      **Fax:** Email: Smastikova@nsi.bg

   **Home:** Tel.: +359 /2/ 978 52 40

4. **Date and place of birth:** 18.11.1958, Sofia, Bulgaria

5. **Education and Specialisation:**

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<tr>
<td>Statistics</td>
<td>Higher Institute of Economics “ Karl Marx”</td>
<td>1977-1983</td>
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6. **Principal field of interest:** Environmental Statistics

7. **Professional employment in the institute/enterprise/company/NGO**

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<th>Position</th>
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<tr>
<td>1988–1990</td>
<td>National Statistical Institute</td>
<td>specialist</td>
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Mateeva, Zoya Spasova

1. Scientific degrees: researcher, PhD
2. Institute/enterprise/company/NGO: Institute of Geography - Bulgarian Academy of Sciences
3. Address: “Acad. G. Bonchev” St, Bl. 3, Sofia 1113, Bulgaria
   Office Tel.: 359 /2/ 979 39 43 Fax: 359 /2/ 70 02 04 Email: zoya@bgcict.acad.bg
4. Date and place of birth: 20.10.1957, Lom, Bulgaria

5. Education and Specialisation:

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<tr>
<td>University education -</td>
<td>Sofia University &quot;St. Kliment Ohridski&quot;, Dept. of Geology and Geography</td>
<td>1988, 1989,</td>
</tr>
<tr>
<td>geography</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bioclimatology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialisation - human</td>
<td>Institute of Geography and Spatial Organisation at the Polish Academy of Sciences, Warsaw</td>
<td>1997</td>
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<tr>
<td>bioclimatology</td>
<td></td>
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6. Principal field of interest: climatology, bioclimatology, ecological problems related to the air

7. Professional employment in the institute/enterprise/company/NGO:
   researcher, expert on "atmospheric air" (licence N794/protocol N24/8.10.1997)

8. Scientific research (up to 15 titles in the area, concerned with global change)
9. Participation in councils and commissions
10. Knowledge of languages: Russian, English
11. Computer literacy: Word'2000; Excel; g.surfef; statistica, etc.
Mihneva, Vesselina Vassileva

1. Scientific degrees: Research Ass.
2. Institute/enterprise/company/NGO: Institute of Fishing Resources - Varna
3. Address: P.O. Box 72, 4, “Primorski” Blvd., Varna 9000, Bulgaria
   Office     Tel.: +359 /52/ 25 78 76       Fax: +359 /52/ 25 78 76
   Email: ifishres@varna.ttm.bg
   Home       Tel.: +359 /5/2 22 67 63
4. Date and place of birth: 01.11.1967, Varna, Bulgaria.
5. Education and Specialisation:

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<tr>
<td>University education</td>
<td>Shoumen University, Dept. of Biology, speciality: Biology and Chemistry</td>
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6. Principal field of interest: zooplankton, biodiversity, ecology.
7. Professional employment in the institute/enterprise/company/NGO:

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<tr>
<td></td>
<td>Institute of Fishing Resources - Varna</td>
<td>Research Ass. in lab. Hydrobiology</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)
9. Participation in councils and commissions
10. Knowledge of languages: Russian, English, German
Mikhailov, Konstantin Rashev

2. Institute/enterprise/company/NGO: Institute of Fishing Resources - Varna
3. Address: P.O. Box 72, 4, “Primorski” Blvd., Varna 9000, Bulgaria
   Office Tel.: +359 /52/ 25 78 76  Fax: +359 /52/ 25 78 76  Email: ifishres@varna.ttm.bg
   Home: Tel.: +359 /52/ 60 97 60
4. Date and place of birth: 15.07.1952, Karnobat, Bulgaria
5. Education and Specialisation:

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<td>University education</td>
<td>Sofia State University, molecular biology</td>
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<tr>
<td>Specialisation – reproduction of fish</td>
<td>Moscow State University</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)
9. Participation in councils and commissions:

Mladenova-Steffanova, Bojidara Petrova

1. Scientific degrees: Assoc. Prof., PhD
2. Institute/enterprise/company/NGO: Research Institute for Irrigation, Drainage and Hydraulic Engineering
3. Address: 136, “Tzar Boris III” blvd., Sofia, Bulgaria
   Office: Tel.: +359 /2/ 55 981, app. 235  Fax: +359 /2/ 554 158  Email: RIIDHE@bgcict.acad.bg
   Home: Tel.: +359 /2/ 315 236
4. Date and place of birth: 13.07.1950, Sofia, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education-Agronomist</td>
<td>Agricultural Academy, Faculty of Agriculture</td>
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<tr>
<td>PhD</td>
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</table>
6. **Principal field of interest:** Optimisation of irrigation scheduling under water scarcity conditions; Heavy metal soil and groundwater pollution by irrigation treatment.

7. **Professional employment in the institutes/enterprises/companies/NGO**

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<th>Position</th>
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<tr>
<td></td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering</td>
<td>Scientist researcher, Head of Department</td>
</tr>
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8. **Scientific research (up to 15 titles in the area, concerned with global change)**


9. **Participation in councils and commissions**

10. **Knowledge of languages:** English, Russian

11. **Computer literacy:** Microsoft Windows 98; Word, Excel
Nikolova, Mariana Kostadinova

1. Scientific degrees: Researcher, PhD
2. Institute/enterprise/company/NGO: Institute of Geography
3. Address: “Acad. G. Bonchev” St., block 3, Sofia 1113, Bulgaria
   Office Tel.: +359 /2/ 979 33 74  Fax: +359 /2/ 70 02 04
   Email: mn@bgcict.acad.bg
4. Date and place of birth: 26.03.1957, Sofia, Bulgaria
5. Education and Specialisation:
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<tr>
<td>University education</td>
<td>Sofia University &quot;St. Kliment Ohridski“, Department of Geology and Geography</td>
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6. Principal field of interest: climatology, hazardous natural phenomena, environmental risk assessment and management, ecological aspects of climate change and environmental qualities
7. Professional employment in the institute/enterprise/company/NGO
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<th>Position</th>
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<tr>
<td></td>
<td>Institute of Geography, Bulgarian Academy of Sciences</td>
<td>Researcher. in climatology and agroclimatology</td>
</tr>
<tr>
<td>Shoumen University &quot;Konstantin Preslavski&quot;</td>
<td>lecture</td>
<td></td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)
   Nikolova, M. (1999), Tornado Hazard in Bulgaria, DOMODIS workshop - IDNDR Project on Mountain Disasters, Bucharest, September 30 - October 2
9. Participation in councils and commissions:
10. Knowledge of languages: English, Russian
11. Computer literacy: Office 97

Nikolova, Nina Vankova

1. Scientific degrees: PhD
3. Address: 2, “Narodni Buditeli” Str., “Svoboda”, Sofia, Bulgaria
   Office Tel.: +359 /2/ 38-31-43  Email: nikolova_nina@hotmail.com
4. Date and place of birth: 20.01.1968, Bulgaria
5. Education and Specialisation:
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<tr>
<td>University education</td>
<td>Sofia University “St.Kl.Ohridski” – Geography</td>
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</tr>
<tr>
<td>PhD in Climatology</td>
<td>Meteorological Research Institute, Climate Research Department, Japan</td>
<td></td>
</tr>
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6. Principal field of interest: global Climate Change
7. Professional employment in the institute/enterprise/company/NGO
8. Scientific research (up to 15 titles in the area, concerned with global change)
9. Participation in councils and commissions:
10. Knowledge of languages: English, Russian, Japanese

Ouzounova, Sonia Todorova

1. Scientific degrees: Research associate
2. Institute/enterprise/company/NGO: Institute of Fishing Resources
3. Address: 4, “Primorski” Blvd, Varna 9000, Bulgaria
   Office Tel.: +359 /52/ 25 78 76 Fax: +359 52 257876
   Email: ifr@abcis.bg
   Home: Tel.: +359 /52/ 82 96 62
   Email: sonja_ouz@yahoo.com
4. Date and place of birth: 18.07. 1963, Varna, Bulgaria
5. Education and Specialisation:

<table>
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<th>Education and Specialisation</th>
<th>University, Institute</th>
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<tbody>
<tr>
<td>University education</td>
<td>Dept. of Hydrobiology of Sofia State University,</td>
<td>1988</td>
</tr>
<tr>
<td>expert in environmental impact assessment, environmental audit and integrated coastal management,</td>
<td>Phare-TACIS</td>
<td>1995</td>
</tr>
</tbody>
</table>

6. Principal field of interest: Researches on biodiversity and dynamics of macrozoobenthos. Evaluation of the local effects of pollution on the benthic societies.
7. Professional employment in the institute/enterprise/company/NGO:

<table>
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<tr>
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<th>Position</th>
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<tbody>
<tr>
<td>1988</td>
<td>Institute of Fishing Resources</td>
<td>Biologist – Lab. of Hydrobiology</td>
</tr>
<tr>
<td>1994-to present</td>
<td>Institute of Fishing Resources</td>
<td>Research Associate - Lab. of Hydrobiology</td>
</tr>
</tbody>
</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)

Stoykov S., S. Ouzounova (in press). Dynamics of macrozoobenthos in the southern Bulgarian Black Sea coastal and open-sea areas.: Journal "MEDITERRANEAN MARINE SCIENCE"
9. Participation in councils and commissions
Penkov, Ivan Todorov

1. **Scientific degrees:** Assist. Prof., PhD
2. **Institute/enterprise/company/NGO:** Sofia University St. Kliment Ohridski, Faculty of Geology and Geography
3. **Address:** 15, “Tsar Osvoboditel” Blvd. 1504 Sofia, Bulgaria
   - **Office Tel.:** +359/2/44 67 87, 9308(217) **Fax:** (3592)+359/2/44 67 87 **Email:** zlatunova@gea.uni-sofia.bg
   - **Home: Tel.:** +359 /2/ 56 22 15
4. **Date and place of birth:** 27.12. 1955. Sofia, Bulgaria
5. **Education and Specialisation:**

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<tr>
<td>University education</td>
<td>Sofia University “St. Kliment Ohridski”, Faculty of Geology and Geography</td>
<td></td>
</tr>
</tbody>
</table>

6. **Principal field of interest:** Precipitation – hydroclimatogly, runoff dependence, water resources
7. **Professional employment in the institute/enterprise/company/NGO:** lecture, seminars and exercise by hydrology

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<td></td>
<td>Sofia University “St. Kliment Ohridski”</td>
<td>Assist. Prof</td>
</tr>
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</table>

8. **Scientific research (up to 15 titles in the area, concerned with global change)**
9. **Participation in councils and commissions**
10. **Knowledge of languages:** French, Russian
11. **Computer literacy:** very well

Petkov, Plamen Danev

1. **Scientific degrees:** Ass. Prof.PhD,
2. **Institute:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE)
3. **Address:** 136, “Tzar Boris III” Blvd., Sofia 1618, Bulgaria
   - **Office** Tel.: +359 /2/ 563 001 **Fax:** +359 /2/ 554 158 **Email:** RIIDHE@bgcict.acad.bg
   - **Home:** Tel.: +359 /2/ 58 180 84
4. **Date and place of birth:** 13.07.1945, Lovetch, Bulgaria
5. **Education and Specialisation:**

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<tr>
<td>University education</td>
<td>University of Architecture and Civil</td>
<td>1963-1968</td>
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</table>
6. **Principal field of interest:** Irrigation and Agricultural Drainage, Ecological Problems Related to Irrigation and Drainage, Management and Conservation of Water, Resources in Agriculture, Geotextiles in Hydraulic Structures, Research and Extension Management

7. **Professional employment:**

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<tr>
<td>1968-1970</td>
<td>Lovech Irrigation Project as Irrigation and Drainage</td>
<td>Engineer</td>
</tr>
<tr>
<td>1971-1990</td>
<td>RIIDHE, Sofia</td>
<td>Research Scientist</td>
</tr>
<tr>
<td>1978-1986</td>
<td>Faculty of Hydrotechnics, University of Civil Engineering and Architecture, Sofia</td>
<td>Part-time Assistant Professor</td>
</tr>
<tr>
<td>1991-</td>
<td>RIIDHE, Sofia</td>
<td>Senior Scientist, Head of Department</td>
</tr>
<tr>
<td>1991-1992</td>
<td>RIIDHE, Sofia</td>
<td>Senior Scientist, Scientific Secretary</td>
</tr>
<tr>
<td>1993- now</td>
<td>RIIDHE, Sofia</td>
<td>Senior Scientist, Director</td>
</tr>
</tbody>
</table>

8. **Scientific research in the last 5 years (up to 15 titles in the area, concerned with global change):**


**Petkov, Pl., 1996.** Laboratory and field research on synthetic drain envelopes. Proceedings of the Workshop on the Evaluation of the Performance of Subsurface Drainage Systems - 16th ICID Congress "Sustainability of Irrigated Agriculture", Cairo, Egypt, pp. 245-265.


**Participation in councils and commissions:**

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<tr>
<td>1990-</td>
<td>Scientific Council of RlDHE</td>
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<tr>
<td>1992-</td>
<td>Executive Council of Bulgarian National Committee of ICID</td>
</tr>
<tr>
<td>1992-1997</td>
<td>Managing Board of Scientific and Technical Council of &quot;Water issues&quot;</td>
</tr>
<tr>
<td>1998-</td>
<td>National Co-ordination Center for global change to BAS</td>
</tr>
</tbody>
</table>

10. Knowledge of languages: English, Russian


**Petrov, Peter Vassilev**

1. Scientific degrees: Professor, PhD

2. Institute/enterprise/company/NGO: Sofia University “St. Kliment Ohridski”, Bulgaria, Geology and Geography Faculty

3. Address: 15, “Tzar Osoboditel” Blvd., Sofia University " St. Kliment Ohridski", Geology and Geography Faculty Sofia,1504, Bulgaria

Office Tel.: +359 /2/ 93 08 261 Fax: +359 /2/ 44 64 87 Email: tony@gea.uni-sofia.bg

Home: Tel.: +359 /2/ 524 987

4. Date and place of birth: 15.09.1933, -Sofia, Bulgaria

5. Education and specialisation: -

<table>
<thead>
<tr>
<th>Education and University, Institute</th>
<th>Year: from -</th>
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</table>
6. **Principal field of interest:** natural geography, landscape ecology, geoecology, landscape mapping

7. **Professional employment in the institute/enterprise/company/NGO** lecture in landscape ecology, geoecology, abstract geography, methods of landscape research.

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<th>Position</th>
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<td></td>
<td>Sofia University “St. Kliment Ohridski”</td>
<td>Assistant</td>
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</table>

8. **Scientific research (up to 15 titles in the area, concerned with global change)**


9. Participation in councils and commissions

10. **Knowledge of languages:** English, Russian

11. **Computer literacy:** good

---

**Petrova, Daniela**

1. **Scientific degrees:** Research Ass. PhD

2. **Institute/enterprise/company/NGO:** Institute of Fishing Resources - Varna, Bulgaria

3. **Address:** 4, “Primorski” Blvd., P.O.Box 72, Varna 9000, Bulgaria
   - **Office Tel.:** 359 /52/ 25 78 76  **Fax:** 359 /52/ 25 78 76  **E-mail:** ifr@abcis.bg, ifishres@varna.ttm.bg
   - **Home:** Tel.: 359 /52/ 74 34 36

4. **Date and place of birth:** 14.06.1961, Provadia, Bulgaria

5. **Education and Specialisation:**

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<tbody>
<tr>
<td>University education- biologist-biotechnologist</td>
<td>“Paisii Hillendarski”. Plovdiv</td>
<td></td>
</tr>
<tr>
<td>Specialisation Training Course – Foundation for European Ecological Education</td>
<td>Manchester, United Kingdom</td>
<td></td>
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6. **Principal field of interest:** zooplankton, phytoplankton, marine ecology, ecological education of children.

7. **Professional employment in the institute/enterprise/company/NGO**

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<tr>
<td></td>
<td>Institute of Fishing Resources - Varna</td>
<td>Ress. Ass. In Lab. Hydrobiology</td>
</tr>
</tbody>
</table>
8. Scientific research (up to 15 titles in the area, concerned with global change)


Georgieva,* D.P., Konsulov, P. - On the distribution of the new Ctenofoara species Mnemia mccradyi in the Black sea along the Bulgarian coastline in summer 1990 - Bulgarian Academy of Science, t. 46, N 3, 1993


* Georgieva – Bogdanova – also my names.

9. Participation in councils and commissions

Philipov, Philip Krumov

1. Scientific degrees: PhD Student
2. Institute/enterprise/company/NGO: Centre of Science Studies and History of Science
3. Address: 4, Serdica St., Sofia 1000, Bulgaria
   Office Tel.: +359 /2/ 88 38 87 Fax: +359 /2/ 980 47 57 Email: Philipovphilip@hotmail.com
   Home: Tel.: +359 /2/ 20 44 82
4. Date and place of birth: 22.06.1970, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education</td>
<td>“Kliment Ohridski” University, Sofia, Biology</td>
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6. Principal field of interest: Biology and Science Studies
7. Professional employment in the institute/enterprise/company/NGO: PhD Student
8. Scientific research (up to 15 titles in the area, concerned with global change)
9. Participation in councils and commissions
10. Knowledge of languages: English and Russian
11. Computer literacy: Microsoft Office 97

Popov, Todor Angelov

1. Scientific degrees: Prof. M.D., PhD, DSc
2. Institute/enterprise/company/NGO:
3. Address: 15, “D. Nestorov” Blrd, Sofia 1341, Bulgaria
   Office: Tel.: +359 /2/666 517, +359/2/593 045   Fax: +359 /2/ 593 045
   Email:     
   Home: Tel.:   Fax.:
4. Date and place of birth: 23.03.1937, Sofia, Bulgaria
5. Education and Specialisation:

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<tbody>
<tr>
<td>University education - Medical Doctor</td>
<td>High Medical Institute - Sofia</td>
<td>1956 - 1961</td>
</tr>
<tr>
<td>PhD</td>
<td>Medical Academy - Moscow, Russia,</td>
<td>1964 - 1966</td>
</tr>
<tr>
<td>D.Sc.</td>
<td>Union Institute of Toxicology of Pesticides - Kiev, Ukraine -</td>
<td>1973 - 1977</td>
</tr>
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6. Principal field of interest: In toxicology: pathogenesis of intoxication, biotransformation of xenobiotics, adaptation of the organism to the related action of xenobiotics, Mixed function oxidase and its role in the adaptation, biological and mathematical modelling of intoxication; In occupational and environmental epidemiology: assessing the risk incurred by subjects exposed to occupational factors and environmental hazards, biological monitoring of workers exposed to toxic agents, screening in the assessment of health risk, early detection of health impairment, changes in MFO activity as a screening test, research planning, data analysis and prediction in hygiene
7. Professional employment in the institute/enterprise/company/NGO

<table>
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<th>Position</th>
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<tbody>
<tr>
<td></td>
<td>NCHMEN - Sofia</td>
<td>Head of Department of Toxicology</td>
</tr>
<tr>
<td></td>
<td>Ministry of Health</td>
<td>National Chief Consultant and Co-ordinator in Toxicology and OH</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)
9. Participation in councils and commissions

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<tbody>
<tr>
<td></td>
<td>Board member of Medichem</td>
</tr>
<tr>
<td></td>
<td>Member of Advisory Panel in Occupational Health</td>
</tr>
<tr>
<td></td>
<td>WHO, Geneve</td>
</tr>
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</table>
Radovanova Petja Ivanova

1. Scientific degrees: PhD
2. Institute/enterprise/company/NGO: National NGO “ Union of Park & Landscape Specialists in Bulgaria ”
3. Address: 29-2, “Metlichina poljana” St., Sofia 1404, Bulgaria
   Office: Tel.: + 359 /2/ 51 8424     Fax: + 359 /2/ 951 5884     Email: parkland@sf.icn.bg
   Home: Tel.: + 359 /2/ 580 779    Fax.:+ 359 /2/ 958     Email: radovano@sf.icn.bg
4. Date and place of birth: 15.06.1960, Sofia, Bulgaria
5. Education and Specialisation:
<table>
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<th>Education and Specialisation</th>
<th>University, Institute</th>
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<tbody>
<tr>
<td>MSc Env. Sciences and Policy</td>
<td>Central European University, Budapest</td>
<td>1994-1999</td>
</tr>
<tr>
<td>M.Sc. Landscape Architecture</td>
<td>University of Forestry, Department of landscape Architecture Sofia, Bulgaria</td>
<td>1981-1986</td>
</tr>
<tr>
<td>Photographer</td>
<td>School of Photography “Julius Fucik”, Sofia, Bulgaria</td>
<td>1978-1980</td>
</tr>
</tbody>
</table>
6. Principal field of interest: globalisation, Urban ecology, Urban and community forest, Urban regeneration, Social and cultural approval of landscape, Public perceptions, preferences and awareness.
7. Professional employment in the institute/enterprise/company/NGO
<table>
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<th>Period from - to</th>
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<th>Position</th>
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<tbody>
<tr>
<td>1987</td>
<td>National Botanical Garden, Sofia</td>
<td>Expert landscape and Ecology</td>
</tr>
<tr>
<td>1995</td>
<td>Forest Technical University, Educational Office</td>
<td>Inspector</td>
</tr>
<tr>
<td>1996-1996</td>
<td>Central European University, Budapest, Hungary, Dept. of Environmental Sciences and Policy</td>
<td>Teaching Assistant</td>
</tr>
<tr>
<td>1996-1997</td>
<td>University of Central England, Birmingham Faculty of the Built Environment</td>
<td>Research Assistant</td>
</tr>
<tr>
<td>1997-now</td>
<td>Union of Bulgarian Park &amp; Landscape Experts</td>
<td>Project leader</td>
</tr>
<tr>
<td>1999-now</td>
<td>Dept. Env. &amp; Earth Sciences, New Bulgarian University</td>
<td>Research Co-ordinator</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)
9. Participation in councils and commissions
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<tr>
<td>1992- now</td>
<td>National Committee Against Noise</td>
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<td>1997-1998</td>
<td>Civil Society Development Foundation</td>
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</table>
Ratchev, Georgi Dontchev

1. **Scientific degrees:** Assoc. Prof., Ph. Doctor
2. **Institute/enterprise/company/NGO:** Sofia University “St. Kliment Ohridski”
3. **Address:** 15, “Tzar Osvoboditel” Blvd., Sofia 1504, Bulgaria
   - **Office Tel.:** /359 2/ 9308 362
   - **Fax:** /359 2/ 446 487
   - **Email:** ratchevg@ns.uni-sofia.bg
   - **Home Tel.:** /359 2/ 730 473
   - **Fax.:** /359 2/ 981 5471
   - **Email:** compass@bitex.com
4. **Date and place of birth:** 11.10.1955, Sofia, Bulgaria
5. **Education and Specialisation:**

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<tr>
<td><strong>University education</strong></td>
<td>Sofia University “St. Kliment Ohridski”, Faculty of Geology and Geography, Department Climatology and Hydrology</td>
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</tr>
<tr>
<td><strong>Specialisation</strong></td>
<td>Scopie University</td>
<td>1989</td>
</tr>
<tr>
<td><strong>Specialisation</strong></td>
<td>Moscow University</td>
<td>1989</td>
</tr>
<tr>
<td><strong>Specialisation</strong></td>
<td>University of Thessaloniki</td>
<td>1991</td>
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</tbody>
</table>
6. **Principal field of interest:** Applied Climatology; External exhibits of the environment; Restoring power resources; Economical and legal assesses of premeditated and unpremeditated influences upon environment.
7. **Professional employment in the institute/enterprise/company/NGO**

<table>
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<tr>
<td></td>
<td>University “St. Kliment Ohridski”</td>
<td>Assoc. Prof</td>
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</table>
8. **Scientific research (up to 15 titles in the area, concerned with global change)**
   - **Ratchev, G. 1992** Heavy snowfall over the territory of the town of Sofia – Ann. SU, t.83, FGG, b.2 – Geography, 49-54.
   - **Ratchev, G. et G. Gaidarova. 1993.** Des chutes de neige abondantes dans la plaine Petrich- Sandanski Association Internationale de Climatologie. 6-e Colloque International de Climatologie, Thessaloniki, Grece,
   - **Ratchev, G. 1995,** Distribution of the cases and typification of the synoptical conditions, causing the heavy snowfall over Southwest Bulgaria – Ann. SU, t.86, FGG, b.2- Geography, 33-54.
   - **Penkov. Iv., G. Ratchev. 1983,** Synoptical conditions and their influence upon the creation of high waves along the riverbeds of Jantra and Varbitsa.– Ann. SU, t.77, FGG, b.2 – Geography, 62-83.
   - **Ratchev, G., Dr. Jetchev. 1992,** Peculiarities of the regime of atmospheric pressure in Bulgaria, with the exception of mountainous regions. – Ann. of SU, t. 84, FGG, b.2 – Geography, 37 – 48.
Ratchev, G. 1995. global problems of the meteorological network and the collecting of meteorological information in Bulgaria. Problems of the regional development in Bulgaria.– Nessebar

9. Participation in councils and commissions

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<td>1995-1996</td>
<td>Council of the Faculty of Geology and Geography</td>
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10. Knowledge of languages: Russian, French, English

11. Computer literacy: good skills

Rousev, Marin Rahnev

1. Scientific degrees: Assistant Professor, PhD
2. Institute/enterprise/company/NGO: Sofia University St. Kliment Ohridski Faculty of Geology and Geography
3. Address: 15, “Tzar Ossovoboditel” Blvd., Sofia 1504, Bulgaria
   Office Tel.: +359 /2/ 9308-419   Fax: (359 2) 446-487 Email: rusevm@gea.unisofia.bg
   Home: Tel.: +359 /2/ 9789-762; +359 /2/ 9789-347 Email: rusevm@gea.unisofia.bg
4. Date and place of birth: 18.05.1961, Sliven, Bulgaria
5. Education and Specialisation:

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<tbody>
<tr>
<td>University education</td>
<td>Geography (Sofia University)</td>
<td>1986</td>
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<tr>
<td>PhD in Geography</td>
<td>(Sankt Petersburg St. University)</td>
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6. Principal field of interest: Regional and Political Geography, Sustainable Development

7. Professional employment in the institute/enterprise/company/NGO

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<tr>
<td>Sofia University St. Kliment Ohridski, Faculty of Geology and Geography</td>
<td>Assistant Professor</td>
<td></td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)

9. Participation in councils and commissions
10. Knowledge of languages: Russian, English

Rousseva, Svetla Simeonova

1. Scientific degrees: Senior Research Associate, PhD
2. Institute/enterprise/company/NGO: “N. Poushkarov Research Institute for Soil Science and Agroecology
3. Address: 7 Shosse Bankya, Sofia 1080, Bulgaria

Office Tel.: +359 /2/ 240 345. Fax: ++359 /2/ 248937 Email: svtroud@yahoo.com
Home: Tel.: +359 /2/ 667 930 Email: svtroud@yahoo.com

4. Date and place of birth: 07.12.1951, Sofia, Bulgaria
5. Education and Specialisation:

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</thead>
<tbody>
<tr>
<td>University education - Radio-physics and Physical Electronics</td>
<td>Sofia University“St. Kliment Ohridski”, Faculty of Physics</td>
<td>1969-1974</td>
</tr>
<tr>
<td>University education - Biophysics</td>
<td>Sofia University“St. Kliment Ohridski”, Faculty of Physics</td>
<td>1974-1976</td>
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6. Principal field of interest: Soil Erosion (soil erodibility, rainfall erosivity, soil erosion prediction models, relationships between the soil physical properties and the soil erosion processes), Soil Physics (harmonisation of methods for determination of the soil physical properties, anthropogenic affects on the soil physical properties, Physical characteristics for soil diagnostics and classification).

7. Professional employment in the institute/enterprise/company/NGO:

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<th>Position</th>
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<tr>
<td>Sofia University St. Kliment Ohridski, Faculty of Geology and Geography,</td>
<td>Deputy Head of Soil Erosion Department</td>
<td></td>
</tr>
<tr>
<td>Sofia University St. Kliment Ohridski, Faculty of Geology and Geography</td>
<td>Project Manager of research project No 3/1999, funded by the Agricultural Academy</td>
<td></td>
</tr>
<tr>
<td>Sofia University St. Kliment Ohridski, Faculty of Geology and Geography</td>
<td>Project Manager of concerted action project No ERB IC15-CC98-0125 (DG12-CDPE), funded by EuropeanCommission</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change):


9. Participation in councils and commissions

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<tbody>
<tr>
<td>1997</td>
<td>Specialised Scientific Council for Soil Science, Agro-chemistry and General Agronomy at the Higher Testimonial Board</td>
</tr>
</tbody>
</table>

10. Knowledge of languages: English, Russian, Italian, German
11. **Computer literacy**: MS Word, MS Excel, Statistica, Origin, Image Analysis, Photoshop.

**Sarafksa, Nely Stefanova**

1. **Scientific degrees**: assistant professor, PhD
2. **Institute/enterprise/company/NGO**: Sofia University St. Kliment Ohridski, Faculty of Geology and Geography, Department Klimotology and Hydrology
3. **Address**: 15, " Tsar Osvoboditel" Blvd., Sofia 1504, Bulgaria
   - Office Tel.: +359/2/44-64-87, +359/2/93-08(217)  **Fax:** +359/2/44-64-87  **Email:** nelys@gea.uni-sofia.bg
   - **Home**: Tel.: +359 /2/ 73-75-04
4. **Date and place of birth**: 12.08.1958, Shoumen, Bulgaria
5. **Education and specialisation**:

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<tr>
<td>University education</td>
<td>Sofia University “St. Kliment Ohridski”, Faculty of Geology and Geography, Department Klimotology and Hydrology</td>
<td></td>
</tr>
</tbody>
</table>

6. **Principal field of interest**: regime of runoff, the flow variation under the anthropogenic activities, self-organisation in river system, fractal in basin drainage, chaos in river system.

7. **Professional employment in the institute/enterprise/company/NGO**: lecture, seminars and exercise by hydrology

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<tbody>
<tr>
<td>Sofia University St. Kliment Ohridski, Faculty of Geology and Geography</td>
<td>assistant professor</td>
<td></td>
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</table>

8. **Scientific research (up to 15 titles in the area, concerned with global change)**: Variation in the annual and monthly runoff of the river Voucha under the influence of the anthropogenic activities. Organisation of river system under anthropogenic activities. Monthly and seasonal runoff distribution in the basin of the Iskar river under anthropogenic activities.

9. **Participation in councils and commissions**

<table>
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<tr>
<td>1997</td>
<td>National committee by water</td>
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</table>

10. **Knowledge of languages**: English, Russian
11. **Computer literacy**: very well

**Simeonov, Ivan**

1. **Scientific degrees**: 
2. **Institute/enterprise/company/NGO**: Institute of Microbiology, Bulgarian Academy of Sciences
3. **Address**: “Acad. G. Bonchev” St., Bl. 26, Sofia 1113, Bulgaria
   - Office: Tel.: +359/2/979 36 14  **Fax:** +359/2/70 01 09  **Email:** ISSIM@bgcict.acad.bg, ISSIM@microbio.bas.bg, ISSIM@bas.bg
   - **Home**: Tel.: +359 /2/ 54 15 50  **Fax:** Email: ISSIM1@usa.net
4. **Date and place of birth**: 28.01.1948, Bulgaria
5. Education and Specialisation:

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<tbody>
<tr>
<td>PhD on engineering</td>
<td>Technical University of Sofia</td>
<td>1977-1981</td>
</tr>
<tr>
<td>Certificates for stages on Automatic Control</td>
<td>University of Paris VI and Ecole Superieur d’Electricite (France)</td>
<td>1971-1973</td>
</tr>
<tr>
<td>Diploma in Automatics</td>
<td>Technical University of Sofia</td>
<td>1966-1971</td>
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6. Principal field of interest: Biotechnological and environmental processes; Technology and instrumentation evaluation in the field of environment protection, Bioprocess engineering; Environmental engineering

7. Professional employment in the institute/enterprise/company/NGO

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<th>Position</th>
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<tbody>
<tr>
<td>1974-1978</td>
<td>Central Institute for Automation, Sofia</td>
<td>Research and development engineer</td>
</tr>
<tr>
<td>1981-1994</td>
<td>Central Laboratory of Scientific Instrumentation and Bioautomation-BAS</td>
<td>Head of Department “Environmental Engineering”</td>
</tr>
<tr>
<td>1986-1988</td>
<td>Faculty of biology, State University of Sofia</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>1986-1988</td>
<td>Faculty of biology, State University of Sofia</td>
<td>Associate Professor</td>
</tr>
<tr>
<td>1986-</td>
<td>Institute of Microbiology, Bulgarian Academy of Sciences</td>
<td>Senior Research Associate</td>
</tr>
<tr>
<td>1988-1999</td>
<td>Faculty of Automatics, French Faculty, Free Faculty, Technical University of Sofia</td>
<td>Associate Professor</td>
</tr>
<tr>
<td></td>
<td>Institute of Microbiology, Bulgarian Academy of Sciences</td>
<td>Head of scientific group</td>
</tr>
<tr>
<td>1988-</td>
<td>Technical University of Sofia</td>
<td>Associate Professor</td>
</tr>
</tbody>
</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)

9. Participation in councils and commissions

<table>
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<tbody>
<tr>
<td>1998-</td>
<td>President of the Bulgarian National Society on Ecological Engineering and Environment Protection since</td>
</tr>
</tbody>
</table>

10. Knowledge of languages: French, English, Russian

11. Computer literacy:

Slaveikov, Peter Lozanov

1. Scientific degrees: Assoc. Professor, PhD
2. Institute/enterprise/company/NGO: Sofia University “Sf Kl.Ohridsky”, Faculty of Geology and Geography.
3. Address: 15, "Tzar Osvoboditel" Blvd, Sofia 1000, Bulgaria
   Office: Tel.: +359 /2/ 9308 360       Fax: +359 /2/ 446-487       Email: Slav@gea.uni-sofia.bg
   Home: Tel.: +359 /2/ 762-132         Fax:             Email: Slav@gea.uni-sofia.bg
4. Date and place of birth: 05.06.1956, Shumen, Bulgaria
5. Education and Specialisation:

<table>
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<tr>
<td>University education</td>
<td>Sofia University, GGF, Geography and Geodemography</td>
<td></td>
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**6. Principal field of interest:** Demography, Ethno-konfesional geography, Urbanistic.

**7. Professional employment in the institute/enterprise/company/NGO:**

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<tr>
<td></td>
<td>Sofia University &quot;St Kl.Ohridsky&quot;, Faculty of Geology and Geography</td>
<td>Lecturer</td>
</tr>
<tr>
<td></td>
<td>Plovdiv University</td>
<td>Lecturer</td>
</tr>
<tr>
<td></td>
<td>New Bulgarian University</td>
<td>Lecturer</td>
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**8. Scientific research (up to 15 titles in the area, concerned with global change)**

- **Slaveikov, P., 1992.** Some tendencies in the changes of the population from Antiquity up to now."The teaching on Geography", ’3,p.2-10.
- **Slaveikov, P., I. Balev, 1996.** Housing found and housing conditions in Bulgarian village. “The Potential of the village for global tomorrow.”,p.110-120.

**9. Participation in councils and commissions**

<table>
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<th>Name of the council or the commission</th>
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**10. Knowledge of languages:** English, Russian, Serbo-Croatian, Polish.

**11. Computer literacy:** Word DOS / Windows, Excel.

---

**Stanev, Tzvetan Todorov**

**1. Scientific degrees:** Research Ass.

**2. Institute/enterprise/company/NGO:** Institute of Fishing Resources - Varna

**3. Address:** P.O. Box 72, 4, “Primorski” Blvd., Varna 9000, Bulgaria,

**Office Tel.: +359 /52/ 25 78 76**

**Fax: +359 /52/ 25 78 76**

**Email:** ifishres@varna.ttm.bg

**Home: Tel.: +359 /52/ 25 09 95**

**Email:** dessi@techno-link.com

**4. Date and place of birth:** 20.10.1941, Bulg. Slivovo, Bulgaria.

**5. Education and Specialisation:**

<table>
<thead>
<tr>
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<tr>
<td>University education</td>
<td>Sofia University “St. Kliment Ohridski”, Biology Fac, Biochemistry and Physiology of animal and man.</td>
<td></td>
</tr>
<tr>
<td>Specialisation</td>
<td>Holand, National Institute for Marine Research</td>
<td>1974-1975</td>
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**6. Principal field of interest:** Marine mammals, microbiology, ecology.

**7. Professional employment in the institute/enterprise/company/NGO:**
IHDP Seed Grant Initiative Final Reports 1999-2000

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<tbody>
<tr>
<td></td>
<td>Institute of Fishing Resources - Varna</td>
<td>Ress. Ass. in Lab. Hydrobiology</td>
</tr>
<tr>
<td></td>
<td>Delphinarium&quot;- Varna</td>
<td>Scientific Consultant</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change)
Distribution and number of dolphins in the Black Sea – species T.truncatus, D.delphis, P.phocaena in the period 1992-95. (in print)
9 Participation in councils and commissions

Staneva, Marieta Panaiotova

1. Scientific degrees: Prof. Dr.
2. Institute/enterprise/company/NGO: The Pennsylvania State University
3. Address: Department of Geography, St 302 Walker Building, University Park, PA 16802
   Tel.: 814/863 8571       Fax: 814/863 7943       Email: mps5@psu.edu
4. Date and place of birth: 
5. Education and Specialisation: 
6. Principal field of interest: Human Dimensions of global Change
7. Professional employment in the institute/enterprise/company/NGO:
8. Scientific research (up to 15 titles in the area, concerned with global change)

101


9 Participation in councils and commissions
10.Knowledge of languages:
11.Computer literacy:

Stoikov, Stoiko Mitev

1. Scientific degrees: PhD, Ass. Prof.
2. Institute/enterprise/company/NGO: Institute of Fishing Resources-Varna.
3. Address: 4, “Primorski” Blvd., P.O.Box 72, Varna 9000, Bulgaria
   Office    Tel.: +359 /52/ 25 78 76   Fax: +359 /52/ 25 78 76      Email: ifr@abcis.bg
   Home:    Tel.: +359/52/ 25 89 93
4. Date and place of birth: 12.02.1940, Kazashka reka, Bulgaria
5. Education and Specialisation

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<th>Education and Specialisation</th>
<th>University, Institute</th>
<th>Year: from - to</th>
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<tbody>
<tr>
<td>University education</td>
<td>Plovdiv University, Dept.of Biology</td>
<td></td>
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<tr>
<td>Ph.D</td>
<td>Sofia</td>
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6. Principal field of interest: benthos, ecology.
7. Professional employment in the institute/enterprise/company/NGO:

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<tbody>
<tr>
<td>IFR-Varna</td>
<td>Vice-Director</td>
</tr>
<tr>
<td>Varna Technical University</td>
<td>Ass.Prof.</td>
</tr>
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</table>
8. Scientific research (up to 15 titles in the area, concerned with global change)


Stoykov St., Ouzounova, S. 1999. Dynamics of macrozoobenthos in the southern Bulgarian Black Sea coastal and open-sea areas: Journal "MEDITERRANEAN MARINE SCIENCE" (in press).


9. Participation in councils and commissions


---

Tenev, Boytcho Tenev

1. Scientific degrees: Scientist Researcher
2. Institute: Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia
3. Address: 136, “Tzar Boris III” Blvd., Sofia 1618, Bulgaria
   Office Tel.: +359 /2/ 551 131 Fax: +359 /2/ 554 158 Email: water@mail.techno-link.com
   Home: Tel.: +359 /2/ 978 68 18
4. Date and place of birth: 16.08.1955, Stara Zagora, Bulgaria
5. Education and Specialisation:

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<tbody>
<tr>
<td>University education-Hydroengineering</td>
<td>University of Economics -Varna</td>
<td>1975-1980</td>
</tr>
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</table>

6. Principal field of interest: management, co-ordination formulation, execution, monitoring, evaluation and implementation of different projects connected with irrigation and drainage, water resources management, water quality projects evaluation, economic & financial feasibility.

7. Professional employment:

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<tbody>
<tr>
<td>1980-1982</td>
<td>Irrigation Systems Company, Branch Stara Zagora town</td>
<td>Engeneer and Head of Regional department</td>
</tr>
<tr>
<td>1982-1988</td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering. Experimental Stantion of Irrigated Agriculture, Stara Zagora, Bulgaria</td>
<td>Scientist Researcher</td>
</tr>
<tr>
<td>1988- up to now</td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering</td>
<td>Scientist Researcher</td>
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9. Scientific research (up to 15 titles in the area, concerned with global change)

10. Knowledge of languages: English, German, Russian

11. Computer literacy: Wordprocessors, Spreadsheets, Access, Internet and e-mail user, home pages
Todorova, Sevdalina Neytcheva

1. Scientific degrees: M.Sc.
2. Institute/enterprise/company: Energoproekt
3. Address: 51, “James Boucher” Blvd., Sofia 1407, Bulgaria
   Office Tel.: +359 /2/ 62 40 58
   Home: Tel.: +359 /2/ 292 36 73
4. Date and place of birth: 13.05. 1969, Varna, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education</td>
<td>Institute of Chemical Technologies and Metallurgy</td>
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<tr>
<td>Specialisation - Environmental Protection and Sustainable Development -- Environmental issue</td>
<td>Brussels</td>
<td>1997</td>
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6. Principal field of interest: Bulgarian country study to address climate changes, Inventory of Greenhouse Gases emission Sources and Sinks, Climate change action plan, Reduction of Sulphur Dioxide and Particulate emissions, Kyoto mechanisms

7. Professional employment in the institute/enterprise/company/NGO:

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<tr>
<td></td>
<td>NGO: Energoproekt - System analysis Department</td>
<td>specialist</td>
</tr>
</tbody>
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8. Scientific research (up to 15 titles in the area, concerned with global change)
   Todorova S., Chr. Christov, Chr. Vassilev. 1998. global Aspects of Climate Change, Workshop “Reduction of GHG Emissions in Bulgarian Energy Sector”, 6-7 October Dupnitsa
   Vassilev Chr., Chr. Christov, S. Todorova 1998, GHG Emissions Sources, Workshop “Reduction of GHG Emissions in Bulgarian Energy Sector”, 6-7 October Dupnitsa

9. Participation in councils and commissions
10. Knowledge of languages: English, French, Russian
11. Computer literacy: MS Office (Word, Excel, Power Point, etc.)

Toncheva, Draga Ivanova

1. Scientific degrees: PhD
2. Institute/enterprise/company/NGO: Medical University Sofia
3. Address: Medical University Sofia, Department of Medical Genetics, University Hospital of Obstetrics and Gynecology, Zdrave 2 str., 1341 Sofia, Bulgaria
Office: Tel.: +359 /2/ 517 202 Fax: +359 /2/ 517 202 Email: draga@sofiaonline.com
Home: Tel.: +359 /2/ 366 347 Fax: draga@sofiaonline.com
4. Date and place of birth: 23.07.1950, Sofia, Bulgaria
5. Education and Specialisation:

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<th>Education and Specialisation</th>
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<tr>
<td>University education M.D.</td>
<td>Medical Institute, Medical Faculty-Sofia, Bulgaria</td>
<td>1968-1974</td>
</tr>
<tr>
<td>PhD</td>
<td>Department of Medical Genetics, Medical Institute, Medical Faculty-Sofia, Bulgaria</td>
<td>1974-1978</td>
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</table>


7. Professional employment in the institute/enterprise/company/NGO
8. Scientific research (up to 15 titles in the area, concerned with global change)


Toncheva D. Variants of glucose-6-phosphate dehydrogenase in a vietnamese population. Hum Hered, 1986, 36(6), 348-351.


9. Participation in councils and commissions

<table>
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<th>Year: from - to</th>
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<tr>
<td>1999</td>
<td>Member of European Advisory Council</td>
</tr>
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10. Knowledge of languages: English

11. Computer literacy: yes

Topalova, Jana Ilieva

1. Scientific degrees:
2. Institute: Sofia University, Faculty of Biology
3. Address: 9, “Dragan Tzankov” St. Sofia 1421, Bulgaria
Office Tel.: +359 /2/ 668619 Fax: Email: topalova@biofac.uni-sofia.bg
4. Date and place of birth: 08.08.1956, Bulgaria

5. Education and specialisation:

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<th>Education, Specialisation</th>
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<tbody>
<tr>
<td>University education - Molecular and Functional Biology and Microbiology</td>
<td>Sofia University, Faculty of Biology</td>
<td>1979-1981</td>
</tr>
<tr>
<td>Postgraduate Specialisation on Mechanisms of Action of the Antibiotics in Department of Microbiology</td>
<td></td>
<td>1981-1983</td>
</tr>
<tr>
<td>PhD on Microbiological and Enzymological Aspects of Phenol Biodegradation</td>
<td>Department of Microbiology, Sofia University;</td>
<td>1983-1986</td>
</tr>
<tr>
<td>Specialisation on taxonomical identification of the microorganisms</td>
<td>University of Malta, La Valletta</td>
<td>1990</td>
</tr>
<tr>
<td>Specialisation on Total Quality Management and Risk Assessment</td>
<td>Technological Institute (KIHO), Gent, Belgium,</td>
<td>1995</td>
</tr>
<tr>
<td>specialisation on Environmental Management.</td>
<td>Technological Institute (KIHO), Gent, Belgium,</td>
<td>1996</td>
</tr>
<tr>
<td>specialisation on Advanced Methods for Laboratory Construction of Microbial Communities with High Biodegradation Activities</td>
<td>Institute of Microbiology and Genetics, Gotingen, Belgium,</td>
<td>1997</td>
</tr>
<tr>
<td>specialisation on mechanisms of Biodegradation of Hazardous Pollutants</td>
<td>Stuttgart University, Institute for Water Research</td>
<td>1999</td>
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6. Principal field of interests:
7. Professional employment:

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<tbody>
<tr>
<td>1984-1990</td>
<td>Department of Environmental Biotechnology, Faculty of Biology, Sofia University</td>
<td>Assistant Professor</td>
</tr>
<tr>
<td>1990-1997</td>
<td>Department of Environmental Biotechnology, Faculty of Biology, Sofia University</td>
<td>Chief Assistant Professor</td>
</tr>
<tr>
<td>1998-</td>
<td>Lab. Environmental Biotechnology in Department of Hydrobiology, Faculty of Biology, Sofia University. Habilitation on Biological Control and Water Treatment Management</td>
<td>Associate Prof.</td>
</tr>
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</table>

8. Scientific research (up to 15 titles in area, concerned with global change):


Topalova Y., (1986. Microbiological and Enzymological aspects of Phenol Biodegradation PhDReferat, Sofia University, p.27 (bulg.).


9. Participation in councils and commissions

<table>
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<th>Year: from – to:</th>
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<tbody>
<tr>
<td></td>
<td>Academical Council of Sofia University “St. Kliment Ochridski”</td>
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</table>
Tzankov, Nikolay Stantchev

1. **Scientific degrees:** Scientific Researcher
2. **Institute:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE)
3. **Address:** 136, “Tzar Boris” blvd, Sofia 1618, Bulgaria
   - **Office Tel.:** + 359 /2/ 55 11 31 or 55 11 45
   - **Fax:** +359 /2/ 55 41 58
   - **Email:** Tzankov@usa.net
4. **Date and place of birth:** 08.03.1954, Sofia, Bulgaria
5. **Education and specialisation:**
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<tbody>
<tr>
<td>University on Architecture, Civil Engineering and Architecture and Geodesy</td>
<td>1975 - 1980</td>
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<tr>
<td>Food and Agriculture Organisation HQ-Rome, Italy</td>
<td>1993-</td>
</tr>
<tr>
<td>Colorado State University International Centre of Agricultural and Resource Development, Fort Collins, Colorado, USA.</td>
<td>1994-</td>
</tr>
<tr>
<td>International Hydrological Training Centre, Menemen, Turkey</td>
<td>1997-</td>
</tr>
<tr>
<td>University education</td>
<td>M. Sc. in Civil Engineer Irrigation and Drainage</td>
</tr>
<tr>
<td>Formulation Implementation, Monitoring and Evaluation of Investment and Technical co-operation Projects - Lecturer.</td>
<td></td>
</tr>
<tr>
<td>Irrigation Extension for Private Farmers</td>
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<tr>
<td>Agrometeorological Effects on Sustainable Agriculture and Water Resources</td>
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</table>
6. **Principal field of interest:** global Change, Environment Protection, Water Ecology., Drainage, Salinisation
7. **Professional employment:**
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<th>Position</th>
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<tbody>
<tr>
<td>1980-1982</td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering</td>
<td>Engineer</td>
</tr>
<tr>
<td>1982-1993</td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering</td>
<td>Researcher</td>
</tr>
<tr>
<td>1993-</td>
<td>Research Institute for Irrigation, Drainage and Hydraulic Engineering</td>
<td>Head of Department</td>
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</table>
8. **Scientific research (up to 15 titles in the area, concerned with global change)**
9. **Participation in council and commissions**
<table>
<thead>
<tr>
<th>Year: from - to</th>
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</tr>
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<tbody>
<tr>
<td>Bulgarian National Water Association, Executive Director</td>
<td></td>
</tr>
<tr>
<td>FAO IPTRID co-ordinator for Bulgaria</td>
<td></td>
</tr>
</tbody>
</table>
10. **Knowledge of languages:** English, Russian
11. **Computer literacy:** excellent capabilities, MS Office, GC programmes, Internet and e-mail user, home pages.
Tzonev, Stefan Venetz

1. Scientific degrees:
2. Institute/enterprise/company/NGO: National Statistical Institute of Bulgaria
3. Address: 2, "P. Volov" St. Sofia 1504, Bulgaria
   Office Tel.: +359 /2/ 985 72 637  Fax: Email: Stzonev@nsi.bg

Home: Tel.: +359 /2/ 986 4103
4. Date and place of birth: 02.07.1953, Sofia, Bulgaria
5. Education and Specialisation:

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<th>Education and Specialisation</th>
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<tbody>
<tr>
<td>Statistics</td>
<td>Higher Institute of Economics &quot; Karl Marx&quot;</td>
<td>1973-1978</td>
</tr>
<tr>
<td>Economics and Management of Regional Systems</td>
<td>Higher Institute of Economics &quot; Karl Marx&quot;</td>
<td>1982</td>
</tr>
</tbody>
</table>

6. Principal field of interest: Environmental Statistics
7. Professional employment in the institute/enterprise/company/NGO

<table>
<thead>
<tr>
<th>period from – to</th>
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<th>Position</th>
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<tbody>
<tr>
<td>1982 - 1992</td>
<td>National Statistical Institute</td>
<td>Researcher</td>
</tr>
<tr>
<td>1992</td>
<td>National Statistical Institute</td>
<td>Head of Environmental Statistical Unit</td>
</tr>
</tbody>
</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)
   - Energy balance of the country and air pollution - 1980;
   - Complex estimation of quality of air, water and soil, air basins etc.- 1982;
   - Statistical survey of the air emissions from point sources - 1984;
   - Statistical survey of the air emissions from the transport - 1985;
   - Methodological problems of the link between environmental statistical data and data of economical activity of industrial enterprises - 1991;

9. Participation in councils and commissions
10. Knowledge of languages: English, Russian
11. Computer literacy: Word, Excel

Tzvetkova, Elka Varbanova

1. Scientific degrees: Senior Research Associate, PhD
2. Institute/enterprise/company/NGO: "N. Poushkarov Research Institute for Soil Science and Agroecology
3. Address: 7, "Shosse Bankya" St., Sofia 1080, Bulgaria
   Office Tel.: ++359 /2/ 240 345  Fax: ++359 /2/ 248 937
   Home Tel.: ++359 /2/ 667 930
4. Date and place of birth: 10.05.1948, Lehchevo, Montana destr., Bulgaria
5. Education and Specialisation:

<table>
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<tr>
<td>University education - Agronomist</td>
<td>Higher Agricultural Institute</td>
<td></td>
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<tr>
<td>PhD</td>
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</table>
6. **Principal field of interest:** Soil Erosion, Erosion leaching of the basic soil nutrients, Agro-techical measures for erosion control and increasing the fertility of eroded lands.

7. **Professional employment in the institute/enterprise/company/NGO:**

<table>
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<th>Position</th>
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</thead>
<tbody>
<tr>
<td>&quot;N. Poushkarov Research Institute for Soil Science and Agroecology</td>
<td>Deputy Head of Soil Erosion Department</td>
<td></td>
</tr>
</tbody>
</table>

8. **Scientific research (up to 15 titles in the area, concerned with global change):**


   - **Tzvetkova, Å., A. Momchev, Y. Momcheva, 1994.** Antierosion and agrotechnical efficiency of some basic tillages and crop rotations on calcareous Chernozem, Soil Science, Agrochemistry and Ecology, 29 (4-6), 158-159.


   - **Tzvetkova, E., S. Rousseva, L. Lozanova, E. Markov, 1999.** Soil erosion and nutrient losses from crops grown on Chromic Luvisols 5-th International Meeting on Soils with Mediterranean Type of Climate, July 4-9 1999, Barcelona, Spain, 1058-1061.

9. **Participation in councils and commissions**

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<thead>
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<tr>
<td>1992-1993</td>
<td>Scientific Council of RISSA &quot;N.Poushkarov&quot;</td>
</tr>
</tbody>
</table>

10. **Knowledge of languages:** English, Russian

11. **Computer literacy:** MS Word, MS Excel.

---

**Vassilev, Hristo**

1. **Scientific degrees:** Ph. D., Senior Research Associate

2. **Institute/enterprise/company/NGO:** Energoproekt PLC

3. **Address:** 51, J. Boucher Blvd, Sofia1407, Bulgaria
   - Office: Tel.: +359 /2/ 68 80 34  Fax: +359 /2/ 66 89 51
   - Email: nhv@enpro.bg
   - Home: Tel.: +35 /2/ 44 46 44  Email: hrvv@netbg.com

4. **Date and place of birth:** 11.05.1947, Sofia, Bulgaria

5. **Education and Specialisation:**

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<tbody>
<tr>
<td>M.Sc.; Speciality: Power Plants, Networks and Systems</td>
<td>Sofia Technical University</td>
<td>1965-1970</td>
</tr>
<tr>
<td>Postdiploma Specialisation in Applied Mathematics for Engineers</td>
<td>Sofia Technical University</td>
<td>1978-1980</td>
</tr>
<tr>
<td>Ph. D.; Electric Power Systems and Control</td>
<td>Sofia Technical University</td>
<td>1982-1984</td>
</tr>
</tbody>
</table>
6. Principal field of interest: Electric power system transients and steady-state stability, Design and investigations of 750 kV tie-line, Nuclear Power plants and HV-transmission network, Development of fuel and energy balances, Energy system expansion planning, Electric networks expansion planning, Study on high voltage transmission network, Bulgarian country study to address climate changes, Inventory of Greenhouse Gases emission Sources and Sinks, Projection of the development of the energy sector

7. Professional employment in the institute/enterprise/company/NGO

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<tr>
<td>1970-1973</td>
<td>Energoproekt, Sofia, Bulgaria</td>
<td>Engineer</td>
</tr>
<tr>
<td>1973-1985</td>
<td>Energoproekt, Sofia, Bulgaria</td>
<td>Research associate</td>
</tr>
<tr>
<td>1988-1991</td>
<td>Elprom, Sofia, Bulgaria</td>
<td>Head of Laboratory for examination of electric equipment</td>
</tr>
<tr>
<td>1991- up to now</td>
<td>Energoproekt</td>
<td>Senior Research Associate at System analyses Department</td>
</tr>
</tbody>
</table>

8. Scientific research (up to 15 titles in the area, concerned with global change).


K. Simeonova, Christov Chr., Vassilev Chr. and others.- Mitigation Analysis for Bulgaria, global Climate Change Mitigation Assessment: Results for 14 Transitioning and Developing Countries, August,1997


Vassilev Hr.- Comparative Assessment of IPCC and CORINAIR Methodologies for GHG Inventory - Energy Forum’98, Varna, 10-12 June, 1998( on Bulgarian)


Vassilev H.- Methodological Problems in the Comparative Estimation on Greenhouse Gas Emission According to the IPCC Methodology, The 10-th global Warming International Conference, 5-8 May, 1999, Tsukuba, Japan


9. Participation in councils and commissions

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<tr>
<td>1997 -</td>
<td>National Co-ordination Center for global Change</td>
</tr>
</tbody>
</table>

10. Knowledge of languages: English, Russian, German


Velev, Stefan Borisov

1. Scientific degrees: Associate Professor, PhD
2. Institute/enterprise/company/NGO: Institute of Geography
3. Address: “Acad. G. Bonchev” St. block 3, Sofia 1113, Bulgaria

Office Tel.: +359 /2/ 979 33 70    Email: Stefan.Velev@mbox.bol.bg
Home: Tel.: +359 /2/ 89 71 73

4. Date and place of birth: 21.12.1939, Sofia, Bulgaria

5. Education and Specialisation:

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<tbody>
<tr>
<td>University education</td>
<td>Sofia University &quot;St. Kliment Ohridski&quot;, Department of Geology and Geography.</td>
<td></td>
</tr>
<tr>
<td>Specialisation - physical geography</td>
<td>Russia</td>
<td>1972</td>
</tr>
<tr>
<td>Specialisation - physical geography</td>
<td>Czech Republic</td>
<td>1974</td>
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</tbody>
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6. Principal field of interest: physical geography, climatology and environmental protection

7. Professional employment in the institute/enterprise/company/NGO:

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<th>Position</th>
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<tbody>
<tr>
<td></td>
<td>Institute of Geography</td>
<td>Associate Professor in the Section &quot;Physical Geography&quot;</td>
</tr>
<tr>
<td></td>
<td>Veliko Tarnovo University &quot;St. St. Cyril and Methodius&quot;</td>
<td>Lecturer in the on &quot;physical geography of Bulgaria&quot;</td>
</tr>
</tbody>
</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)
Velev, S., et al., 1995, The Emerging Water Crisis in Bulgaria, GeoJournal #4
Velev, S., 1996, Is Bulgaria Becoming Warmer and Drier?, GeoJournal #4
Velev, S., 1998, Tendencies in the Changes of Air Temperatures and Precipitation in Bulgaria, Papers from the International Scientific Conference "100 Anniversary of Geography at Sofia University" (14-16 May, 1998)

9. Participation in councils and commissions

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<th>Year: from - to</th>
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<tbody>
<tr>
<td>1992 - 1997</td>
<td>member of the Specialised Council in Geographical Sciences at the Supreme Certifying Commission</td>
</tr>
<tr>
<td>1998 until now</td>
<td>member of the Sub-Commission in Geology and Geography at the Supreme Certifying Commission</td>
</tr>
</tbody>
</table>

10. Knowledge of languages: French, Russian, English
11. Computer literacy: none

Velikova, Violeta Nikolaeva

2. Institute/enterprise/company/NGO: Institute of Fishing Resources-Varna
3. Address: 4, "Primorski" Blvd., P.O. Box 72 Varna, 9000, Bulgaria
   Office Tel.: +359 /52/ 257876   Fax: +359 /52/ 257876   Email: violetev@mail.varna.techno-link.com
   Home: Tel.: +359 /52/ 44 08 47   Fax.: Email:
4. Date and place of birth: 26.06.1961, Voditza, Varna destr., Bulgaria
5. Education and Specialisation:

<table>
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<tr>
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<th>University, Institute</th>
<th>Year: from - to</th>
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</thead>
<tbody>
<tr>
<td>University education</td>
<td>Odessa Hydrometeorological Inst., Dept. of Ocenology; Eng.Oceanographer</td>
<td></td>
</tr>
<tr>
<td>Ph.D</td>
<td>USSR Academy of Science – Institute of Oceanology “Shirshov”</td>
<td></td>
</tr>
<tr>
<td>Specialisation - IOC-DANIDA training course on the biology and taxonomy of marine</td>
<td>Copenhagen University, Denmark</td>
<td>1995</td>
</tr>
<tr>
<td>harmful microplankton</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training course for experts in Environmental Risk Assessment</td>
<td>Varna, Bulgaria</td>
<td>1998</td>
</tr>
<tr>
<td>MedCoast Training course on Beach management and water quality</td>
<td>Malta University, Valetta, Malt</td>
<td>1999</td>
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6. Principal field of interest: phytoplankton, ecology, modelling of complex marine ecosystems.
7. Professional employment in the institute/enterprise/company/NGO:

<table>
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<th>period: from - to</th>
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<th>Position</th>
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<tbody>
<tr>
<td>Institute of Fishing Resources-Varna</td>
<td>Head of Hydrobiology Lab</td>
<td></td>
</tr>
</tbody>
</table>

8. Scientific research (up to 15 titles in the area, concerned with global change)


Velikova, V. 1998. Long-term study of red tides in the Western part of the Black sea and their ecological modelling. -In: Harmful Algae (eds. Reguera,.B, et all), Xunta de Galicia and Intergovernmental Oceanographic Commission of Unesco. (in English)


Co-author of 3 Collective Books:

9. Participation in councils and commissions
10. Knowledge of languages: Russian, English, German, Ukrainian

Vlaskov, Vladimir Gavrailov

1. Scientific degrees: researcher
2. Institute/enterprise/company/NGO: Institute of Geography - Bulgarian Academy of Sciences
3. Address:
   Office   Tel.: +359/2/979 33 74   Fax: +359/2/70 02 04   Email:
   Home    Tel.: +359/2/978 68 40
4. Date and place of birth: 14.08.1961, Kazanlak, Bulgaria
5. Education and Specialisation:

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<th>Education, Specialisation</th>
<th>University, Institute</th>
<th>Year: from - to</th>
</tr>
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114
6. **Principal field of interest:** palaeogeomorphology, palaeoclimatology, human impact on natural environment

7. **Professional employment in the institute/enterprise/company/NGO:**

<table>
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<th>Position</th>
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<tr>
<td></td>
<td>Institute of Geography - Bulgarian Academy of Science</td>
<td>researcher</td>
</tr>
</tbody>
</table>

8. **Scientific research (up to 15 titles in the area, concerned with global change)**

   Studies on the development and characteristic features of the exogenic morphodynamic processes within the Wester Danube Plain

9. **Participation in councils and commissions**

10. **Knowledge of languages:** French, English, Russian, Spanish

11. **Computer literacy:** good

---

**Vurbanov, Marian Stoyanov**

1. **Scientific degrees:** PhD
2. **Institute/enterprise/company/NGO:** NHSMS “Akad. L. Chakalov”, Eco-club “Clean water”.
3. **Address:** Sofia-1164, Bigla str. 52, Bulgaria
   **Office Tel.:** +359 /2/ 62 82 63
   **Email:** npmg@bgcict.bg
   **Home: Tel.:** +359 /2/ 74 79 50
4. **Date and place of birth:** 02.04.1962, Bulgaria

5. **Education and Specialisation:**

<table>
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<tbody>
<tr>
<td>University education - Agronomist</td>
<td>SU “St. Kl. Ohridski”-geography</td>
<td></td>
</tr>
<tr>
<td>graduate study hydrology, water resources</td>
<td>Moscow State University “M. Lomonosov”-Russia</td>
<td>1988-1992</td>
</tr>
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6. **Principal field of interest:** hydrology, water resources, hydroecology, hydrochemistry

7. **Professional employment in the institute/enterprise/company/NGO**

8. **Scientific research (up to 15 titles in the area, concerned with global change)**

9. **Participation in councils and commissions**

10. **Knowledge of languages:** Russian, English

11. **Computer literacy:** intermediate

---

**Yancheva, Stiliana Dimitrova**

1. **Scientific degrees:** Associate Professor, PhD Eng.
2. **Institute/enterprise/company/NGO:** INSTITUTE OF WATER PROBLEMS, BULGARIAN ACADEMY OF SCIENCES
3. **Address:** “Ac. Georgi Bonchev” St., Bl.1, 1113 Sofia, Bulgaria
   **Office:** **Tel.:** +359 /2/ 713 24 86
   **Fax:** +359 /2/ 72 25 77
   **Email:** npmg@bgcict.bg
   **Home: Tel.:** +359 /2/ 71 09 23
4. **Date and place of birth:** Lazar Distr. Lovetch, Bulgaria
5. Education and Specialisation:

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<th>Year: from - to</th>
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<tbody>
<tr>
<td>Engineer in Civil Hydroengineering</td>
<td>University of Architecture, Civil Engineering and Geodesy, Sofia</td>
<td>1966</td>
</tr>
<tr>
<td>Specialisation</td>
<td>Institute of Water Problems of the Academy of Sciences of the USSR</td>
<td>1972</td>
</tr>
<tr>
<td>Ph D.</td>
<td>Institute of Water Problems, Bulgarian Academy of Sciences</td>
<td>1979</td>
</tr>
<tr>
<td>Diploma in Mathematics</td>
<td>Faculty of Mathematics and Mechanics - Sofia</td>
<td>1991</td>
</tr>
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6. Principal field of interest:
Optimal Operation of Water Resources Systems; Optimisation of Water resources utilisation; Mathematical Models, Algorithms and Computer Programmes for Operation of a single and linked Multi-Purpose Reservoirs and River Basins; Mathematical Methods, Dynamic, linear, and nonlinear Programming; Multiobjective Optimisation, Simulation, Engineering Hydrology as well as the Probability Theory and Statistics; Taking into account the Environmental Problems during the Process of Operation of water Resources Systems.

7. Professional employment in the institute/enterprise/company/NGO:

<table>
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<tr>
<td>1966-1969</td>
<td>designer in State Irrigation Authority-Branch Pleven</td>
<td>Engineer</td>
</tr>
<tr>
<td>1989-</td>
<td>Institute of Water Problems</td>
<td>Senior Researcher</td>
</tr>
<tr>
<td>1993-1996</td>
<td>Institute of Water Problems</td>
<td>Deputy Director</td>
</tr>
<tr>
<td>1994- 1997</td>
<td>Institute of Water Problems</td>
<td>Head of Department</td>
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8. Scientific research:


9. Participation in councils and commissions

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<tr>
<td>1990 - 1998</td>
<td>Scientific Council of Water Problems Bulgarian Academy of Sciences</td>
</tr>
<tr>
<td>1995 - 2000</td>
<td>Commonly Meeting of Bulgarian Academy of Sciences</td>
</tr>
</tbody>
</table>

10. Knowledge of languages: Russian, English

11. Computer literacy:

Zhivkov, Zhivko Vasilev

1. Scientific degrees: PhD, Ass. Prof.
2. Institute: Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE)
3. Address: 136, “Tzar Boris III” Blvd., Sofia 1618, Bulgaria
   Office Tel.: +359 /2/ 554 165   Fax: +359 /2/ 554 158   Email: riidhe@bgcict.acad.bg
   Home Tel.: +359 /2/ 715 404
4. Date and place of birth: 20.07.1949, Burlja, Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education - Agronomist</td>
<td>High Agricultural Institute, Sofia</td>
<td>1971-1976</td>
</tr>
<tr>
<td>PhD- Irrigation and Melioration</td>
<td>Institute of Soil Science Poushkarov, Sofia</td>
<td>1986-1990</td>
</tr>
<tr>
<td>International Postgraduate Training Course</td>
<td>University of Agriculture Nitra - Chechoslovakia</td>
<td>1986</td>
</tr>
<tr>
<td>English</td>
<td>Agricultural Academy, Sofia</td>
<td>1993</td>
</tr>
<tr>
<td>Training Course in irrigation Development and Water management</td>
<td>KOIKA, Korea, Seul</td>
<td>1996</td>
</tr>
<tr>
<td>Assessment of agriculture lands</td>
<td>MAFAR, Bulgaria</td>
<td>1998</td>
</tr>
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6. Principal field of interest: Irrigation Agriculture, Irrigation Scheduling and Agrotecnics Under Optimum and Water Deficit, Crop Rotation, Effective and Ecological Use of Irrigation Areas, Microirrigation of Fruit and Vegetable Crops,

7. Professional employment:

<table>
<thead>
<tr>
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<th>Position</th>
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</table>

117
1976 -1978 | Co-operative farm in Madan, Montana Destr | Agronomist
---|---|---
1978 - 1980 | Floriculture Institute in Sofia | Chief of the experimental field
1981 - 1995 | RIIDHE - Sofia | Research associate
1995 to now | RIIDHE, Sofia | PhD Ass. Prof., Head of Department
1995 to now | RIIDHE, Sofia | PhD Ass. Prof., Scientific Secretary

8. Scientific research (up to 15 titles in the area, concerned with global change)

9. Participation in councils and commissions:
10. Knowledge of languages: Russian, English
11. Computer literacy: - DOS, Word

Ziapkov, Luka Delchev

1. Scientific degrees: Prof, PhD
2. Institute/enterprise/company/NGO: Institute of Geography
3. Address: “G. Bonchev” St., Bl. 3, Sofia 1113, Bulgaria
   Office: Tel.: +359 /2/ 70 02 90
   Home: Tel.: +359 /2/ 58 80 02
4. Date and place of birth: 21.07.1932, Poibrjane, Panagurishte destr., Bulgaria
5. Education and Specialisation:

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<tr>
<td>University education - Geography</td>
<td>Sofia University &quot;St. Kliment Ohridski&quot;,</td>
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<tr>
<td>PhD</td>
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6. Principal field of interest: Hydrology
7. Professional employment in the institute/enterprise/company/NGO

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<th>Position</th>
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<tr>
<td></td>
<td>Institute of Geography - Bulgarian Academy of Science</td>
<td>Professor</td>
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8. Scientific research (up to 15 titles in the area, concerned with global change) researcher
9. Participation in councils and commissions

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IHDP Seed Grant Initiative Final Reports 1999-2000

| 1998- | National Committee of the International Hydrological Programme - UNESCO |

10. **Knowledge of languages:** French, Russian
11. **Computer literacy:** none

**Zlatunova, Daniela Slavcheva**

1. **Scientific degrees:** PhD in Hydrology
2. **Institute/enterprise/company/NGO:** Sofia University “St. Kliment Ohridski”, Bulgaria, Geology and Geography Faculty,
3. **Address:** Sofia University “St. Kliment Ohridski”, Geology and Geography Faculty, 15, Tzar Osoboditel Blvd., Sofia, 1504, Bulgaria.
   **Office Tel.:** +359 /2/ 93 08 217  **Fax:** +359 /2/ 44 - 64 - 87
   **Email:** zlatunova@gea.uni-sofia.bg
   **Home: Tel.:** +359 /2/ 961 21 06
4. **Date and place of birth:** 24.06.1960. Montana, Bulgaria
5. **Education and Specialisation:**

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<tr>
<td>University education</td>
<td>Sofia University “St. Kliment Ohridski”, Bulgaria Geology and Geography Faculty, Department of Climatology and Hydrology</td>
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<tr>
<td>PhD in Hydrology</td>
<td>Geographical Institute, Bulgarian Academy of Science</td>
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</table>

6. **Principal field of interest:** Hydrology and Climatology
7. **Professional employment in the institute/enterprise/company/NGO**
8. **Scientific research (up to 15 titles in the area, concerned with global change)**

- Stoyanova, N., A. Delcov, D. Lasarova, D. Zlatunova at all, 1998 - Ecological Aspects of the Forest Ecosystems in the Middle Stara Planina with Connection in the River, Papers, Scientific Conference with International Participation, 6-7 October, Sofia
- Zlatunova, D., 1998 - The quantitative Variation of the Chemical Composition of the River Waters in Bulgaria, Papers, 100 Anniversary of Geography at Sofia University, International Scientific Conference, 14-16 May, Sofia

9. **Participation in councils and commissions**
10. **Knowledge of languages:**
11. **Computer literacy:** very well
Appendix 4

“Capacity Building for Bulgarian Human Dimension Programme”

Inventory of the projects related to HD and GEC

<table>
<thead>
<tr>
<th>No</th>
<th>Title</th>
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<tbody>
<tr>
<td>1</td>
<td>A modelling of sustainable urban forest development – comparative study for Sofia and Birmingham (Implementation of UK concept of Urban &amp; Community Forest)</td>
<td>Petja Radovanova</td>
<td><a href="mailto:radovano@sf.icn.bg">radovano@sf.icn.bg</a></td>
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<tr>
<td>2</td>
<td>A study on artificial rain structure and its impact on soils</td>
<td>Nelly Gadjalska</td>
<td><a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a></td>
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<td>3</td>
<td>Agrometeorological relationships for crops yields forecasting and optimisation under irrigation</td>
<td>Spaska Kalcheva</td>
<td><a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a></td>
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<td>4</td>
<td>Assessments of the load and quality of the river sediment as well as the contemporary state of the river beds in North Bulgaria with respect to the environment protection in the Danube River basin catchment area.</td>
<td>George Gergov</td>
<td><a href="mailto:george.gergov@meteo.bg">george.gergov@meteo.bg</a></td>
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<tr>
<td>5</td>
<td>Better operation and management of irrigation systems</td>
<td>Nelly Gadjalska</td>
<td><a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a></td>
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<td>6</td>
<td>Bulgaria Country Study to Address Climate Change</td>
<td>Christo Christov</td>
<td><a href="mailto:nks@enpro.bg">nks@enpro.bg</a></td>
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<td>7</td>
<td>Bulgaria energy balances and GHG emissions projections for period 1996-2020</td>
<td>Christo Christov</td>
<td><a href="mailto:nks@enpro.bg">nks@enpro.bg</a></td>
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<td>8</td>
<td>Bulgaria GHG Inventory and developing of the Third National Communication on UNCCC</td>
<td>Christo Christov</td>
<td><a href="mailto:nhv@enpro.bg">nhv@enpro.bg</a></td>
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<td>Bulgaria GHG Inventory for 1990-1994. Comparison of the IPCC and CORINAIR methodologies</td>
<td>Christo Christov</td>
<td><a href="mailto:nhv@enpro.bg">nhv@enpro.bg</a></td>
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<td>Christo Christov</td>
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<td>Challenges to sustainable development in Bulgaria</td>
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<td>Climatic and airlogical characteristics of the territory and air space of Zambia for the period April – October concerning the advanced flight preparations.</td>
<td>Ratchev, Georgi</td>
<td><a href="mailto:ratchevg@ns.unisofia.bg">ratchevg@ns.unisofia.bg</a></td>
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<td>13</td>
<td>Complex study on the regularities in the formation and forecastings of the run-off and the inflow to the Koprinka reservoir.</td>
<td>Marin Genev</td>
<td><a href="mailto:Marin.Guenev@meteo.bg">Marin.Guenev@meteo.bg</a></td>
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<tr>
<td>14</td>
<td>Conflict Resolution and Local Community Capacity Building: The cases of tobacco workers in Benkovski; the Sapareva Banya protest; the Mugla protest; the Rakitovo timber problem and clashes</td>
<td>Dainov, Evgeni</td>
<td><a href="mailto:CSPRact@usa.net">CSPRact@usa.net</a></td>
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<tr>
<td>15</td>
<td>Danube Integrated Environmental Study -</td>
<td>Tzankov,</td>
<td>riidhe@mail.techno-</td>
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<td>Phase I and II</td>
<td>Nikolay</td>
<td>link.com</td>
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<td>16</td>
<td>Dynamics of food standing stock and commercial fish resources in the Black Sea</td>
<td>Stoiko Stoikov <a href="mailto:ifr@abcis.bg">ifr@abcis.bg</a></td>
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<td>17</td>
<td>Ecological assess of the Final project for the extension of the object “Black Sea - 2” 2. Terms: 1991 - 1992</td>
<td>Georgi Ratchev <a href="mailto:ratchevg@ns.unisofia.bg">ratchevg@ns.unisofia.bg</a></td>
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<tr>
<td>18</td>
<td>Ecological - economic evaluation of irrigation systems</td>
<td>Nelly Gadjalska <a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a> <a href="mailto:RIIDHE@technolink.com">RIIDHE@technolink.com</a></td>
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<tr>
<td>19</td>
<td>Ecological Aspects of management and operation of drainage systems</td>
<td>Plamen Petkov <a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a> <a href="mailto:RIIDHE@technolink.com">RIIDHE@technolink.com</a></td>
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<td>20</td>
<td>Ecological technologies for sustainable yields from irrigated crops in the regions of the IV agro-climatic group</td>
<td>Jivko Jivkov <a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a> <a href="mailto:RIIDHE@technolink.com">RIIDHE@technolink.com</a></td>
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<td>21</td>
<td>Elaborating of a System of Measure as an Unitary Ecological Politic in the Jantra River Basin</td>
<td>Ivan Penkov <a href="mailto:zlatunova@gea.unisofia.bg">zlatunova@gea.unisofia.bg</a></td>
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<tr>
<td>22</td>
<td>Erosion-safely technologies for irrigation on the slope terrenes</td>
<td>Svetla Rousseva <a href="mailto:svetrou@yahoo.com">svetrou@yahoo.com</a></td>
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<td>23</td>
<td>Experiences with the impact of subsoil compaction on soil nutrition, crop growth and environment and ways to prevent subsoil compaction.</td>
<td>Dainov, Evgeni <a href="mailto:CSPract@usa.net">CSPract@usa.net</a></td>
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<td>24</td>
<td>FAO review of irrigation subsection in Bulgaria(for reorganisation of co-operative farm to many private farms)</td>
<td>Christo Christov <a href="mailto:nhh@enpro.bg">nhh@enpro.bg</a></td>
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<td>25</td>
<td>Feasibility Study on the Establishment of River Basins in Bulgaria</td>
<td>Draga Toncheva <a href="mailto:draga@sofiaonline.com">draga@sofiaonline.com</a></td>
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<td>26</td>
<td>Human capital and Mobility Programme</td>
<td><a href="mailto:cha@infomex.bg">cha@infomex.bg</a></td>
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<td>27</td>
<td>Hydro-ecological assessment of the water resources in the region of an energetic complex called “Maritza-Iztok”</td>
<td>George Gergov <a href="mailto:George.gergov@meteo.bg">George.gergov@meteo.bg</a></td>
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<td>28</td>
<td>Hydrological assessment of the Rila Mountain Water Resources</td>
<td>George Gergov <a href="mailto:George.gergov@meteo.bg">George.gergov@meteo.bg</a></td>
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<td>Hydrological forecastings of the run-off</td>
<td>Marin Genev <a href="mailto:Marin.Guenev@meteo.bg">Marin.Guenev@meteo.bg</a></td>
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<td>Improvement of the drainage technologies and melioration of agricultural land with high levels of water table under the new land ownership conditions.</td>
<td>Plamen Petkov <a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a> <a href="mailto:RIIDHE@technolink.com">RIIDHE@technolink.com</a></td>
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<td>Peter Dimitrov</td>
<td><a href="mailto:dimitrov_peter@hotmail.com">dimitrov_peter@hotmail.com</a>, <a href="mailto:riidhe@bgcict.acad.bg">riidhe@bgcict.acad.bg</a></td>
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<td>Introduction of P-Free detergents in Danube river basin countries</td>
<td>Boytcho Tenev</td>
<td><a href="mailto:water@mail.technolink.com">water@mail.technolink.com</a></td>
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<td>36</td>
<td>Investigation of the acid precipitation over the region of Sofia</td>
<td>Vurbanov, Marin</td>
<td><a href="mailto:nmg@bgcict.bg">nmg@bgcict.bg</a></td>
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<td>Landscape and ecological expert examination of the project for the extension of “Babino” mine belonging to the Power – Station of “Bobov Dol”.</td>
<td>Georgi Ratchev</td>
<td><a href="mailto:ratchev@ns.unisofia.bg">ratchev@ns.unisofia.bg</a></td>
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<td>Landscape map of Bulgaria on the scale of 1: 200 000</td>
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<td>Management of Irrigation under Water Deficit Conditions</td>
<td>Peter Dimitrov</td>
<td><a href="mailto:dimitrov_peter@hotmail.com">dimitrov_peter@hotmail.com</a>, <a href="mailto:riidhe@bgcict.acad.bg">riidhe@bgcict.acad.bg</a></td>
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<td>Methods for environmental assessment of irrigation and drainage systems</td>
<td>Nelly Gadjalska B. Tenev</td>
<td><a href="mailto:RIIDHE@bgcict.acad.bg">RIIDHE@bgcict.acad.bg</a></td>
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<td>Methods for protection of the environment in irrigation systems</td>
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<td>Microclimatic and ecological research of the region of Zone B 5.</td>
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<td>43</td>
<td>Monitoring, information system and measures for erosion control of the agricultural lands – I</td>
<td>Svetla Rousseva</td>
<td><a href="mailto:svetrou@yahoo.com">svetrou@yahoo.com</a></td>
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<td>Monitoring, information system and measures for erosion control of the agricultural lands – II</td>
<td>Svetla Rousseva</td>
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<td>National Climate Change Action Plan</td>
<td>Christo Christov</td>
<td><a href="mailto:nhh@enpro.bg">nhh@enpro.bg</a></td>
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<td>46</td>
<td>Observation, evaluation and prediction of the sheet water erosion in the country</td>
<td>Elka Tzvetkova</td>
<td><a href="mailto:svetrou@yahoo.com">svetrou@yahoo.com</a></td>
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<td>47</td>
<td>Open Flows Irrigation Systems Management</td>
<td>Peter Dimitrov</td>
<td><a href="mailto:dimitrov_peter@hotmail.com">dimitrov_peter@hotmail.com</a>, <a href="mailto:riidhe@bgcict.acad.bg">riidhe@bgcict.acad.bg</a></td>
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<td>Problem-oriented evaluation of the S&amp;T potential in field of environmental protection in Bulgaria and Ukraine.</td>
<td>Katia Simeonova</td>
<td><a href="mailto:ksimeonova@sofianet.ne">ksimeonova@sofianet.ne</a></td>
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<td>Prognosis of Land Reclamation in Bulgaria up to 2005 year</td>
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<td>Project for irrigation extension service for private farmers in Bulgaria, VOCA (Volunteers in Overseas Co-operative Assistance)</td>
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<td>Public Hearing on Water Management Draft Law</td>
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<td>Staneva, Marieta</td>
<td><a href="mailto:mps5@psu.edu">mps5@psu.edu</a></td>
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<td>Reform in Water Management and Sustainable Development Activities in South Bulgaria</td>
<td>Dainov, Evgeni</td>
<td><a href="mailto:CSPPract@usa.net">CSPPract@usa.net</a></td>
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<td>Rehabilitation of irrigation systems under</td>
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new conditions of farming

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<td>54</td>
<td>Restructuring and ecological aspects of irrigation systems</td>
<td>Nelly Gadjalska</td>
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<td>55</td>
<td>Seminar for International Co-operation on Waste Management</td>
<td>Ralitsa Karamisheva</td>
<td><a href="mailto:rdk@elits.rousse.bg">rdk@elits.rousse.bg</a></td>
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<td>56</td>
<td>Some unfavourable aspects of the climate of the Danube River plain</td>
<td>Marin Genev</td>
<td><a href="mailto:Marin.Guenev@meto.bg">Marin.Guenev@meto.bg</a></td>
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<td>Bojidara Mladenova</td>
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<td>59</td>
<td>System for water monitoring and sustainable management based on</td>
<td>Agop Hachikyan</td>
<td><a href="mailto:ahh@vmei.acad.bg">ahh@vmei.acad.bg</a></td>
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<td>Svetla Rousseva</td>
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<td>The 1982-1994 drought period in Bulgaria - an analogue for future</td>
<td>Knight, C.G.</td>
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<td>Water Quality Protection and Management of Maritza river basin</td>
<td>Tzankov, Nikolay</td>
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<td>Knight, C.G.</td>
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A modelling of sustainable urban forest development – comparative study for
Sofia and Birmingham (Implementation of UK concept of Urban & Community Forest
Terms: 1988-2000
Chief of the team: Petja Radovanova, PhD, Research Co-ordinator
Base organisation: Union of Park & Landscape Specialists in Bulgaria
Co-operations: University of Central England
Contact person: Petja Radovanova
Tel.: + 359 /2/ 51 84 24 Email: radovano@sf.icn.bg
Address: 29-2, “Metlichina poljana” St., Sofia 1404, Bulgaria
Contracting Agency:
Source of funding: Open Society Institute, Praha
Projected outlay:

**Abstract:** The basic idea of a project laid on the UK sound concept of multi-purpose community forest, but the project goes further to overcome the problem that there are many contradictions in the way that public perceive the role of urban forest. The project develops a theoretical base for understanding multipurpose role of the forest.

First - urban forest is a part of global vegetative cover, which has major role for protecting nature and human life. Second – urban forest is a factor for prosperous economic development and regeneration policy. Third – urban forest maintain thriving community and supports community development. Forth, urban forest enhances landscape and protects urban wildlife.

The project aims to achieve more practical objectives by collaboration with other actors – local authorities, public agencies, non-governmental organisations, private companies and individuals. The final paper will take into account not only concerns, but the reasons behind the differences of interests between the more global issues, public perceptions and expectations of urban forest and economic implications concern urban forest development. The paper will help for the future development of policy towards sustainable urban development, land and forest use in Bulgaria.

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**Assessments of the load and quaility of the river sediment as well as the contemporary state of the river beds in North Bulgaria with respect to the environment protection in the Danube River basin catchment area.**

**Terms:** 1992-1994

**Chief of the team:** George Gergov Prof., DrSc

**Base organisation:** National Institute of Meteorology and Hydrology

**Co-operations:**

**Contact person:** George Gergov Prof., DrSc

**Tel.:** +359 /2/ 975 33 49; +359 /2/ 975 39 86-88 / 355

**Email:** Georgi.Gergov@meteo.bg

**Address:** 66, Tzarigradsko Shaussee Blvd, Sofia 1784, Bulgaria

**Contracting Agency:** National Institute of Meteorology and Hydrology - BAS

**Source of funding:** Bulgarian Academy of Sciences (BAS)

**Projected outlay:**

Abstract: The sediment load of the Bulgarian tributaries of the Danube River and its dynamics have been revealed. The states of the river beds and their changes under the anthropogenic impact have been analysed for any of the river basins. The assessments of the impact have been made.

---

**A study on artificial rain structure and its impact on soils**

**Terms:** 1999-2001

**Chief of the team:** Dimitar Davidov, Prof., Dr.S

**Base organisation:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria

**Co-operations:**

**Contact person:** Nelly Gadjalska, Ass. Prof., PhD

**Address:** 136, "Tzar Boris III" Blvd., Sofia 1618, BULGARIA

**Tel.:** +359 /2/ 55-11-12

**Email:** ridhe@bgcict.acad.bg

**Contracting Agency:** National Science Fund, Ministry of education, science and technologies

**Source of funding:** National Science Fund, Ministry of education, science and technologies

**Projected outlay:** 10000 Lv

**Abstract:** On the bases of the experimentally received rain structure parameters a method for selecting the sprinkler equipment as well as their technical parameters
should be developed according to the soil type and their erosion sustainability. The final product will be a measurement system and method for assessment and evaluation of the ecological and energetically characteristics of the rain structure of sprinkler equipment.

**Agrometeorological relationships for crops yields forecasting and optimisation under irrigation**

**Terms:** 1996-1998  
**Chief of the team:** Spaska Kalcheva, Ass. Prof., PhD  
**Base organisation:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria  
**Co-operations:** INRA, France  
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**Contracting Agency:** National Center for Agricultural Sciences (NCAS)  
**Source of funding:** National Center for Agricultural Sciences (NCAS)  
**Projected outlay:** 7000 Lv  
**Abstract:** A comparison between the evapotranspiration with three different climate factors (methods of temperature, Blaney-Criddle and Penman-Monteith, respectively) is made.

**Better operation and management of irrigation systems**

**Terms:** 1996-1999  
**Chief of the team:** Dimitar Davidov, Prof., Dr. of Science  
**Base organisation:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria  
**Co-operations:**  
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**Contracting Agency:** National Center for Agricultural Sciences (NCAS)  
**Source of funding:** National Center for Agricultural Sciences (NCAS)  
**Projected outlay:** 180000 Lv  
**Abstract:** The project addresses the problems for water resources modelling in irrigation systems, irrigation management under conditions of water deficit and new forms of land ownership as well as computer programmes for water-yield relationship and wind impact in the process of irrigation.

**Bulgaria energy balances and GHG emissions projections for period 1996-2020**

**Terms:** 1999-2000  
**Chief of the team:** Temenuga Manoilova, Research Associate and Christo Vassilev, Senior Research Associate, Ph. D.  
**Base organisation:** Energoproekt PLC  
**Co-operations** NSI, NEC and CE  
**Contact person:** Christo Vassilev, Senior Research Associate, Ph. D  
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**Address:** 51, “J. Boucher” Blvd, Sofia 1407, Bulgaria  
**Contracting Agency:** NEC  
**Source of funding:** NEC  
**Projected outlay:** 39500 lv
Abstract: At the first stage of the project basic scenarios for energy development, providing stability and security at minimised economic expenses are proposed. The main characteristics of these scenarios are diversifying of the resources, applying of different energy technologies, increasing of the share of the local fuels, improving of energy effectiveness of the production and consumption. When developing the scenarios, a system of models for integrated energy planning from the programme complex ENPEP and the models Energy 2020 and IRP Manager are applied. The received power grid, in which the energy flows of production and consumption are bound and balanced, allows passing the next, second stage of the project - “GHG emissions and air pollutants determination for the period of planning till the year of 2020”. The following, basic activities were carried out:

- correcting and renovating the data for the parameters of fuels and technologies of burning, according to requirements of the module IMPACTS from the programme complex ENPEP;
- forming of technological and exploitation data for reduction of the emissions of dust and SO₂;
- preparing and transforming of the power grid to work with the module for assessment of the emissions – IMPACTS.
- determination of the prognosis emissions of GHG with module IMPACTS in the following, basic branches:
  - electricity and heat production;
  - energy transforming industries;
  - fuel consumption for energy aims in: industry, agriculture and forestry, transport, household and services;
  - fugitive emissions in the coal extraction and production and distribution of oil and gas.

One of the major results of the project would be developing of measures for the reduction of the emissions and alternative plans for fulfilling of duties of the country for environmental conservation.


Terms: 1997 - 1997
Chief of the team: Christo Vassilev, Senior Research Associate, Ph. D
Base organisation: Energoproekt PLC
Co-operations:
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Address: 51, “J. Boucher” Blvd., Sofia 1407, Bulgaria
Contracting Agancy: MOSW
Source of funding: MOSW
Projected outlay: 2090 lv

Abstract: IPCC methodology is characterised as an open system that could be added, improved and modified in regard to the circumstances of the countries-users of the methodology. These national circumstances could be: mix and quality of the natural resources, technology level, dynamic of the economic growth, national statistics practices, methods to provide information services and others. This is why the objective of first section of the report is to analyse the approaches to implement the IPCC methodology in Bulgaria circumstances and to adapt part of the suggested methods and data (emission factors, structure of the GHG emission sources and others).

In order to achieve this objective the following principals are implemented: precise implementation of the structure and logic of the IPCC methodology; priority use of the local data on the type and the main characteristics of the GHG emission sources.
(heat content, emission factors, technology for fuel combustion, economic practices and others); application of the data, given in the Guidelines in case, when such data are not available in the country; The GHG inventory is carried out according to two standard methodologies. Those are the methodology of the European Union – CORINAIR and the methodology of the Intergovernmental Panel on Climate Change – IPCC.

The IPCC methodology is orientated to emissions of GHG from all regions of the world, while the CORINAIR is implemented only within the boundaries of Europe. Both of the methodologies in their final and accessible to us version, according to the Guidelines for their use are discussed in the third part of the project. The IPCC-94 and CORINAIR94 are compared in theoretical and methodological aspect.

On implementing of the comparative analysis of the results of 1994 inventory, the following formulations are accepted: The emission quantities of the basic GHG – CO$_2$, N$_2$O and CH$_4$ and the gases – precursors CO, NO$_x$ and MVOC are compared according to the IPCC and CORINAIR methodologies. The main elements of the inventory process are analyzed. Those are: structure and classification of the sources of GHG; quantities of fuels and kinds of processes emitting GHG; emission factors. On analyzing of the emission factors, different values which are recommended and implemented by the IPCC and CORINAIR94 are compared. The influence of the aggregation degree according to kinds of fuels, kinds of technologies and kinds of vehicles (for the sub sector “Transport”) on the differences in the emitted quantities of GHG is analyzed according to both of the methodologies.

**Bulgaria GHG Inventory for 1997**

*Terms*: 1999-1999

*Chief of the team*: Christo Vassilev, Senior Research Associate, Ph. D

*Base organisation*: NPK Elen

*Co-operations*

*Contact person*: Christo Vassilev, Senior Research Associate, Ph. D

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*Contracting Agency*: MOSW

*Source of funding*: MOS W

*Projected outlay*: 4 600 000 lv

*Abstract*: This report contains inventory of greenhouse gas emissions for Bulgaria in 1997. Emissions are determined on the base of the total energy balance and the capacity of the main productions and activities resulting in GHG emissions. Major data sources for the activity data used in the emissions/sink estimates, such as consumed quantity of fuels, products use/production in different branches of economy, households, and other, are as follows:

- aggregate energy balance of Bulgaria for 1997;
- material balance of produced and consumed quantities raw and other materials;
- statistics of Road Police Office for the number and type of motor vehicles;
- reported data for the condition of forests (growth and cut of wood mass);
- reported data for the condition and production of food in agriculture;
- Specific data are taken from the National Statistic Institute, the Ministry of Internal Affairs and the Ministry of Agriculture and Forestry.

Some of the most important data in GHG inventory are the characteristics of the activities, technologies and processes that are GHG emission sources. These characteristics are directly related to the emissions of GHG. They influence the emission factors and a number of other parameters and assumptions used in the analytic calculation of the GHG emissions.
Current inventory is based on country specific emission factors, analytically and experimentally grounded, as well as on default parameters and data recommended by the IPCC Guidelines. For some cases default data from the methodology of European Union CORINAIR94 are used, as far as they are included in the Revised 1996 IPCC Guidelines.

**Bulgaria GHG Inventory and developing of the Third National Communication on UNFCCC**

**Terms:** 1999- 2001  
**Chief of the team:** Christo Christov, Senior Research Associate, Ph. D  
**Base organisation:** Energoproekt PLC  
**Co-operations** NSI, NEC, Energy Agency, BAS  
**Contact person:** Christo Christov, Senior Research Associate, Ph. D  
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**Email:** nhh@enpro.bg  
**Address:** 51, “J. Boucher” Blvd, Sofia 1407 Bulgaria  
**Contracting Agency:** MOSW  
**Source of funding:** MOSW  
**Projected outlay:** 16560 lv  

**Abstract:** The work on the project is organised in several stages, during which researches in the following directions will be conducted:

1. **Inventory for 1995 of the other GHG, included in the Kyoto Protocol.** Collecting and processing of information for the sources and consumers of the new GHG.  
   Choice of methodology for assessment of the new GHG, combined with reporting on the actualisation of the methodical materials of IPCC.  
   Structuring of the emissions of the new GHG, according to the classification of the IPCC Revised Guidelines and the new requirements of UNFCCC.

   Correcting the information of the sources and sinks of GHG, according to the reports of National Statistical Institute (NSI), Ministry of Agriculture and Forestry and Road Control Department of Ministry of internal affairs and other sources of information.  
   Actualisation of the indexes for indicating of the GHG emissions – emission factors, included sources and others, aiming at more accurate indicating of the emissions.  
   Comparing the trends of the GHG emission variation, regarding assessment of the accuracy, sequences of the applied methodologies and the clearness of the results.

3. **GHG Inventory in Bulgaria for the period of 1998 – 1999.** Collecting and processing of information for the working regime of the production capacities, sort and quantity characteristics of the fuel and effectiveness of energy transformation, non-energetic production processes, agriculture, collecting and treatment of wastes, etc.  
   Analysis of the emission characteristics of the existing and new technologies of production and consumption.  
   Estimating of the emissions, according to sectors and gases. Sink assessment.  
   Comparing the appendix of sector methods (of type Tier 2/3) for GHG inventory to express methods (of type Tier 1).

4. **Preparing of the “Third national communication of Bulgaria on climate change”**  
   National, social and economic, and demographic characteristics.  
   Inventory of the emissions and sinks of GHG in Bulgaria.  
   Policies and measures for reduction and mitigation of GHG emissions.  
   Prognoses for the GHG emissions and assessment of the effect of the GHG mitigation measures.
Expected influence on climate change, evaluation of the vulnerability and measures for adaptation of agriculture and forestry.
Review of the work on Joint Implementation projects.
Updating of the information for research activities, carried out in Bulgaria, in the field of climate change.
Education programmes and public awareness on climate change and the possible mitigation measures.
Preparation of project for the Third national report and submit it for discussion.

**Bulgaria Country Study to Address Climate Change**
Terms: 1993-1996
Chief of the team: Christo Christov, Sen. Res. Associate, Ph. D.
Base organisation: Energoproekt PLC
Co-operations: INRE, NIH, IE and FI at BAS, NEC, Energoproekt, National Laboratories in Burcly, Argonne, Brookhaven in USA, RCG Hagler Bailly
Contact person: Katja Simeonova, co-ordinator, Ph.D
Tel. +359 /2/ 68 80 34  Email: nks@enpro.bg
Address: 51, “J. Boucher” Blvd, Sofia 1407, Bulgaria
Contracting Agency: USDOE
Source of funding: US DOE
Projected outlay: $210,000

**Abstract:** The Republic of Bulgaria has declared its target not to exceed the level of the anthropogenic greenhouse gas emissions from 1988 in 2000. The President of USA, Bill Clinton, announced the US Country Studies Initiative to Address Climate Change in implementation of the USA commitments as a Party of FCCC in 1992. Bulgaria was one of the first countries to participate in this initiative and the corresponding programme with a project entitled “Bulgaria Country Study to Address Climate Change”.

**Key objectives of the study**
The key objective of the study is to support governmental institutions and ministries in formulating and implementing national policy pursuant to the Bulgarian commitments as a Party to the FCCC. The main results were designed to serve as the primary source to prepare and present the First Bulgarian communication to the UN FCCC Secretariat. Practically all problems that should be addressed in the national communication have been addressed in the study as well:

- The following greenhouse gases are considered in the study: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) and precursors including: carbon monoxide (CO), nitrogen oxides (NOₓ) and non-methane volatile organic compounds (NMVOC). During the study period, and in parallel with the main study objectives, a transfer of internationally recognised methods and software to solve different tasks of the project was accomplished. A series of consultations on implementing the methodologies and software with the leading US institutions and laboratories have been carried out, including:
  - ICF incorporated for methods and software for greenhouse gas inventory;
  - Argonne National Laboratory and RCG Hagler Bailly for methods and software for vulnerability and adaptation estimates;
  - Lawrence Berkley Laboratory, Argonne National Laboratory and Brookhaven National Laboratory for methods and programmes for technical and economic evaluation of mitigation measures as well as to project the greenhouse gas emissions.

As a result of methodology transfer and capacity building the team of Bulgarian experts is now capable of reporting on all areas in regard to the Bulgarian implementation of FCCC requirements after the project is completed.
Pursuant to the formulated objectives of the study a structure of the project was elaborated that allowed to solve the problems in a priority that corresponded to Bulgaria’s specific conditions. Therefore, the project was structured into following elements:

Greenhouse gas inventory in Bulgaria, co-ordinated by the National Institute of Meteorology and Hydrology of the Bulgarian Academy of Sciences (BAS) and Energoproekt with participation of the Ministry of Environment, Institute of Automobile Transportation, and the Institute for Soil Research and Forest Research Institute of BAS.

Assessment of the forest greenhouse gas off-set potential. Vulnerability to climate change and adaptation measures for Bulgarian forest and agriculture vegetation. Climate change mitigation in the non-energy sector, co-ordinated by the Forest Research Institute of BAS with participation of the National Institute of Meteorology and Hydrology of BAS and Forest University.

Macroeconomic and energy demand alternatives to mitigate greenhouse gas emissions - co-ordinated by Institute of Nuclear Research and Nuclear Energy with participation of the Institute of Economics of BAS and experts from the Ministry of Industry, Ministry of Territorial Development, Civil Engineering and Building, Research Institute for Agricultural Electrification, Ministry of Transport and Energoproekt.

Alternative energy balances and technology programmes to mitigate greenhouse gas emissions, co-ordinated by Energoproekt with participation of the National Institute of Meteorology and Hydrology and National Electric Company.

Dissemination of the results, co-ordinated by Energoproekt.

Final report (executive summary), co-ordinated by Energoproekt.

**Challenges to sustainable development in Bulgaria.**

**Terms:** 1998.

**Chief of the team:** Vasil Marinov, Assoc. Prof., PhD

**Base organisation:** NCRDHP – “Triadiza” 3A

**Co-operations:**

**Contact person:** Vasil Marinov, Assoc. Prof., Dr,

**Tel.:** +359 /2/ 9800312

**Email:**

**Contracting Agency:** Centre for social practices

**Source of funding:** UNDP "CAPACITY 21"

**Projected outlay:**

**Abstract:** This project has been assigned by the United Nations Development Programme within the framework of the "Capacity 21" programme aimed at promoting the process of sustainable development in Bulgaria through activities in various directions. One of these objectives is the institutionalisation of the sustainable development activities through establishing a national commission on sustainable development and national strategy for sustainable development in accordance with the guidelines of the Conference on Environment and Development in Rio de Janeiro (1992). It may be considered as a chief objective in this context.

**Climatic and airlogical characteristics of the territory and air space of Zambia for the period April – October concerning the advanced flight preparations.**

**Terms:** 1986 - 1987

**Chief of the team:** Georgi Ratchev, Assoc. Prof. Ph. D.

**Base organisation:** Sofia University “St Kliment Ohridski”

**Co-operations:** Non

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**Contracting Agency:** Bulgarian Airlines “BALKAN”

**Complex study on the regularities in the formation and forecastings of the run-off and the inflow to the Koprinka reservoir.**  
**Chief of the team:** George Gergov, Prof., DrSc  
**Base organisation:** National Institute of Meteorology and Hydrology  
**Co-operations:** GGY - St. Petersburg  
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**Contracting Agency:** National Institute of Meteorology and Hydrology - BAS  
**Source of funding:** Bulgarian Academy of Sciences (BAS)  
**Projected outlay:**  
**Abstract:** The changes of the climatic elements over the lake and the surrounding area have been studied. The intensity of both the air and water temperature, the humidity, the wind etc have been under investigation. The data have been collected by a long-distance remote sensing and automatic in time transfer. The annual inflow to the lake has been calculated and forecasted. A special survey of the reservoir’s impact on the environment has been conducted.

**Conflict Resolution and Local Community Capacity Building: The cases of tobacco workers in Benkovski; the Sapareva Banya protest; the Mugla protest; the Rakitovo timber problem and clashes**  
Terms: 1995-1996  
**Chief of the team:** Evgenii Dainov, Associate Prof.  
**Base organisation:** Centre for Social Practices  
**Co-operations:**  
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**Address:** 4, Dunav St., Sofia 1000, Bulgaria  
**Contracting Agency:** NOVIB - Holland  
**Projected outlay:** 738 lv  
**Abstract:** At the end of 1994, the interim government of Ms Reneta Indjova decided to build the “Djerman-Skakavitsa derivation”, a two-kilometre pipe taking water out of the river Skakavitsa and into the then empty reservoir of Iskar, from which the capital Sofia drew its water. The problem, to which the pipe was heralded as a solution, was that, using the lack of law and order in the country, some organised interests had simply drained Iskar, leaving the capital city on the verge of evacuation, with a stiff water regime of “6 hours on – 36 hours off”. The pipe was built in direct violation of the then environment protection legislation, under which such things could only be constructed following a preliminary independent investigation into the likely environmental impact, and after consultation with the local population. Moreover, the derivation was part of a larger scheme to divert waters from Mount Rila – a scheme known as “VK – Rila”, protests against which had been instrumental in sparking off the 1989 democratic rebellion. This fact alone, plus the humiliating water “regime” in the capital at the time, immediately ensured nationwide coverage of anything to do with the derivation. Following several months of tension between locals and the government, the Socialist Cabinet of Jean Videnov (who succeeded Ms Indjova at the beginning of 1995) continued to push ahead with building the pipe. The locals...
erected barricades at which pitched battles with special police detachments were fought. As part of our study, several months after these battles, the Centre for Social Practices organised a series of on-site round tables which brought together all sides concerned: the locals, the municipality, central government, the police and the media. Ultimately, in order to turn the impulse of the initial rebellion into a long-term factor, the members of the Initiative Committee who led the rebellion at Sapareva Banya – the main town around which barricades were erected – founded the “Sapareva Banya Foundation”.

A case illustrating a classic trajectory of civic development: from rebellion to organisation.
The book “The Government and the People. Conflicts in Bulgarian Society in the Middle of the 1990s” has been published in Bulgarian and in English as part of the project.

Danube Integrated Environmental Study - Phase I and II
Terms: 1993-1994
Chief of the team: Ivan Varlev, Prof. Dr.S.
Base organisation: Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria
Co-operations: Institutions from Austria, Hungary, Rumania, Chech Republic, Germany, Ukraine
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Address: 136, “Tzar Boris III” Blvd., Sofia 1618, Bulgaria
Contracting Agency: University of Technology, Vienna
Source of funding: PHARE programme
Projected outlay: 40,000 Lv
Abstract: For the assessment of pollution the approach MFA Material Flow Analyses /Material Accounting Methodology/ng was used.

Dynamics of food standing stock and commercial fish resources in the Black Sea
Terms: permanent
Chief of the team: Stoiko Stoikov, Ass.Prof., Dr.
Base organisation: Institute of Fishing Resources – Varna
Co-operations:
Contact person: Stoiko Stoikov, Ass.Prof., Dr.
Tel.: +359 25 78 76 Fax: +359 25 78 76 Email: ifr@abcis.bg
Address: 4, “Primorski” Blvd, Varna 9000, Bulgaria
Contracting Agency: Agricultural Academy – Sofia
Source of funding: Agricultural Academy – Sofia
Projected outlay: $ 72799
Abstract: The long-term routine monitoring and management of data includes studies on a seasonal or monthly basis (Varna region) on bacterioplankton, phytoplankton, zooplankton, benthic communities, hydrochemistry in the Bulgarian Black Sea waters – Varna and Beloslav lakes, Varna Bay, Bourgas Bay, in front of Capes Galata and Emine (up to 30 miles offshore). Special attention is paid to commercial fish resources, their stocks, population dynamics, genetic investigations, and changes in the whole food web structure related to environmental major shifts (natural and man-made influence).
**Ecological Aspects of management and operation of drainage systems**

**Terms:** 1996-2000  
**Chief of the team:** Plamen Petkov, Ass. Prof., PhD  
**Base organisation:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria  
**Co-operations:**  
**Contact person:** Plamen Petkov, Ass. Prof., Ph.D  
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**Tel.:** +359 /2/ 563 001 +359 /2/ 554 158  
**Email:** RIIDHE@bgcict.acad.bg  
**RIIDHE@techno-link.com**  
**Contracting Agency:** National Center for Agricultural Sciences (NCAS)  
**Source of funding:** National Center for Agricultural Sciences (NCAS)  
**Projected outlay:** 255000 Lv  
**Abstract:** On the basis of the available information and results from experimental and analytical studies that were carried out, an assessment have been made concerning the drainage systems potential to protect ground and surface waters from contamination with effluents from agricultural activities. Also watercourses, in which the drainage water is discharged, have been studied as well as the condition of the wetlands. Appropriate ecological and technological decisions for the management and operation of the drainage systems have been sought.

**Ecological assess of the Final project for the extension of the object “Black Sea-2”**

**Terms:** 1991 - 1992  
**Chief of the team:** Prof. D. Georgi Shishkov  
**Base organisation:** Sofia University “St. Kliment Ohridski”  
**Co-operations:**  
**Contact person:** Assoc. Prof. Ph. D. Georgi Ratchev,  
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**Financing organisation:** K O P S  

**Ecological - economic evaluation of irrigation systems**

**Terms:** 1995-1998  
**Chief of the team:** Nelly Gadjalska, Ass. Prof., PhD  
**Base organisation:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria  
**Co-operations:**  
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**Email:** riidhe@bgcict.acad.bg  
**Contracting Agency:** National Center for Agricultural Sciences (NCAS)  
**Source of funding:** National Center for Agricultural Sciences (NCAS)  
**Projected outlay:** 230000 Lv.  
**Abstract:** The economic and ecological criteria and coefficients for assessment of the impact on the environment in the irrigation and drainage systems are given in the project. The factors that influence the environment are defined. A mathematical model has been created for multi-criteria optimisation of the alternative decisions when making ecological-economic assessment.

**Ecological technologies for sustainable yields from irrigated crops in the regions of the IV agro-climatic group**

**Terms:** 1995-2000  
**Chief of the team:** Jivko Jivkov, Ass. Prof., PhD
Base organisation: Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria
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Contracting Agency: National Center for Agricultural Sciences (NCAS)
Source of funding: National Center for Agricultural Sciences (NCAS)
Projected outlay: 200000 Lv
Abstract: Carrying out multiannual field studies on growing cereals, vegetables, technical crops, orchards and berries gives us the opportunity, under particular agro-climatic conditions, fertilisation and irrigation, to develop technologies for sustainable ecological production of agricultural crops.

Elaborating of a System of Measure as an Unitary Ecological Politic in the Jantra River Basin
Terms: 1986-1988
Chief of the team: Assoc. Prof. Trifon Kundev
Base organisation: Tarnovo University “St. Kiril and Metodiy”
Co-operations: National Institute of Meteorology and Hydrology - Bulgarian Academy of Science, Institute of Geography - Bulgarian Academy of Science, Regional Survey of Environmental Protection.
Contact person: Ivan Penkov, Assist. Prof.
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Address: Sofia University “St. Kliment Ohridski”, Geology and Geography Faculty, 15, “Tzar Osvoboditel” Blvd., Sofia 1504, BULGARIA.
Contracting Agency: Committee of Environmental Protection (Ministry of Environment)
Source of funding: Committee of Environmental Protection (Ministry of Environment)
Projected outlay:
Abstract: The aim of the project was a complex analysis of the anthropogenety impact on the natural components in the Jantra river basin and their ecological condition. The geochemical background of rocks and soils was investigated, and on this basis the groups of contemporary landscapes with intensive anthropogenety impact were differentiated. The kinds of pollution and the basic causes were examined. It has been established that surface water in the Jantra river basin has been subjected to intensive pollution. The condition of the air is becoming worse and the noise pollution of the cities is increasing as a result of anthropogenety activity.

Experiences with the impact of subsoil compaction on soil nutrition, crop growth and environment and ways to prevent subsoil compaction.
Terms: 1998 - 2001
Chief of the team: Svetla Rousseva, Sen. Res. Assoc, PhD
Base organisation: “N. Poushkarov” Research Institute for Soil Science and Agroecology
Co-operations: INCO-COPERNICUS Concerted Action Project
Contact person: Svetla Rousseva, Sen.Res.Assoc, PhD
Tel.: 359 /2/ 667 930 Email: svetrou@yahoo.com
Address: “N. Poushkarov” RISSA, 7, “Shosse Bankya” St., Sofia 1080, Bulgaria
Contracting Agency: European Comission
Source of funding: European Comission (Contract No ERB IC15-CC98-0125 (DG12-CDPE))
Projected outlay: 6210 EURO
Abstract: The project aims at:
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bringing together experts from several European Union Member-States (EU), Countries of Central Europe (CCE) and the New Independent States (NIS – former USSR) in order to create a representative working group on subsoil compaction and its effects on nutrients behaviour;
contributing to an economically and environmentally friendly agriculture;
effectively disseminating the results throughout the European countries, both from EU and from CCE and NIS, by publications, harmonisation of determination methods and of pedotransfer functions and creation of databases;
preserving existing knowledge and experience in CCE and NIS;
correlating the activities within this INCO-COPERNICUS Project to a comparable one involving most EU countries in the FAIR Programme.

Feasibility Study on the Establishment of River Basins in Bulgaria
Terms: July 1, 1998 - October 30, 1998
Chief of the team: Evgenii Dainov, Associate Professor
Base organisation: Centre for Social Practices
Co-operations: Ministry of Environment and Waters, National Assembly Environment and Waters Committee, Bulgarian Academy of Science, UNDP
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Address: 4, Dunav St., fl.1, Sofia 1000, Bulgaria
Contracting Agency: NOVIB - Holland
Projected Outlay: $ 7496
Abstract: The feasibility study on the establishment of river basins in Bulgaria was based on the analysis of documents, provided by governmental institutions, by NGOs, by the media and by a public opinion survey. The idea for this type of study emerged on the basis of particular experience CSP acquired in overcoming the conflict connected with the construction of the "Jerman - Skakavitsa" derivation. In the final analysis it turned out that the roots of the conflict stemmed from ineffective action that was unco-ordinated with the European requirements and the criteria for sustainable development administration of Bulgarian waters. Meanwhile, the idea for river basin establishment received support among other NGOs working in this field, and after some time the idea reflected on the drafting of a Water Law. The main objective of this study was to find out to what extent we could talk in the contemporary categories of stakeholders in the present Bulgarian conditions, i.e. the shared administration of water by all sides with vital interest in it. In this respect part of the study was targeted on citizens' activity in the decision-making process concerning water administration and to what extent citizens are prepared to play a part in the establishment of future river basins.
Project activities: - Document collection from the Ministry of Ecology; Analysis of NGO materials; Media analysis; Meeting partners; Fieldwork; Drafting programme seeking donors for the implementation of a pilot basin council in the river valley of Struma; Workshops; Round table discussion.

First and Second National Communication on Climate Change
Terms: 1996-1998
Chief of the team: Christo Christov, Senior Research Associate, Ph. D.
Base organisation: Energoproekt PLC
Co-operations: BAS, KAT,MOS W
Contact person: Christo Christov, Senior Research Associate, Ph. D
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Contracting Agency: MOSW DOE of US

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Source of funding: MOS W and DOE of US
Projected outlay: $ 110000

The First National Communication of Bulgaria was elaborated by the Interministerial Committee and supported by independent organisations and experts. The work was co-ordinated by the Ministry of Environment and Energoproekt PLC. It was submitted to the UN FCCC Secretariat in February 1996.

The Second National Communication is a further step in elaborating and implementing the national climate change policy. It was delivered after the Kyoto Conference of the Parties. According to Annex B of the Kyoto Protocol the quantified emission reduction commitment of Bulgaria for the first commitment period (2008-2012) is 8 % of the base year (1988) emissions. Currently this commitment is being discussed by the governmental institutions. The preliminary studies show that it would be extremely difficult to achieve this target. It will require the pursuit of a consistent policy and the application of measures to reduce GHG emissions once the transition period is over and the recovery of the economy starts. Major problems to achieve the target are associated with the lack of funds to support mitigation measures and projects. International collaboration and partnership will be essential for meeting the reduction target.

The Second Communication is elaborated following the Guidelines adopted by the Second Conference of the Parties of the Convention. It develops the findings presented in the First Communication, supplemented and refined during the development of the National Climate Change Action Plan in the frame of the US Country Study Programme - Support for National Action Plans.

The Second National Communication of Bulgaria was elaborated by the Interministerial Committee and supported by independent organisations and experts. The work was co-ordinated by the Ministry of Environment and Waters and Energoproekt PLC.

Genetic epidemiology of the urinary tract tumors in patients with Balkan endemic nephropathy
Terms: 1998-2001
Chief of the team: Helmut Mann, Professor
Base organisation: Technical University of Aachen
Co-operations: Technical University of Aachen, Federal Republic of Germany, Medical University Sofia, Bulgarian Academy of Sciences, Rijksuniversiteit Utrecht, Netherlands
Contact person: Draga Toncheva, Associate Professor
Tel.: +359 /2/ 517 202 Email draga@sofiaonline.com
Address: Department of Medical Genetics, Medical University Sofia, University Hospital of Obstetrics and Gynecology 2, Zdrave Str., Sofia 1431, Bulgaria
Contracting Agency: European Community,
Source of funding: INCO-COPERNICUS project
Projected outlay: $250 000
Abstract: The aim of the project is to identify the genetic background predisposition and progression of the familial urinary tract tumors (FUTT) in patients with Balkan endemic nephropathy (BEN). FUTT/BEN are of great clinical importance in the
restricted areas of Bulgaria, Romania, Croatia, Serbia, Slovenia, Bosnia and Hercegovina. The distinctive FUTT/BEN characteristics (familial syndrome, multiple localisation and bilateral development of the tumors, a female predominance and chromosome aberrations) are suggestive of a multifactorial etiology of the disease (polygenic disease). So far, the limited studies on the etiological factors for tumorogenesis in FUTT/BEN patients have not discovered a single exogenous causative agent or any genetic bases of this puzzling disease. The role of genetic factors for the development of the FUTT/BEN disease will be studied by investigating the significance of 3q25 marker, determining the type and the frequency of chromosomal aberrations in tumor cells and analysing the breakpoints that generate structural chromosomal abnormalities and disturb the function of the refuge genes, studying mutations in tumor suppressor genes (p53, VHL) and oncogenes (NRAS, KRAS, RAF1), their incidence and possible biological implications, studying genetic heterogeneity of possible predisposing factors (CYP 450 1A1, 2D6, 2E1, GSTµ, GSTθ, NAT2) and biotransformation of nephrotoxins, investigating defects in the host’s immune system and conducting virological studies of material from BEN patients for isolation of viral agents. New information about the genetic changes that can be correlated with the initiation or progression of FUTT/BEN or with clinical outcome may derived from the modern epidemiological studies of populations at risk by cytogenetic, molecular-cytogenetic, molecular-genetic and virological and immunological methods. In theoretical respect we expect that the results of this study will allow identification of susceptible individuals and might raise the possibility to screen patients at increased risk for FUTT/BEN. This new research will make possible the future impact of molecular biology on FUTT/BEN diagnosis, prognosis and treatment.

Geo – ecological assess of the environmental conditions at the regions around Power – Station I, Power – Station III and the “coal factory” in the Energy Complex “Maritsa Iztok”

Terms: 1994 - 1996
Chief of the team: Proff. PhD. Georgi Shishkov
Base organisation: Sofia University “St Kliment Ohridski”
Co-operations: Contact person: Assoc. Proff. Ph. D. Georgi Ratchev
Address: Office: Tel. +359 /2/ 9308 362 E-Mail: ratchevg@ns.uni-sofia.bg
Contracting Agency: Minproect
Source of funding:
Projected outlay:
Abstract:

Human Capital and Mobility Programme

Terms: 1995-1998
Chief of the team: DSci Roger Bettess
Base organisation: Hydraulic Research, Wallingford, the UK
Co-operations: National Institute of meteorology and Hydrology - Bulgarian Academy of Sciences
Contact person: Prof. Dsci. George Gergov, NIMH - BAS,
Address: NIMH - BAS, 66, “Tzarigradski” Blvd, Sofia 1784, Bulgaria
Office: Tel. +359 /2/ 975-39-86; E-Mail: george.gergov@meteo.bg
Home: Tel. +359 /2/ 72-77-92 E-Mail: g_gergov@mtel.net
Contracting Agency: European Commission on Environment
Source of funding: European Union
Projected outlay:
Abstract: The programme involves complex research aiming at creating new technologies, adding to scientific knowledge about nature and assisting the design of the systems and facilities to protect humankind from catastrophic events, supporting the conservation of river environments, and raising knowledge about the environment.

**Hydro-ecological assessment of the water resources in the region of an energetic complex called “Maritza-Iztok”**

**Terms:** 1998-1999  
**Chief of the team:** Prof. Dsci George Gergov, NIMH _ BAS  
**Base organisation:** County Radnevo  
**Co-operations:** National Institute of meteorology and Hydrology - Bulgarian Academy of Sciences  
**Contact person:** Prof. DSci George Gergov, NIMH - BAS,  
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**Office:** Tel. +359 /2/ 975-39-86;  
**E-Mail:** george.gergov@meteo.bg  
**Home:** Tel. +359 /2/ 72-77-92  
**E-Mail:** g_gergov@mtel.net  
**Contracting Agency:** County Radnevo  
**Source of funding:** County Radnevo  
**Projected outlay:**

Abstract: The water resources of the Saslijka River, the main regularities of its regime, quality characteristics and the changes due to the anthropogenic impact have been studied. These include the formation of the river run-off, the spread of the water pollution and the changes in temperature and precipitation over the area of a large energetic complex.

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**Hydrological assessment of the Rila Mountain Water Resources**

**Terms:** 1994-1995  
**Chief of the team:** George Gergov, Prof., DSci  
**Base organisation:** NGO “Green Patrols”  
**Co-operations:** National Institute of meteorology and Hydrology - Bulgarian Academy of Sciences  
**Contact person:** Prof. DSci George Gergov, NIMH - BAS,  
**Address:** NIMH - BAS, 66, “Tzarigradski” Blvd, Sofia 1784, Bulgaria  
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**E-Mail:** george.gergov@meteo.bg  
**Home:** Tel. +359 /2/ 72-77-92  
**E-Mail:** g_gergov@mtel.net  
**Contracting Agency:** NGO “Green Patrols”  
**Source of funding:** NGO “Green Patrols”  
**Projected outlay:**

Abstract: Based on new hydrological information about the Rila mountain water resources a periodicity in the hydrological regime has been revealed and a sharp decrease in the water excess since 1978-80. It is has been accepted as a strong long-term drought everywhere in the region during the period 1981-95. This is why the water resources have been reduced by 28 to 41 % with respect to a normal hydrological period. It became obvious and easy to evaluate the role and the size of water diversions for hydropower in the East Rila area. The influence of the climate change impact on the run-off has been discussed.

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**Hydrological forecastings of the run-off**

**Terms:** 1983-1986  
**Chief of the team:** Ass. Prof. PhD Marin Genev  
**Base organisation:** National Institute of Meteorology and Hydrology - BAS
Co-operations: GMS - Moscow
Contact person: Ass.Prof. PhD Marin Genev
Tel.: +359/2/ 975 33 49; +359/2/ 975 39 86-88 / 355
Email: Marin.Guenev@meteo.bg
Address: 66, Tzarigradsko Shaussee Blvd, Sofia 1784, Bulgaria
Contracting Agency: National Institute of Meteorology and Hydrology - BAS
Source of funding: Bulgarian Academy of Sciences (BAS)
Projected outlay:
Abstract: The long-term fluctuations of both the river discharge and the inflow to some large reservoirs have been studied. They have revealed the considerable significance of snow and rainfall feeding of the run-off. Based on a dynamical-statistical model seasonal and annual forecasts have been developed. Their accuracies have been proved by statistical criteria.

Improvement of the drainage technologies and melioration of agricultural land with high levels of water table under the new land ownership conditions
Terms: 1991-1995
Chief of the team: Plamen Petkov, Ass. Prof., PhD
Base organisation: Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria
Co-operations: “Irrigation Systems” Ltd.
Contact person: Plamen Petkov, Ass. Prof., Ph.D
Address: 136, “Tzar Boris III” Blvd., Sofia 1618, Bulgaria
Tel. +359 /2/ 563 001 +359 /2/ 554 158 Email: RIIDHE@bgcict.acad.bg
RIIDHE@techno-link.com
Contracting Agency: National Center for Agricultural Sciences (NCAS)
Source of funding: National Center for Agricultural Sciences (NCAS)
Projected outlay: 220000 Lv
Abstract: Studies have been carried out to determine the condition and functioning of drainage systems and to specify the operation and maintenance problems resulting from returned ownership rights. New design methodologies and technological decisions for drainage systems construction and usage have been developed under the conditions of logged and saline agricultural lands as well as their management according to the new socio-economic conditions in the agricultural sector and the country.

Introduction of P-Free detergents in Danube river basin countries
Terms: 1994-1995
Chief of the team: Ivan Varlev, Prof. Dr.S.
Base organisation: Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria
Cooperations: Institutions from Hungary, Romania, Chech Republic, Germany, Austria
Contact person: Boytcho Tenev, Scientific Researcher
Address: 136, “Tzar Boris III” Blvd., Sofia 1618, Bulgaria
Tel.: +359 /2/ 55 11 31 Email: water@mail.techno-link.com
Contracting Agency: Senator Consult Ltd., Hungary
Source of funding: PHARE programme
Projected outlay: 12000 Lv
Abstract: The investigation was carried out on detergent production in Bulgaria and detergent usage in Bulgaria as well as P-contamination in detergents. The level of P in the sludge and water was investigated. As a result of the project, a proposal has
been made for the implementation of P-free production of detergents in Eastern Europe.

**Integrated Management of Water and Fertilisers with System Analysis**

**Terms:** 1996-1998  
**Chief of the team:** Erma Ikonomova, Professor, DSc, Institute for Soil Sciences and Agroecology “N. Pushkarov”  
**Base organisation:** Institute for Soil Sciences and Agroecology “N. Pushkarov” and Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria  
**Co-operations:** Greece, Soil Science Institute of Athens  
**Contact person:** Peter Dimitrov, Associated Professor, PhD, RIIDHE  
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**Fax:** +359 /2/ 554 158  
**Email:** dimitrov_peter@hotmail.com, riidhe@bgcict.acad.bg  
**Contracting Agency:** National Center for Agricultural Sciences (NCAS)  
**Source of funding:** National Center for Agricultural Sciences (NCAS)  
**Projected outlay:** 50000 Lv  
**Abstract:** The objective was the evaluation of the use of irrigated water and nutrients in an agricultural environment. The main results of the project include mathematical models and software for water-soil resources - crops growth-yield - climate changes impact relationships, for irrigation and fertilisation and planning and management. Consideration was made of interrelation of basic phisicochemical factors in soil moisture and fertilisers various level in lysimeters and plant growth pots.

**Investigation of the acid precipitation over the region of Sofia**

**Terms:** 1996-2002  
**Chief of the team:** Marian Vurbanov, Ph.D  
**Base organisation:** National High School of Mathematics and Science “Akad. L. Chakalov”-Sofia, Eko-club “Clean Water”  
**Co-operations:** SU“St. Kl. Ohridski”, Laboratory of computer technologies in phisical geography  
**Contact person:** Marian Vurbanov, Ph.D  
**Tel.:** +359 /2/ 628 263  
**Email:** npmg@ bgcict.bg  
**Address:** 52, “Bigla” St., 1164 Sofia,  
**Contracting Agency:**  
**Source of funding:** personal finances  
**Projected outlay:**  
**Abstract:** The aim of the project is to investigate the spatial spreading of acid precipitation and to detect the factors causing the acidity. A permanent facility for observing and taking samples was established in the territory of Sofia. The results are processed by computer in collaboration with the laboratory of computer technologies in physical geography. As a result of this, map schemes and analyses for certain rainfall situations are created.

**Landscape and ecological expert examination of the project for the extension of “Babino” mine belonging to the Power – Station of “Bobov Dol”**

**Terms:** 1992 - 1993  
**Chief of the team:** Assoc. Proff. Sevdalina Valtcheva  
**Base organisation:** Sofia University “St Kliment Ohridski”  
**Co-operations:**
IHDP Seed Grant Initiative Final Reports 1999-2000

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Financing organisation: Minproect

Landscape map of Bulgaria on the scale of 1: 200 000
Terms: 1997-2000
Chief of the team: Peter Petrov, professor, PhD
Base organisation: Sofia University St. Kliment Ohridski, Faculty of Geology and Geography
Co-operations: Contact person: Peter Petrov, professor, PhD
Tel.: +359 /2/ 93 08 261, +359 /2/ 467 057 Email: tony@gea.uni-sofia.bg
Address: Sofia university St. Kliment Ohridski, Faculty of Geology and Geography, 15, Tzar Osvoboditel Blvd, Sofia 1504, Bulgaria
Contracting Agency: National Science fund, Ministry of education, science and technologies
Source of funding: National Science funds
Projected outlay: 825000 lv
Abstract: The major aim of the project is to work up is general scientific landscape map of the country. This purpose requires the solution of the following scientific objectives: Development of an actualised classification system of the contemporary landscapes on the territory of the country. Development of an author’s original of the landscape map of Bulgaria on the scale of 1: 200 000. Regionalisation of the territory of Bulgaria on the basis of the general scientific topological landscape map. Well-grounded proposals for effective use of the topological system and the landscape map for the environmental impacts assessment. The expected results are scientifically and practically important as an improved approach to the tupologisation and mapping of the landscape and will be used for the environmental impacts assessment.

Management of Irrigation under Water Deficit Conditions
Terms: 1997-1998
Chief of the team: Dimitar Davidov, Professor, DSc
Base organisation: Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria
Co-operations: Greece, Land Reclamation Institute
Contact person: Peter Dimitrov, Associated Professor, PhD
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Address: 136, Tzar Boris III Blvd., Sofia 1618, BULGARIA
Contracting Agency: National Center for Agricultural Sciences (NCAS)
Source of funding: National Center for Agricultural Sciences (NCAS)
Projected outlay: 30000 Lv
Abstract: The objective was to improve the methods, information base and software in irrigation management under deficit of resources (water, etc.). The main results of the project include mathematical models and software for: impact of climate changes on irrigation; irrigation scheduling planing and water resources management under water deficit conditions; meteorological factors - irrigation level - soil resources - crops growth - yield relationships.
**Methods for environmental assessment of irrigation and drainage systems**

**Terms:** 1994-1995  
**Chief of the team:** Nelly Gadjalska, Ass. Prof, PhD  
**Base organisation:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria  
**Co-operations:**  
**Contact person:** Nelly Gadjalska, Ass. Prof, PhD; B. Tenev, Researcher, eng-econ  
**Address:** 136, “Tzar Boris III” Blvd., Sofia1618, BULGARIA  
**Tel.: +359 /2/ 55-11-12. Email:** riidhe@bgcict.acad.bg  
**Contracting Agency:** National Center for Agricultural Sciences (NCAS)  
**Source of funding:** National Center for Agricultural Sciences (NCAS)  
**Projected outlay:** 200000 Lv.  
**Abstract:** In methodological guidelines are included detailed guides for preparation of environmental assessment of irrigation and drainage systems. The authors offer not only wide accepted standards and regulations but also their own tested on different systems methods, for prognosis and assessment of the environment. Methodology is developed for damage assessment and a plan for personal monitoring of the irrigation and drainage systems environment.

**Microclimatic and ecological research of the region of Zone B 5**

**Terms:** 1989 – 1990  
**Chief of the team:** Assoc. Prof., PhD Dimitar Toplijski  
**Base organisation:** Sofia University “St. Kliment Ohridski”  
**Contact person:** Assoc. Prof., PhD. Toplijski D., Assoc. Prof., PhD. Ratchev G.  
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**Monitoring, information system and measures for erosion control of the agricultural lands - I**

**Terms:** 1994-1998  
**Chief of the team:** Svetla Rousseva, Sen.Res.Assoc, PhD  
**Base organisation:** “N. Poushkarov” Research Institute for Soil Science and Agroecology  
**Co-operations:**  
**Contact person:** Svetla Rousseva, Sen.Res.Assoc, PhD  
**Tel.: 359 /2/ 667 930 Email:** svetrou@yahoo.com  
**Address:** “N. Poushkarov” RISSA, 7, “Shosse Bankya” St., Sofia 1080, Bulgaria  
**Contracting Agency:** Agricultural Academy  
**Source of funding:** Agricultural Academy (Project No 9/1994)  
**Projected outlay:** 668 Lv.  
**Abstract:** The main directions of the studies under the project cover investigation, modelling, and prediction of the soil erosion processes, studies on different types of measures for erosion prevention and systematisation and generalisation of the information about soil erosion observations. Three themes and 16 tasks are elaborated under the project. The experimental work is carried out in the field experimental bases for soil erosion studies near Russe, Topolovgrad, Suhodol and Mirkovo and the greenhouse of the Institute. for the aims of the project 14 field and 3 pot experiments are set up. Information needed for characterisation of the rainfalls, soil, runoff, crop and crop yields is obtained from the field experiments set up on plots of length ranging from 5 to 60 m and slope from 10 to 16.4 %.
Monitoring, information system and measures for erosion control of the agricultural lands - II
Terms: 1999-2003
Chief of the team: Svetla Rousseva, Sen.Res.Assoc, PhD
Base organisation: “N. Poushkarov” Research Institute for Soil Science and Agroecology
Co-operations
Contact person: Svetla Rousseva, Sen.Res.Assoc, PhD
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Address: “N. Poushkarov” RISSA, 7, “Shosse Bankya” St., Sofia 1080, Bulgaria
Contracting Agency: Agricultural Academy
Source of funding: Agricultural Academy (Project № 3/1999)
Projected outlay: 426300 Lv
Abstract: Both natural and land management conditions in Bulgaria set off groundings for high soil erosion risk of the agricultural lands. The aim of the studies on the project is to establish the bases for organising an effective erosion control of the agricultural lands, which are vulnerable to soil erosion. Twelve tasks are under consideration, thematically organised in three themes: Theme 1 “Organising soil erosion monitoring at diverse natural and management conditions”; Theme 2 “Design of information system for soil erosion predictions and control”; Theme 3 “Organising and efficiency of the soil erosion control at diverse landuse”.

National Climate Change Action Plan
Terms: 1998-1999
Chief of the team: Christo Christov, Senior Research Associate, Ph. D
Base organisation: Energoproekt PLC
Co-operations: BAS, NEC, Energoproekt, MOSW, NGO
Contact person: Christo Christov, Senior Research Associate, Ph. D
Tel.: +359 /2/ 68 0 34 Email: nhh@enpro.bg
Address: 51, “J. Boucher” Blvd., Sofia 1407, Bulgaria
Contracting Agency: MOSW
Source of funding: MOSW and DOE of US
Projected outlay: $ 80000
Abstract: The Conference of the Parties held in December 1997 in Kyoto, Japan is a further step in the process of solving the climate change issue. The scientific research and facts in the last few years set the necessity for new more stringent measures for GHG mitigation to be considered. Parties to the Conventions are ask not just to stabilise their emissions but also to lower them by a certain reduction index during the first commitment period (2008-2012). The target set for Bulgaria is 8% reduction.
Such a reduction requires timely development of mitigation measures and their implementation at different levels - households, region, state. The current Action plan is a set of such measures that will allow mitigation of GHG emissions from the national industry and households without adverse impacts on economic development and the lifestyle of the population.
Climate variation over short intervals, projected changes over a longer term, modified concentration of gases in the atmosphere as well as the changes in the land cover and ecosystems impact human health and status. The impacts cover all sectors of the economy, natural resources, social life (e.g. water resources, agriculture, fishery, energy sector, transport, financial and insurance services, coastal infrastructure). Generally, the human dimensions of climate change have three facets: human contribution to GHG emissions; the consequences of climate change impacting on human health and lifestyle; humankind could take measures to mitigate GHG emissions and to adapt to climate change.
The recommended Action plan takes into consideration these requirements and combines measures developed for sectors and sub-sectors into an uniform programme the implementation of which will guarantee meeting the obligations under UNFCCC and the Kyoto Protocol reduction target. The NCCAP provides a tool for meeting the national commitments, and it is characterised as follows: individual measures for the major economic sectors - from energy to forestry; integrated measures for GHG mitigation (mainly CO$_2$, but also CH$_4$ and N$_2$O); stimulation of investments in environmentally friendly technologies and energy saving initiatives; creating of new jobs related to GHG reduction, increase of sink potential, energy efficiency services, emission monitoring; setting up a programme that will be further developed for long term emission reduction.

**Observation, evaluation and prediction of the sheet water erosion in the country**

**Terms:** 1998-1998  
**Chief of the team:** Elka Tzvetkova Sen.Res.Assoc, PhD  
**Base organisation:** “N. Poushkarov” Research Institute for Soil Science and Agroecology  
**Co-operations:**  
**Contact person:** Elka Tzvetkova, Sen.Res.Assoc, PhD  
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**Email:** svetrou@yahoo.com  
**Address:** “N. Poushkarov” RISSA, 7, “Shosse Bankya” St., Sofia 1080, Bulgaria  
**Contracting Agency:** Ministry of the Environment and Waters  
**Source of funding:** Ministry of the Environment and Waters (Contract No 399/1849)  
**Projected outlay:** 8000 Lv.  
**Abstract:** Studies of varios soil, climate, landscape, vegetation and management conditions provide substantial information about the relationships between the factors that cause soil loss and those that reduce such losses. The aims of the studies under the project were: to obtain information about the factors and the appearance of erosion processes on the territory of the field experimental bases for soil erosion studies of RISSA “N. Poushkarov”, situated in various soil and climate regions of the country and to test the suitability of the equations for soil loss predictions proposed by Y. Daskalov in a project for a State Standard (BDS 17.4.4.02-96).

**Open Flows Irrigation Systems Management**

**Terms:** 1996-2000  
**Chief of the team:** Peter Dimitrov, Ass. Prof., PhD  
**Base organisation:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria  
**Co-operations:**  
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**Address:** 136, “Tzar Boris III” Blvd., Sofia 1618, BULGARIA  
**Contracting Agency:** National Center for Agricultural Sciences (NCAS)  
**Source of funding:** National Center for Agricultural Sciences (NCAS)  
**Projected outlay:** 75000 Lv.  
**Abstract:** The objective of the project is to secure flexible water supply on demand. Project results provide for: operational irrigation water quality control; methodologies, models and software for water distribution in irrigation systems with open channel networks and meteorological support to irrigation systems equipment.
Problem-oriented evaluation of the S&T potential in field of environmental protection in Bulgaria and Ukraine
Terms: 1999-2001
Chief of the team: Kostadinka Simeonova, Prof., Dsc.
Base organisation: CSSHS - BAS
Co-operations: Centre “G.M.Dobrov” - Ukraine
Contact person: Kostadinka Simeonova  Prof., Dsc.
Tel.: +359 /2/ 883 887     Email: ksimeonova@sofianet.net
Address: 4, “Serdika” St., Sofia 1000, Bulgaria
Abstract: The project aims at research of S&T potential (STP) in the field of environmental protection in Bulgaria and Ukraine. By scientometric approach and peer review the structure and dynamics of the development of the single components of STP will be established. The results could be applied to the formation of more effective science policy in this field, which is so important for the society.

Public Hearing on Water Management Draft Law
Terms: November 1998
Chief of the team: Evgenii Dainov. Associate Professor
Base organisation: Centre for Social Practices
Co-operations:
Contact person: Teodora Gandova
Tel.: +359 /2/ 981 72 22, +359 /2/ 980 81 70     Email: CSPact@usa.net
Address: 4, Dunav St., fl.1, Sofia 1000, Bulgaria
Contracting Agency:
Source of Funding: UNDP
Projected Outlay:
Abstract: This kind of public hearing took place for the first time in this country’s legislative history. The Ministry of the Environment and Waters (MEW) asked a non-governmental organisation, the Centre for Social Practices (CSP), to organise and hold the hearing in the presence of all stakeholders and interested parties, including MEW.
For this hearing CSP sent out invitations for participation and for written comments on the draft law to a large contingent of various stakeholders in the subject under consideration. Prior to the hearing the CSP received written papers specifically for the hearing: 20 of them were from NGOs, 5 from municipalities and 4 from central government institutions and academics.
The following were present at the public hearing itself: 23 NGOs; 28 municipalities; 28 central government institutions and agencies; 32 leading experts in the field; 11 media representatives. The hearing was attended by the Minister of Environment, Ms Evdokia Maneva, and her Deputy Ministers.
The participants agreed that the draft law under consideration was a worthy attempt to redefine water-related practices in line with EU philosophy and away from the old communist logic, under which water was deemed a resource for industry, energy and agriculture and was managed as such, with considerable damage to the environment. It was noted that bringing the management of the waters under one Ministry – and that being the Environment Ministry – was a major step in the direction of practices in line with the philosophy of sustainable development. At the same time, the overall view emerging out of the day-long discussion was that the draft law has not satisfactorily escaped from old concepts and practices, and contains a considerable number of gaps, contradictions and ambiguities.
All participants agreed to a suggestion made by the Centre for Social Practices to work for the setting up of a voluntary group (Water or Environment Reform Unit) of noted representatives from all institutions and groups who are stakeholders in the
water management process. This Unit would function as a nexus of information gathering and policy recommendation to the Ministry of Environment and Waters and other decision-making bodies.

**Public Perception of Global Change**

**Terms:** 1997-1999

**Chief of the team:** C.G. Knight, Prof. Dr.

**Base organisation:** CIRA

**Co-operations:** BAS – Institute of Sociology

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The Pennsylvania State University

University Park, PA 16802  http://www.essc.psu.edu/cira

**Contracting Agency:** NSF

**Source of funding:** US Government

**Projected outlay:** $8,000

**Abstract:** A project organised and carried out a comparative survey of the regional perception of climate change in Bulgaria subsequently to a similar study in the United States. This survey explored how different cultural and economic characteristics affect perception of climate change using Bulgaria as an example of a country with an economy in transition. It looks at how society will affect policies concerning the use of resources to ensure human security.

**Reform in Water Management and Sustainable Development Activities in South Bulgaria**

**Terms:** 2000-2001

**Chief of the team:** Evgenii Dainov, Associate Professor

**Base organisation:** Centre for Social Practices

**Co-operations:**

**Contact person:** Teodora Gandova

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**Contracting Agency:**

**Source of Funding:** German Marshall Fund

**Projected Outlay:** $ 49695

**Abstract:** With the assistance of the Centre for Social Practices, a Water Law was adopted a year ago. Under this law, water management is based on a river council principle. However, secondary legislation regulating the practical implementation of the law is yet to be developed. In accordance with the Water Law the territory of Bulgaria is devided into 6 large river councils whose practical operation will be extremely cumbersome. This is why the CSP proposes a project that sets out to initiate the establishment of a watershed council at Varbitsa River in the district of Kardjali, Southern Bulgaria. On the basis of the pilot watershed council a working model promoting dialogue and co-operation among the stakeholders in the region will be worked out. The Varbitsa council will encourage the involvement of individual citizens and NGOs from the region with a view to resolving conflict situations stemming from the water issue.

This is a project to begin transferring applicable aspects of the "Oregon experience" in water management to South Bulgaria with a view to stabilising the participation of the public and NGOs in decision-making and policy development.

The project has three basic pillars:
Peer exchange to expose representatives of key Bulgarian civic and official institutions to “the Oregon experience” and key Oregonian representatives to the Bulgarian situation in order to lay the ground for transfer of practices and experiences in the field of environmental (river management) policy at the local level. The implementation of the project will assist the involvement of the local problem resolution. The project will assist raising the environmental issues as a problem of civil society, which has the power and responsibility for its resolutions. Analysis of experiences and practices and working out of applicable institutional models for the participation of NGOs and the community in the formation and implementation of policy related to environment (river) management. The training of the local civil formation will assist their participation in the decision-making process. Holding a working meeting with stakeholders (NGOs, community groups, academics, media, educationalists and official institutions), in the presence of key Oregonians, to launch the implementation of the model of policy participation. The project will stimulate a dialogue in conflict resolution at civil organisational and public institutional level. The project will stimulate the process of opening up public institutions at government level to outside expertise and attracting the civil organisations.

**Restructuring and ecological aspects of irrigation systems**

**Terms:** 1996-2000  
**Chief of the team:** Gadjalska, Nelly, Ass. Prof., PhD  
**Base organisation:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria

**Co-operations:**  
**Contact person:** Nelly Gadjalska, Ass. Prof., PhD  
**Address:** 136, “Tzar Boris” III Blvd., Sofia 1618, BULGARIA  
**Tel.:** +359 /2/ 55-11-12. **Email:** riidhe@bgcict.acad.bg  
**Contracting Agency:** National Center for Agricultural Sciences (NCAS)  
**Source of funding:** National Center for Agricultural Sciences (NCAS)  
**Projected outlay:** 185000 Lv  
**Abstract:** The project addresses the problems connected with environmental protection in the irrigation systems. This includes: irrigation water quality, determination of the heavy metals and As impact on the ecosystem “water-soil-plant”, ecological aspects of sprinkling irrigation on the soil, and usage of ecological materials in protected zones. Mathematical models for ecological assessment of the systems have been developed.

**Seminar for International Co-operation on Waste Management**

**Terms:** September, 1999  
**Chief of the team:** Vladimir Tomow, Professor, PhD  
**Base organisation:** Ecole des Mines d’Ales, Ecole des Mines de St-Etienne  
**Co-operations:**  
**Contact person:** Ralitsa Karamisheva senior lecturer  
**Tel.:** +359 /82/ 279 23 **Email:** rdk@elits.rousse.bg  
**Address:** University of Rousse, Department of Env. Eng., 8, “Studentska” St, Rousse 7017, Bulgaria  
**Contracting Agency:**  
**Source of funding:** ADEME, France  
**Projected outlay:**  
**Abstract:**
**Study of the heavy metals impact in irrigation**

**Terms:** 1996-1999  
**Chief of the team:** Bojidara Mladenova, PhD  
**Base organisation:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria  
**Co-operations:** Institute for Soil Science “N. Pushkarov”  
**Contact person:** Bojidara Mladenova, Ph.D  
**Address:** 136, “Tzar Boris III” Blvd., Sofia1618, Bulgaria  
**Tel.:** +359 /2/ 555 307, +359 /2/ 55 981/235  
**Email:** ridhe@bgcit.acad.bg  
**Contracting Agency:** National Center for Agricultural Sciences (NCAS)  
**Source of funding:** National Center for Agricultural Sciences (NCAS)  
**Projected outlay:** 95000 Lv  
**Abstract:** Three-year experimental growing of maize for grain in lysimeters, irrigated with water with high content of Zn, Cu, Pb and Cu has been carried out. The objective was to determine the level of yield, soil and drainage water pollution.

**Some unfavourable aspects of the climate of the Danube River plain**

**Terms:** 1994 -1996  
**Chief of the team:** Ekaterina Koleva, Ass.Prof. PhD  
**Base organisation:** National Institute of Meteorology and Hydrology - BAS  
**Co-operations:**  
**Contact person:** PhD Marin Genev Ass.Prof.  
**Tel.:** +359 /2/ 975 33 49; +359 /2/ 975 39 86; 88 / 355  
**Email:** Marin.Guenev@meteo.bg  
**Address:** 66, Tzarigradsko Shaussee Blvd, Sofia 1784, Bulgaria  
**Contracting Agency:** National Institute of Meteorology and Hydrology - BAS  
**Source of funding:** Ministry of Education and Science  
**Projected outlay:**  
**Abstract:** The changes of the main climatic elements for the North Bulgarian region are studied. Based on this the prevailing types of the weather intrusions in different seasons are determined as well as the freezing of the rivers. An extensive assessment of the unfavourable climate development on the Danube River plain has been made.

**Systematisation of the information on soil erosion and mathematical modelling of the erosion processes**

**Terms:** 1994-1998  
**Chief of the team:** Yordan Daskalov, Sen.Res.Assoc, PhD /Svetla Rousseva, Sen.Res.Assoc, PhD  
**Base organisation:** “N. Poushkarov” Research Institute for Soil Science and Agroecology  
**Co-operations:**  
**Contact person:** Svetla Rousseva, Sen. Res. Assoc., PhD  
**Tel.:** 359 /2/ 667 930  
**Email:** svetrou@yahoo.com  
**Address:** “N. Poushkarov” RISSA, 7, “Shosse Bankya” St., Sofia 1080, Bulgaria  
**Contracting Agency:** Ministry of Education, Science and Technology  
**Source of funding:** NF NI (Contract No NI SS 424/94)  
**Projected outlay:**  
**Abstract:** Information from the studies on field runoff plots at various soil, climate, topography, vegetation and agrotechnical conditions serves as a base for designing models to predict soil loss due to water erosion, for soil conservation planning and for optimising the erosion control measures. This project aimed:
to build up a data bank for systematising and suitably organising information about soil erosion processes from the soil erosion experimental fields at the Research Institute for Soil Science and Agoeconomy “N. Poushkarov”, the Complex Experimental Station - Kardjali, the Institute for Mountain Agriculture and Stock-breeding - Troyan and the Institute for Barley – Karnobat; and to use the information included in the data bank for developing new mathematical models for soil erosion predictions.

**System for water monitoring and sustainable management based on ground stations and satellite images (WATERMAN)**

**Terms:** 1999 - 2001

**Chief of the team:** Agop Hachikyan, Assoc. Prof., Dr.

**Base organisation:** Technical University

**Co-operations:** University of Karlsruhe – Germany, Aristotle University of Thessaloniki – Greece

**Contact person:** Agop Hachikyan, Assoc. Prof., Dr.

**Tel.:** +359 /2/ 965 3285  
**Email:** ahh@vmei.acad.bg

**Address:** Technical University – Sofia, Faculty of Computer Systems and Control, 1756 Sofia, Bulgaria

**Contracting Agency:** European Commission, Programme COPERNICUS

**Source of funding:** European Commission, Programme COPERNICUS

**Projected outlay:** 230 000 EURO

**Abstract:** WATERMAN is a monitoring system in water management of the transborder rivers in the Southern Balkans. The rivers in this region have become extremely polluted as a result of industrial growth. This fact set the pattern for the need for their permanent monitoring. Therefore the project focuses on the analysis of water quality, sources of pollution as well as prognoses and recommendations about future industrial productions. Another aim of the project is forecasting, supporting and controlling the balance and the quantity of the water by observation of the snow cover in the catchment areas and of meteorological conditions. The main objective of the project is to create a Research Laboratory for Water Monitoring (RLWM). Research activity is directed to create a radio-computer system for the ground stations. The data from these stations together with the satellite information will be collected by RLWM. Hence another research area is how to organise and process these data for effective use by modern information technologies and knowledge-based decision-support systems. Valuations, hypotheses and actual information will be disseminated by Bulletin and Internet. All this information will be basically directed to the state institution and the governing body of the enterprises.


**Terms:** 1999 - 2001

**Chief of the team:** C.G.Knight, Prof.Dr.

**Base organisation:** CIRA – Penn State

**Co-operations:** BAS - NCGCC

**Contact person:** C. G. Knight, Prof. Dr.

**Tel.:** 814/ 863 8571  
**Email:** cgk@psu.edu

**Address:** Department of Geography, 302 Walker Building, The Pennsylvania State University, University Park, PA 16802 http://www.essc.psu.edu/cira

**Contracting Agency:** NSF

**Source of funding:** US Government
Projected outlay: $30,000

Abstract: A project studying impacts of the 1982-1994 drought in Bulgaria as a scenario for studying the human impacts of future climate change and its socio-economic impacts in Bulgaria. In the climate change forecasts for the Bulgarian there is agreement that significant warming will take place. What can the 1982-1994 drought event teach us about coping with future events? A team of Bulgarian researchers is assisted by CIRA colleagues to document the climatic, ecological, hydrological, sociological, economic, and political consequences of this period, the culmination of over a decade of increasingly dry conditions. We believe the analysis will substantiate the hypothesis that without the economic collapse after 1989 and consequent decrease in water demand, the drought event would have been truly catastrophic. From the 1993-94 analysis, the team will create two scenarios: the impacts of such a drought prior to 1989 when the economy was fully operational (prior to the 40-50% decrease in industrial activity and nearly 90% decrease in irrigated agriculture) and in 2020 when a recovered economy will again use larger water quantities.

The natural conditions for develop of the settlements (comparative characterisations between Bulgaria and Poland)

Terms: 1997-2000

Chief of the team: Peter Slaveikov, Assoc.Professor, PhD
Base organisation: Sofia University, Faculty of Geology and Geography
Co-operations: Warsaw University- Poland
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Contracting Agency: Sofia University and Warsaw University
Source of funding: Sofia University and Warsaw University
Projected outlay: 2000 lv and $1500

Abstract: The object of this project is to establish proof of the natural influence over the settlements in selected regions of Europe. Primary attention focuses on dependence between settlements, development and water resources. Quantitative and quality analysis reveals dependence between the size of the rivers in Poland and Bulgarian and size and density of the settlements, the distance from the sea and tendencies of socio-economic development of the settlements, etc.

The tendencies in the long term run-off changes of the rivers in Bulgaria

Terms: 1995 - 1998

Chief of the team: Marin Genev, Ass.Prof. PhD
Base organisation: National Institute of Meteorology and Hydrology
Co-operations:
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Address: 66, Tzarigradsko Shaussee Blvd, Sofia 1784, Bulgaria

Contracting Agency: National Institute of Meteorology and Hydrology
Source of funding: Ministry of Education and Science
Projected outlay:
Abstract: Complex assessments have been made of the temperature, precipitations and the river discharges in Bulgaria. This has revealed the primary and secondary periods in the changes of water excess as well as the influence of time series and grouping of the data. All diversions in the data sequences for the period 1961-1990
have been analysed and the percentages of precipitation reduction have been calculated.

**Training Modules in Innovation and Commerce for Environmental Technologies**

**Terms:** 2000 - 2001  
**Chief of the team:** Petar Donchev Professor, PhD  
**Base organisation:** ECOPOLIS, Portugal  
**Co-operations:**  
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**Address:** Department of Environmental Engineering, The University of Rousse, 8, “Studentska” St, Rousse 7017, Bulgaria

**Contracting Agency:** Programme Leonardo da Vinci, European Commission  
**Projected outlay:**  
**Abstract:** The aim of this project is to develop a training module for environmental technologies for needs of small and medium employers. The programme will be made according to European standards and ECTS.

**Water Quality Protection and Management of Maritza river basin**

**Terms:** 1996-1998  
**Chief of the team:** Ivan Varlev,.Prof. Dr.S.  
**Base organisation:** Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, Bulgaria  
**Co-operations:** Soil Science Institute “N.Pushkarov”, Institute for Water Problems, Ekoakvatex and others  
**Contact person:** Nikolay Tzankov, Scientific Researcher  
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**Email:** water@mail.techno-link.com  
**Address:** 136. “Tzar Boris III” Blvd., Sofia 1618, Bulgaria  
**Contracting Agency:** UNDP  
**Source of funding:** UNDP  
**Projected outlay:** 136000 Lv  
**Abstract:** Bulgaria’s role in pollution from point sources and non-point sources in the Maritza River Basin has been assessed. On the basis of the assessment, an action plan for the reduction of N and P pollution from agriculture, industry and population has been prepared.

**Yantra River Basin Model and a Decision Support System in a GIS Framework**

**Terms:** 1997 - 2001  
**Chief of the team:** C.G.Knight, Prof.Dr.  
**Base organisation:** ERRI-Penn State  
**Co-operations:** BAS- Institute of Water Problems  
**Contact person:** C. G. Knight, Prof. Dr.  
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**Email:** cgk@psu.edu  
**Address:** Department of Geography, 302 Walker Building The Pennsylvania State University, University Park, PA 16802 http://www.essc.psu.edu/cira.

**Contracting Agency:** NSF  
**Source of funding:** US Government  
**Projected outlay:** $ 120,000  
**Abstract:** This research is on modelling water pollution in the context of climate variability and change in the Yantra River basin of Bulgaria. It uses ERRI expertise
on geographic information systems (GIS) and pollution, along with CIRA's interest in water resources management and experience in Bulgaria and the Bulgarian Institute's on-site capabilities, to build a modelling/decision-support framework that could be used elsewhere. It involves a large research team in USA and in Bulgaria. An econometric decision-support model for pollution control draws upon new approaches to GIS modelling of point and non-point sources. The result of this study will be a GIS-based decision-support system that addresses these questions: If investments are made in pollution control at a certain place, where and to what degree will the stream quality goals be achieved? Vice-versa, to attain certain quality standards for a given reach (or reaches) of the basin, what alternative strategies could be implemented under various probabilistic levels of stream flow resulting from climatic variability and with input from the local community? The integrative character of the work and its transferability could link it to the Regional and Global Integrated Models.
Appendix 5

“Capacity Building for Bulgarian Human Dimension Programme”

Annotated bibliography of HD/GEC related authors and papers which shows "who is doing what" research

Abstract: Ecological information is orientation of the civilisation to survival of the humanity and solving of the global ecological problems by means of ubiquitous information. A mechanism for raising the effectiveness of information use is proposed.

Bulletin “Environment”, annual publication of the National Statistical Institute
Abstract: The Bulletin “Environmental Statistics” contains environmental data from annual statistical surveys. The information is systematised according to: emissions in the air, water abstraction, water supply, water use, waste waters, sewage treatment plants, industrial non-hazard waste, municipal and demolition waste, expenditure, tangible fixed assets with ecological use, noise, protected natural scenery, crimes committed with conviction against the environment and convicted persons. Data are aggregated by branch, territorial and geographical aspects. Information is presented in tables, graphics and thematic maps. The publication is of interest to the public, the Government, ecologists and economists.

Bulletin “Environmental Statistics”
Abstract: contains environmental data from annual statistical surveys. The information is systematised according to:
- emissions in the air;
- water abstraction, water supply, water use, waste waters, sewage treatment plants;
- industrial non-hazard waste;
- municipal and demolition waste;
- expenditure;
- tangible fixed assets with ecological use;
- noise;
- protected natural scenery;
- crimes committed with conviction against environment and convicted person.
Data are aggregated by branch, territorial and geographical aspects. Information is presented in tables, graphics and thematic maps. The publication is of interest to the public, the Government, ecologists and economists.

Abstract: The Bulgarian GHG emission profile reveals the energy sector as the most significant emission source and also as an area where great potential for GHG emissions reduction exists. Mitigation options in energy supply offered in the paper were selected by using expert estimates of the potential of fossil fuel substitution and new energy technology implementation considering the existing structure of energy systems and projects for mid- and long-term development. Basically, three modules of ENPEP were used: BALANCE - to calculate the energy flows and energy cost from primary fuel resources and fuel import to energy end-use, IMPACT - to calculate GHG emissions and ELECTRIC - to project the electricity system's long-term development.
Different mitigation measures combined in four scenarios were developed. The integrated mitigation scenario incorporated a mix of mitigation measures in the energy demand and supply. Implementation of CO2 mitigation measures both in energy demand and energy supply would reduce the 2020 emission level by 34.3 Tg (29.1%), i.e. 544.2 Tg (21.7%) for the entire study period 2000 - 2020 compared to the base-line scenario.


Abstract: Alternative energy balances aimed to mitigate greenhouse gas (GHG) emissions are developed as alternatives to the base-line energy balance. The section of mitigation options is based on the results of the GHG emission inventory for the 1987-1992 period. The energy sector is the main contributor to the total CO2 emissions of Bulgaria. Stationary combustion for heat and electricity production as well as direct end-use combustion amounts to 80% of the total emissions. The parts of the energy network that could have the biggest influence on GHG emission reduction are identified.

The potential effects of the following mitigation measures are discussed:
- rehabilitation of the combustion facilities currently in operation;
- repowering to natural gas;
- reduction of losses in thermal and electrical transmission and distribution networks;
- penetration of new combustion technologies;
- tariff structure improvement;
- renewable sources for electricity and heat production;
- waste-heat utilisation; and
- supply of households with natural gas to substitute for electricity in space heating and cooking.

The total available and the achievable potentials are estimated and the implementation barriers are discussed.


Abstract: GHG emission projections are an important part of the GHG mitigation studies. The projections include recommended GHG mitigation measures at sectional level.

The measures are arranged and integrated using technical and economic optimisation. The various measures are structured and ranked in accordance with the adopted macro-economic, technological and economic assumptions, presented as general development scenarios. In these scenarios the measures are linked and balanced using the planning methods of optimisation.

Since the energy sector is the major source of GHG emissions in Bulgaria, considerable attention is paid in the projections to the development of energy demand and supply.


**Abstract:** The aim of this study is to estimate the organic carbon sink of the soils in Bulgaria. Reported estimates are based on available data of organic carbon and bulk density measurements along the profile depths of different soil types. The total organic carbon sink of the soils in Bulgaria is estimated to 1.5 Gt. Nine soil orders (Histosols, Vertisols, Aridisols, Ultisols, Mollisols, Alfisols, Inceptisols, Entisols and Spodosols) occur in the territory of Bulgaria. Average organic carbon density of the
entire soil profile ranges from 6.7 to 33.0 kg m⁻². Inceptisols, Mollisols, Alfisols and Vertisols form 95.7 % of the total national organic carbon sink. Even though Bulgaria is a small country there is considerable variation in the soil organic carbon sink of different soils. The high variability in a small part of the World points to the need for more detailed national assessments to obtain a more reliable estimate of soil organic carbon sink.


Gadjalska, N., 1994. Private water users’ associations under the new conditions of agricultural land use, Agricultural Reform in Central and Eastern Europe Countries, Sofia.


**Gadjalska, N., R. Petrova, 1994.** Choice of the most convenient sprinkler equipment for the irrigation of grain forage crops on sloping lands, Scientific Works, Agricultural Academy, Vol. 1, Sofia

**Gadjalska, N., R. Petrova, 1994.** Irrigation management in Bulgaria under the conditions of land restitution, Proceeding from international conference: The possibilities of irrigation efficiency increasing, p. 221-224, VUZH, Bratislava


**Gadjalska, N., V. Slavov, 1994.** Using travelling gun sprinklers on sloping lands..17 European Regional Conference of Irrigation and Drainage, Vol 2, 16-22 May 1994, Varna, Bulgaria


**Genev, M., 1974.** Study of the link between the river wetness in Bulgaria and the indexes of the Solar activity and the atmosphere circularion. -Hydrology and Meteorology, ed. 6, p. 53 - 60

**Abstract:** The link between the run-off and the indexes of the Solar activities – Wolf numbers - has been studied by means of the correlogramme analyses. The options for hydrological forecastings are discussed.

**Genev, M., 1984.** Forecasting of the mean wetness of the Danube River. Hydrotechnic and meliorations, vol. 7, p. 4

**Abstract:** Based on a statistical model is discussed the possibility for the mean annual forecasting discharge of the Danube River in order to the intensive water consumption in the vegetation period.


**Abstract:** The modern concept in the formation and development of the hydrological processes and their cyclic time changes have been studied


**Abstract:** A contemporary theoretical concept of the random character of the run-off formation has been presented.


**Abstract:** The principal approach for the annual temperature, precipitation and run-off changes in South Bulgaria (Has been presented), p. 12
Abstract: An assessment of the annual run-off fluctuations of the Bulgarian tributaries of the Danube River is made. The main periods and trends in the run-off have been studied.

Abstract: Long term flow variations in Central North Bulgaria are investigated and the main periods of the water excess have been found.

Abstract: A vast and detailed study of the run-off changes for Bulgaria has been done taking into account the temperature, precipitation and run-off. The main trends in the studied elements have been established.

Genev, M., St. Stoyanov, 1981. Forecasting of the annual inflow to the reservoir “G. Dimitrov”. Hydrothecnics and meliorations, ed. 3, p. 3-6
Abstract: An attempt to study the river inflow information as a stochastic sequence in order of its annual forecasting.

Abstract: The changes in the run-off in Bulgaria are studied. A random assessment of the period of low water discharge in 1982-94 has been presented.

Abstract: Some changes in the main hydrological parameters are discussed after they arose due to the climate changes. Some of them were not applied appropriately when the new water supply system for Sofia was discussed. The failure in the water resources management of the Rila in the last few years has been revealed, and so have the negative consequences for the local inhabitants and the environment.

Abstract: The main results of the Koprinka reservoir study have been presented. The lake has been treated as a part of the landscape complex of the recent anthropogenesis

Abstract: A study on the richness and the variability of hydrological features of the country and its reflection in the scientific investigations, which have been carried out in Bulgaria, has been presented in the paper. The climate change impact on the hydrological phenomenon, which appears as long-term periodicity, has been assessed. The main regularities in the run-off formation and regime, discharge, space and temporary spread and distribution of hydrological parameters are developed. The subject of the study has been proved by means of diversity of
research methods of investigation. The study includes a rich critical review of the papers, published in this country or abroad, on the problems under investigation.


Abstract: The paper deals with the necessity for the studies of the large reservoirs in the country with respect to their links with the environment.


Abstract: The air and water temperatures affect the evolution of the living organisms, and they appear as a factor for oxygen solubility and self-cleaning of the flow. To a great extend they determine the application of the river water for industrial demands. The variation of the atmosphere temperature and precipitations during the long term period of drought occurred after 1980-81 resulted in lasting changes in the conditions of forming the river run-off and its thermal conditions. The influence of climate variations increased by the intensive anthropogenic activity. This problem is explored in the paper for one “hot ecological point” of Bulgaria. The area under investigation is an open coal field and the nearby thermal electrical stations in the region of “Maritsa-Iztok”.


Abstract: Some new hydrological information concerning the Rila Mountain water resources has been presented. It is collected at the hydrometric gauge stations in the region and special field measurements to study space-temporal distribution of hydrological parameters. A periodicity in the hydrological regime has been revealed and after 1978-80 - a sharp decrease in the run-off because of the drought. The influence of climatic changes and the anthropogenic impact on the hydrologic processes and the water resources of Rila have been studied.


Abstract: Proceedings of the Bulgarian-American workshop ‘Bulgaria and global change’ at the American University of Blagoevgrad, 1977. The proceedings contain 9 papers:

- Bulgaria and greengas discharge - K.Simeonova, H.Hristov, H.Vasilev, S. Todorova
- Climate fluctuation and change - Vl. Sharov, E. Koleva, V. Alexandrov
- Hydrological fluctuation and global change - G. Gergov, L. Ziapkov, K. Lazarov
- Forest coverage, bioproductivity and climate change - Iv.Raev, O.Grozev
- Agriculture and climate change - V. Alexandrov
- Water resources and risks - S. Gerasimov, N. Nikolova, D. Davidov
- Demographic and social change - G. Geshev, N. Ilieva, N. Genov
- Data and information sources - D. Mishev, St. Tsonev, B. Kohen
- Political and institutional structure - Kr. Stantchev, D. Lolova


Abstract: During the last decades the city of Bourgas developed into industrial, transport and agricultural centre with all corresponding consequences, which negatively influence the waters of the Black Sea Bourgas Bay. In the early 1990s the standing stock of bacteria, zooplankton and benthos decreased significantly in comparison to the 1980s. Eutrophication led to mass development of phytoplankton and permanent algal blooms, which were the reason for frequent hypoxic situations and mass mortality of benthos, including fish.


Abstract: It is well known that erosion modifies soil properties causing soil structure deterioration that affects mostly soil aggregation and water retention. This study aims to investigate how Sulphomethylated Polyacrylonitrilic Hydrolisate affects soil aggregation and water retention of eroded Chromic Luvisol. Sulphomethylated Polyacrylonitrilic Hydrolisate (called SMVZP) was syntheised by the University “Prof. Dr. Assen Zlatarov” from waste Polyacrylonitrilic fibres. A field experiment was set up on cultivated field (potatoes) in the Experimental Field of N. Poushkarov Research Institute for Soil Science and Agroecology near Mirkovo village to study how SMVZP affected soil aggregation and water retention of sandy loam Chromic Luvisol, moderately eroded, in the period July-September 1997. The results from this study showed that Sulphomethylated Polyacrylonitrilic Hydrolisate improves the structure of moderately eroded sandy loam Chromic Luvisol and can increase the crop yields.

Abstract: This article offers part of the scientific results of the investigations on the development of the karst in North Vietnam made by the authors who participated in the expedition “Vietnam ‘89”. The most characteristic regions with tropic karst have been investigated - the Ha Nam Nim and Lang Shon. The article reveals the present-day condition of the complex of karst forms, reflecting the development of relief in North Vietnam.


Abstract: The aim of the presented article is to expose peculiarities in geocological conditions of the landscape in the most specific part of Bulgarian Srednogorie and analyse their spatial differentiation on the basis of mapping, classification and regionalisation of the natural complexes in the investigated area. The regional and
the typological landscape-ecological units can be used as a basis for forest- and tourist ecological investigations in Central Sredna gora.

**Mladenova, B., 1983.** Simulation of crop irrigation regime under conditions of limited water supplies. Thesis.


**Mladenova, B., 1995.** Irrigation of Fibrous Flax when Water Resources are Limited- Proceedings of the EWRA 95 Symposium, Nicosia.


**Mladenova, B., V. Slavov, 1994.** Information/advisory system for optimum irrigation scheduling with limited water supply. Institute 40th anniversary proceeding of the research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE), Sofia, vol. XXIV.

**Mladenova, B., V. Slavov, 1999.** Prediction of the crop yields at optimum and at insufficient water supply. Agricultural engineering, 3-4.


**Neikova, J., Vl. Subkova, 1991.** Drip Irrigation with water from Danube river, Progress in the Agriculture, vol 5-6, p. 7-9, Bg.


**Neikova, J., 1997.** Evaluation of Heavy and Toxic Element's Content in the Plant production from Experimental Field Chelopechene, Conf."World Water Day.,


Abstract: It is widely demonstrated that the intensive cultivation of some agricultural soils can lead to deterioration in soil structure and other physical properties of the soil, and consequently to decreased crop yields and environmental degradation. The paper discusses the data for micro and macro porosity, pore shape and size distribution, aggregate stability, saturated hydraulic conductivity and water content analysed in a loam soil representative of the hilly environment of Central Italy, where a long term field experiment was carried out to study different types of soil tillage for maize cultivation. The results of this study showed that conventional ploughing induced the more relevant modification of soil physical properties resulting in damage to the soil structure. The main negative aspects associated with these management systems are the subsoil compaction (ploughpan) at the lower cultivation limit and reduced crop yields.


Abstract: Intensive cultivation of some agricultural soils can lead to deterioration in soil physical properties. To evaluate the suitability of a loam soil, representative of the hilly environment of Central Italy, to alternative tillage systems, an experiment was carried out where different types of soil tillage for maize cultivation were investigated. Micro and macro porosity, pore shape and size distribution, bulk density, aggregate stability, saturated hydraulic conductivity and water content were analysed. In the surface layer (0-10 cm) the macroporosity did not show much difference between the studied tillage systems, while in the subsurface layers the differences were more pronounced. In the soil tilled by ripper subsoiling the macroporosity was generally higher and homogeneously distributed through the profile while the other tillage systems showed a significant reduction of porosity at the lower cultivation depth. The resulting soil structure in the soil under ripper subsoiling was more open and more homogeneous. Aggregates were less stable in deep and shallow ploughed soils and this resulted in a more pronounced tendency to form surface crust compared with soils under minimum tillage and ripper subsoiling.


Abstract: This work deals with the regime and territorial distribution of precipitations on the northern slopes of Central Stara Planina. With respect to the regime it has been established that the precipitation minimum in the last 30 years has changed occurrence from February to October.
**Penkov, I., G. Ratchev, 1987.** Synoptical conditions and their influence on the formation of high waves along the rivers Varbitza and Yantra.

*Abstract:* This work elucidates the formation and specific features of waves in two different river basins with similar morphohydrographic characteristics but belonging to different climatic zones of the country, which are closely dependent on the respective synoptic situations.

**Petkov, Pl., 1996.** Laboratory and field research on synthetic drain envelopes. Proceedings of the Workshop on the Evaluation of the Performance of Subsurface Drainage Systems - 16th ICID Congress "Sustainability of Irrigated Agriculture", Cairo, Egypt, pp. 245-265.


**Petkov, Pl., V. Florov, 1998.** “The experience of Bulgaria in the use drip-irrigation” First International Conference on Rationalisation of Energy in Agriculture. Mansoura, Egypt

**Petrov, P., 1982.** Landscape structure of the region of the Danube plane. Annuaire de L’ Universite De Sofia,Faculte de Geologie et Geographie,75,, №2 - Geographie

*Abstract:* In the scheme of landscape regions of Bulgaria the Danube plain is determined as a foot-hill zonal region including 33 landscape districts. Their landscape structure includes different numbers of landscape group and a larger number of their outlines. Three indexes of cartometric data - index of landscape fragmentariness, index of landscape heterogenity and index of landscape order - have been calculated using the method of mathematical statistics. The landscape
structure of the different districts and the region as a whole can be disclosed by means of these indexes in the scheme of landscape.


**Abstract:** The terms “landscape ecology” and “geoecology” were introduced to the science by Carl Troll. The integration of the geosystematic and ecosystematic approaches is of great importance for the formation of the derivative conception of landscape ecology. Landscape ecology examines the regularities of the origin, evolution, ethology and special differentiation of the naturo-antropogeneous complexes as inseparable units. There are interpreted the conceptions of foreign and Bulgarian scholars.


**Abstract:** The article focuses on the ecological approach to the problem of recreational land use. On the basis of both the differentiation of the main types of landscape of the basin of Saparevo and the requirements of the recreational activities regarding the qualities, including ecological ones, of the natural resources, a landscape-ecological map was drawn. It shows the contemporary status of the basin of Saparevo.

**Petrova, R., et all, 1996.** Management information system in irrigation, 16th ICID Congress on Irrigation and Drainage, Transactions, Special session/Symposium, volume 1-E, p.71-78, Cairo.


**Petrova, R., S. Popov, 1996.** Study on the technico-operational parameters of irrigation equipment in the new condition in Bulgaria, 16th ICID Congress on Irrigation and Drainage, Poster Session, Summaries of poster papers, volume 1-D, p.7-8, Cairo.

**Petrova, R., et all, 1999.** The Bulgarian experience in the irrigated agriculture extension services, 17th ICID Congress: Water for Agriculture in the Next Millennium, Proceedings, p. 109-114 Granada Spain


**Abstract:** The author tries to determine the wind-power resources in the region of Varna. To assess them correctly he has used a few methods based on identical initial
information. He analyses the errors made in the course of wind-power evaluation by comparing the daily, average monthly and annual data of wind velocity with those obtained by anemorhumbographs.

**Ratchev., G., 1995.** Distribution of heavy snowfalls in South-West Bulgaria and typification of synoptical situations as a contributing factor.

**Abstract:** A criterion is suggested for heavy snowfall. In addition to its setting up on the basis of the two most efficient and important approaches in synoptical climatology, a typification is proposed for the synoptical situation, which produced heavy snowfall in South-West Bulgaria over a period of 28 years.


**Abstract:** The author makes a detailed assessment and determination of the natural and technical wind-power resources in Bulgaria.


**Abstract:** The paper discusses the results of an analysis of publishing activities among scientists from different countries covering the Black Sea environmental problems. Using the methods of formal scientometric analysis, they have been presented the most important publications in the field; the countries, organisations, scientists and informal research teams, working most actively in that problem area; the journals publishing the largest number of papers on the problems considered; the structure of international scientific communication, etc.

**Rousev, M., 1993.** Geo-ecological categorisation of countries of Europe /in Russian/. Izvestia RGO, t. 125

**Abstract:** Geo-ecological categorisation of countries of Europe is designed on the base of account of three groups of factors: Natural-history heritage; Social-ecological features and Ecological problems. Categorisation is designed by means of the multivariate statistical analysis. Four geo-ecological groups of countries are chosen.


**Abstract:** Against the background of the general socio-economic crisis in the region of Eastern Europe, it is tremendously important to analyse the causes of the ecological crisis in the region and to trace out the ways that will help to overcome it. To achieve this goal a large number of different tasks have to be fulfilled such as economic restructuring, stabilisation of the legislative system, provision of research grants, etc. The successful transition to sustainable ecologo-economic development depends on the specific combinations of the existing natural and socio-economic factors with the scientific-technological progress. At present, serious problems are arising from the incompatibility of the principles, goals and tasks of sustainable development and the socio-economic and political conditions in this region.

Abstract: The aggravation of the ecological situation as a result of operating thermal power stations brought about a search for alternative energy providing variants for the economies of the countries from that region, and it is a most essential prerequisite for the development of nuclear energetics. When studying the degree of ecologisation of all phases of the nuclear cycle, new concepts are developed of the character and role of the ecological factor against the background of traditional factors determining the territorial organisation of electric power generation. The main way to reduce energy pressure on nature is to increase the share of renewable energy. The resolution of such a dilemma is possible to achieve by increasing the effectiveness of energy use in a short-term period, as well as through the use of renewable energies in the long run.


Abstract: Metallurgy in the East European region was established under the conditions of sharp opposition between East and West, when the urge to overtake the highly developed countries at any price provoked a casual attitude to the territorial organisation of this branch. Metallurgy is one of the ecologically most aggressive branches of economy. Ecological problems in this branch go deeper owing to the processes of superconcentration of production. The transition to a sustainable ecological-economical development in the region requires a significant reduction of the metal costs of national income. This requires a radical reorientation of this branch and the heavy industry as a whole. But at this stage it is limited by the shortage of financial means.

Rousev, M., 1996. Sustainable development, demilitarisation, global and regional security /in English/. Bulgarian military review, Vol 4, 3-4

Abstract: The solution of global problems calls for united efforts of all countries. In this context, militarisation, which is in disharmony with the growing non-military aspects in assuring global and regional security in state-to-state relations, has a particularly adverse effect on the development of contemporary civilisation. By force of historically established tradition, the national and regional security is, above all, military-political in character. At the end of the 20th century, however, global sustainable development requires a limiting of militarisation.


Abstract: The effect of ecological problems upon international relations is clarified as well as the role of the countries in Europe in solving it. A typological geo-ecological classification is made and 4 geo-ecologocal types of countries in the continent are defined. The ecological interdependence between them is determined only by the unity of environment in regional and planetary scale. It concerns such questions as territorial ecological consumption, ecological national security and co-operation, ecological contradictions and conflicts, etc.


Abstract: Chemical industry brings about enormous spare labour. However, it is distinguished by its ecological capacity level – a high relative consumption of natural resources and excessive pollution of the environment by toxic compounds. Modern
ecological limits in development of the branch in countries of Eastern Europe requires a new strategy, based on principles, purposes, problems and instruments of sustainable development on global and regional scales.

Abstract: Interdependence of global problems at the end of the twentieth century is more and more obviously leading to a new paradigm in the views of humankind. The characteristic of the specific features of India’s geoecological position nowadays is of great importance in defining India’s position in creating and solving the global problems. The problems of relations between nature and society in India may turn to be the crucial factor for its image in regional and global dimensions. On the other hand, the position of the country in international relations is important in solving a variety of internal problems that are geoecological and are difficult to solve without the help of the international community.

Abstract: The global problems are of various nature, but they are provoked by the horologic unity and the rapid destruction of the balance between humankind and nature. The main failure of the existing classifications is that they do not reveal the existing differences between the forms of anthropogenic pressure, the resultant global problems and the possibilities and forms of conducting a geo-ecological policy. The scientific geographic approach makes it necessary that the defining of the global problems be primarily based on the ratio between inhabitable geospace and anthropogenic activity.

Abstract: For a period of 30 years (1960-1990), the area of the arable land in Bulgaria was decreasing gradually with an average annual rate of about 8,000 ha per year from 4.8809 to 4.6427 million ha. The aim of this paper is to present values of the soil erosion factors (topography, climate, soil and land use) and the soil loss rates over the territory of Bulgaria as estimated by the Universal Soil Loss Equation (USLE). Soil conservation problems by water erosion in agricultural land are discussed as well. Natural conditions (climate, topography and soil, and plant cover) give rise to serious soil degradation by water erosion over 64 % of the territory of Bulgaria. About 80 % of the agricultural land is potentially exposed to the risk of water erosion. The actual soil loss rate depends mainly on land management – cropping pattern and crop rotations, tillage, introduction of erosion prevention measures in the erosion-sensitive areas, etc. It is hard to predict the future rate of soil degradation by erosion while radical changes of the county’s economy take place. The rate, direction and technologies of crop production are economically driven. In contrast, soil and water conservation (the maintenance of soil fertility and the quality of surface and subsurface water resources) and the protection of the environment as a whole are not economically-dependent but imperative tasks that must be jointly guaranteed by the state, the land-owner and the land-user.

Abstract: The model approach developed in this study has proved to be a useful tool to predict how power-plant coal-ash affects the physical properties of soil materials (soils and parent materials) when it is mixed with them. Decrement of clay and physical clay contents, particle density, water retention, and porosity and the
increment of bulk density of ash-mixed soils can be predicted easily from the respective physical properties of the clean soil and the ash, and the percentage of ash added using the formulated predictive functions. Affects of power-plant coal-ash on the physical properties of ash-mixed soils or parent materials can be predicted by linear-type functions (for clay and physical clay contents, particle density and water retention) and by exponential-decay-type functions (for bulk density and porosity). The approach developed in this investigation is sufficiently general and the soil materials used have sufficiently contrasted physical characteristics. Thus, additional studies are needed only to validate the suitability of the predictive equations for broader value ranges of the power-plant coal-ash characteristics.


Abstract: A field experiment was carried out on alluvial soil, continuously cropped with maize for 8 consecutive years between 1987 and 1994, to study the long-term affects of continuous annual sewage sludge application (20, 40 and 60 t/ha) on the soil physical properties. It was found that the studied soil physical characteristics of the top 30-cm layer are changed due to the sewage sludge treatments. Relative contents of particles finer than 0.001 and 0.01 mm and particle density decrease in direct proportion to the rate of sewage sludge applied. These affects are due to the physical characteristics of the sewage sludge applied. Soil samples from sewage sludge treated variants show better soil structure, decrease of bulk density and increase of porosity. Lower sewage sludge application rates result in higher effects on bulk density and porosity while the coefficients of structural stability increase from 13 to 80 % in direct proportion to the sludge application rate. Established effects of sewage sludge treatments on the soil physical characteristics are better expressed for the variants with combined application of sewage sludge and mineral fertilisation. Sewage sludge applied previously still affects the soil physical properties of the treated variants three years after the termination of the field experiment, though the differences between treated and the untreated variants are smaller as compared to the sampling after seven years of continuous annual sewage sludge treatment.


Abstract: This paper aims to present the results of comparative tests on the suitability of different models for predicting the soil loss by sheet water erosion on Chromic Luvisols from three geographical regions. The models tested are: the Universal Soil Loss Equation (USLE), its modification according to the Methodology for developing the National Long-term Erosion Control Programme (NDPBE) and 11 equations, proposed by Daskalov. It is found that average annual soil loss predicted by the equations of Daskalov and the USLE do not differ statistically from the soil losses measured in 1998, while predictions by the Methodology for NDPBE are significantly higher than the measured values. Information from long-term field soil erosion observations is needed to draw explicit conclusions on the adequacy of the tested models to predict average annual soil loss. The equation, proposed by Daskalov, for predicting the soil loss from single rainfall is not capable of giving adequate predictions because it is based on regression analysis of limited data source, but not on the physical relationships describing the processes, as modern models do.

Rousseva, S., 1999. Properties of Bulgarian Chromic Luvisol as affected by landscape position and erosion. Proc. 6th International Meeting of Soil with Mediterranean Type of Climate, July 4-9, 1999, Barcelona, Spain, 1048-1051.
Abstract: Knowledge about soil properties along a hillslope is essential for predicting the changes in soil erodibility, rates of water erosion and soil productivity. This study aims to investigate the influence of landscape position and erosion on the soil properties that define the relative productivity of Bulgarian Chromic Luvisol. Soil profiles were set up and sampled in 1988 and 1998 at representative points along a slope with total length of 101 m and varying slope gradients. The data for the soil properties in 1998 were compared with those found by previous study on the same site in 1958. Average annual soil loss for the period 1958-1998 was estimated using USLE, considering the land use and management. Analysis of correlation showed that average annual soil loss estimates explained 94.5 % of the variance of relative increase of coarse sand content, 91.8 % of the variance of change of mean-weight diameter of structural aggregates, 86.3 % of the variance of relative decrease of pH and 74.9 % the variance of relative decrease of organic matter content. The results of this study showed that: (1) Soil properties depended significantly on landscape position and erosion rates and (2) Soil erosion rates should not be underestimated when modelling the changes in soil properties associated with landscape position.

Rousseva, S., M. Pagliai, 1999. Fractal characteristics of soil macroporosity as influenced by tillage and traffic, In: R.Horn, J.J.H. van den Akker & J. Arvidsson eds. "Subsoil Compaction, Processes, Consequences and Distribution". Abstract: In the framework of research on evaluating the suitability of a loam soil (Eutric Fluvisol) from the Tuscanny region of Italy, two alternative tillage systems for maize cultivation are investigated as to whether fractals have a potential to distinguish between soil pore systems influenced by different tillage systems, traffic and possible subsoil compaction. Macropore size and shape distributions are measured by image analysis on thin sections prepared from soil samples collected from four tillage treatments: deep ploughing, shallow ploughing, minimum tillage and ripper subsoiling. It is found that pore surface roughness and pore volume fractal dimensions can be useful in modelling the soil pore systems affected by different tillage treatments. Possible subsoil compaction in the layers 40-50 cm of deep ploughing, 20-30 cm of shallow ploughing, and 10-20 cm of minimum tillage and compaction below wheel tracks at the soil surface result in increase of both fractal dimensions, i.e. soil compaction yields rougher pore walls and more homogeneous pore systems.

Rousseva, S., T. Mitova, K. Stoinev, I. Dimitrov, 1999. Studies on subsoil compaction caused by tillage and traffic in Bulgaria: a review, In: R.Horn, J.J.H. van den Akker & J. Arvidsson eds. "Subsoil Compaction, Processes, Consequences and Distribution". Abstract: A review of publications on the subject has shown that two types of subsoil compaction have been recognised in Bulgaria: (i) developing a “plough pan” caused by continuous tillage to a constant depth and (ii) genetically conditioned subsoil compaction by clayey compacted subsoil (Bt) horizons. Studies on both types of subsoil compaction are rare and associated mostly with research on technical measures to prevent seasonal superficial waterlogging. It is recognised that intensification in agriculture and the increase of both the mass of agricultural machinery and the number of wheeling events during the last 3-4 decades has resulted in soil structure deterioration and compaction both in the topsoil and the subsoil. A review of the studies on soil compaction caused by tillage and traffic has shown that the main research topics were associated with studies on the changes in the crop growth and the physical properties following passage of metal- and rubber-wheeled tractors and applying different tillage systems.
Sarafska, N., 1995. Variation in the annual and monthly runoff of the river Voucha under the influence of the anthropogenic activities. ANNUALE DE L’ UNIVERSITE DE SOFIA “ST. KLIMENT OHRIDSKI”, Livre 2-GEOGRAPHIE, Tome 86.
Abstract: In the present work the variation in the annual and monthly runoff of the river Voucha has been viewed. As a result of the investigation carried out, considerable variations in the annual runoff and in the configuration of the stream flow hydrograph have been established. The author has drawn the conclusion that the possibilities for usage of the river waters in the examined sector of the watershed are limited.

Abstract: The paper examines flow variation under the influence of significant anthropogenic activities. The moment of transition from natural balance to natural-anthropogenic balance, the period of system relaxation and regularities in the flow behavior after some hydrotechnical activities were carried out within the river system have been determined.

Abstract: This paper provides an overview of the objectives, methodology and steps performed so far in the preparation of the Bulgarian Climate Change Action Plan (BCCAP).
The potential areas and sectors of economy to be addressed in the mitigation section of the BCCAP are presented based on results of Bulgaria Country Study to Address Climate Change. These include improving efficiency of energy demand in the following sectors of the national economy: industry, transport, households and services as well as new technologies in energy supply, upgrading of district heating plants, reducing heat and electricity losses and increasing the use of renewable energy.
Several projects are identified in the above-mentioned areas, and preliminary estimates of their effect and necessary investment are performed. The paper focuses on the investment opportunities in Bulgaria and gives information on increasing attention towards foreign investment in the country.

Abstract: The paper provides an overview of the activities and projects implemented in Bulgaria in the field of the greenhouse gas emissions inventory and mitigation. The results received indicate that carbon dioxide is the main greenhouse gas in Bulgaria and fuel combustion is the most important emission source. This defines energy-related activities as the main target of greenhouse gas mitigation and energy efficiency as an area where cost-effective measures could be implemented in a very short term.
Different mitigation scenarios are elaborated that clearly indicate that due to the economic recession Bulgaria will not exceed the base year emission levels in the near term. The long-term stabilisation of the greenhouse emission level could be achieved only by implementing a comprehensive and well co-ordinated national policy.

Abstract: Future developments of the Bulgarian economy, energy demand, energy supply and greenhouse gases (GHG) emissions are projected and evaluated for base-line, mitigation and energy policy scenarios. Different methods and approaches are used at different stages of the study and key mitigation options are identified and evaluated.

The results obtained indicate that the aim of the Framework Convention of Climate Change (FCCC) to have GHG emissions by the year 2000 below the base year 1988 emissions will be achieved without further mitigation steps. The key mitigation options are assessed that will allow a reduction in GHG emissions and enhance sinks. Their implementation has to start now in order to prevent a GHG emission increase in the decades from 2000 to 2020.


Abstract: This problem has been a subject of research works of the Bulgarian geographers since 1906. This study is the 5th publication in Bulgaria that is devoted to this problem. A short summary is done in it of similar publications in some other countries. Some peculiarities and regularities are shown in the altimetric distribution of the population and the settlements in global, regional and national dimension. Considerable space in the report on research is devoted to the factor analysis of settlement distribution. The criteria of perceiving the sweep of the altimetric zones are shown. In this context, the basic characteristics of the physical-geographical components are shown as well as their reflection on the demographic and settlement development of the different altimetric zones. The influence of the political factors on the researched process is analysed in detail. The territorial change of the country is followed from the end of the fourteenth Century till now and its reflection in the demographic and settlement development of Bulgaria including the vertical aspect is demonstrated.

The accent of the work has been put on the analysing the tendencies and the present condition of altimetric distribution of the settlements in different types. For this purpose a great deal of indicators – population and settlements density, a reality of the settlements and their inhabitants, the index of stability of the settlements, the index of variety of average number of inhabitants in settlements etc. -are used.

In conclusion, the greater concentration of the population in altimetric zone from 500 to 700 metres is prognostical, because of the worsened demographic and socio-economic situation in the rest of the altimetric zones.


Abstract: The political changes in Bulgaria after 1989 created a seesaw pattern of democratic and socialist domination of government, making the development of a coherent long-term development strategy problematic. Within the economic system of the former communist countries, Bulgaria was assigned both an agricultural and heavy industrial production role. It has to be pointed out that Bulgaria has very limited natural resources and its climate variability is marked by severe drought periods which have caused pressure on industry, agriculture, urban population and water supply systems. During the period of transition there are fortuitous reductions of environmental impacts due to the economic stagnation the country is experiencing. At the same time a new culture of private businesses, crime and consumerism is
emerging which is reshaping the values, needs and goals of society. New governmental, private and non-governmental structures are evolving in the medium of democracy while the linkages among them are not yet developed. The current situation of Bulgaria, as a CEE country, with its uniqueness and similarities in development and vulnerability, has important research needs in the fields of energy, water resources, agriculture, waste and pollution, and policy-making. These areas evoke research topics that might become part of International Human Dimensions Programme. The goal of this case study of Bulgaria is to highlight research projects and activities that broadly relate to initiatives and topics of IHDP. Section 1 gives an overview of past and current research activity, part of which is illustrated by the work related to the National Co-ordination Centre for global Change and other components embedded in the description of projects fulfilled or in progress. Section 2 highlights future goals and the research agenda of the Bulgarian scientific community and major collaborating partners and sponsors. Section 3 inventories institutions and organisations participating in research and policy making.


Abstract: Large empirical data have been used for the assessment of the anthropogenic impact over the region. The main periods in the anthropogenic impact have been shown.


Abstract: The changes of the winter and spring run-off in South Bulgaria. The climate peculiarities have been taken into account.


Abstract: The fluctuations of the spring discharge have been studied by means of the correlation analyses. This has revealed the tendencies in its changes and its relation to the total annual water volume.


Tenev, B., N. Tznakov, N., Teneva, 1999 Problems of water pollution from Agriculture. The fourth scientific and practical international conference of BNWQA, Sofia


Abstract: Climate change due to the anthropogenic GHG emissions is one of the major contemporary environmental issues. The mechanism of appearance of this issue and a brief history of its impacts in the last decades are presented. There is a list of fields impacted by the climate change such as temperature rise and sea level rise, changes in water circulation pattern and water resources, impact on the frequency, intensity and location of the climate extremes, influence on the forest ecosystems, agriculture, human health, and other market and non-market consequences.


Abstract: Agro-technical measures for erosion control of arable land provide high soil prevention efficiency and low cost. Three degrees of straw utilisation at deep plough were studied: 1) removing it from the field; 2) burning it and 3) digging the entire straw amount into soil during fall plough. These practices were tested for growing maize included in four different crop rotations, among them intermediate crops. The results showed that digging the entire straw amount into soil during fall plough decreased the maize yield with about 10 %. Intermediate crops increased the yield of feed units and digestible protein and provided better soil protection.


Abstract: During the 1989-1992 period the following soil conservation practices for maize cultivation were studied on a slightly eroded calcareous Chernozem, at 6-7o
slope: 1) sowing with a pneumatic seeder; 2) sowing with a pneumatic seeder equipped with a device for making 15-20 cm deep furrows and 3) sowing with a pneumatic seeder equipped for making 15-20 cm deep slits. The furrows and the slits were made in the tractor wheel-tracks alone. The sowing practices were examined against the background of three basic soil tillage operations: 1) mould-board plough; 2) cultivation with KR-1.75, equipped with a device for soil furrowing and 3) no tillage. The results showed that cultivation with KR-1.75 combined with furrowing reduced soil loss as much as 1.5 times and increased crop yield by about 5 %, as compared to the conventional mould-board plough. It is concluded that furrows and slits in the tractor wheel-tracks during seeding are a promising way for soil conservation in maize cultivation.


Abstract: Chromic Luvisols cover 8.7 % of the territory and about 18 % of Bulgaria’s arable land. Over 50 % of this area is located on hillslopes and therefore affected by water erosion. This paper aims to present new information about soil and nutrient losses from different crops grown on Chromic Luvisols and predicted average annual soil losses using the Universal Soil Loss Equation. Field runoff plots were set up in the experimental fields of N. Poushkarov Research Institute for Soil Science and Agroecology located near Suhodol (under fallow, wheat, maize and brassica) and near Mirkovo (under fallow, potatoes, peas-oats mixture and rye), Sofia region. The results from this study show that:

It is most likely that the USLE predictions overestimate the average annual soil losses from fallow and different crops grown on the studied Chromic Luvisols, although field soil loss observations for much longer periods are needed to correctly assess the applicability of the USLE for prediction purposes;

(2) Amounts of measured washed-out humus and nutrients from the studied Chromic Luvisols were low, but long-term and/or intensive erosion events might cause significant pollution of the ecosystems.


Abstract: This paper presents new information about soil and nutrient losses by sheet water erosion of Chromic Luvisols under fallow and different row and covering crops in three geographical regions of the country – Sofia plain, Sredna Gora Mountains and Sakaro-Derventski region. The losses of soil and nutrients were measured using field runoff plots that were set up in the soil erosion experimental fields of N. Poushkarov Institute of Soil Science and Agroecology, located near Mirkovo and Suhodol, Sofia region, and Topolovgrad. It was found that annual soil losses from erosion of the studied Chromic Luvisols varied within broad limits from 0.1 to 9.4 t/ha depending on the crop cover and the soil, landscape and climate conditions. Small amounts of humus, nitrogen, phosphorus and potassium were found to be washed out with the eroded soil but it was concluded that continuous and/or intensive erosion processes on the Chromic Luvisols could cause environmental pollution and create ecological problems. Humus and mineral nitrogen were found to be the most vulnerable to erosion leaching, followed by potassium and phosphorus.

**Abstract:** The present research explains the structure of the chronological fluctuation of the average month temperatures around January, April, July and October and of the average year temperature of the air. For that purpose the methods of moving average and auto-correlation function are used. Research was based on observation from 21 meteorological station in Bulgaria. The cycles with different duration are established. The middle frequency and low frequency cycles are statistically significant. The amplitude of fluctuation in the winter is bigger than that in the summer.


**Abstract:** The structure of the long-term variation of average monthly and average annual air temperatures in the stations of Obraztzov Chiflik, Gabrovo and Sadovo is analysed in this paper. The graph of the 3- and 5-year-running means indicates that the most marked synchrony refers to January and October as well as to the annual air temperatures. The amplitudes of the fluctuations are bigger in winter than in summer. Autocorrelation functions are calculated so as to evaluate the authenticity of the cycles. The analysis shows a rather vague cyclic recurrence or absence of statistically significant cycles. The tendencies in the air temperature variations are researched by linear trend. There is a slight change of the average annual air temperatures. The most substantial changes are recorded in Gabrovo, where the trend is positive all the year round.


**Abstract:** The aim of this research is the trend of the temperature change to be detected and its spatial representation. The linear trend method is used for defining the sign of the trend of the temperature change. Against the background of the global increase of the temperature fixed by the different authors, the results of the research show increase of the mean temperature in January in Bulgaria from 0.1 to 0.5 °C/10 years and decrease of the mean temperature in July from 0.2 to 0.5 °C/10 years. Significant changes in the mean annual temperature are not detected. The results of the research are spatially modelled and the temperature changes in different regions of the country are represented. A technology that unifies the priorities of the system for analysis of the statistical surfaces SURFER and Geographical Information System ArcCAD is used in the mapping.


**Abstract:** In this summary new data on hydrochemical parameters, phytoplankton, zooplankton and fish resources in the Bulgarian Black Sea for the period 1991-95 have been included. The dynamics of all above-mentioned ecosystem components and the standing stock and reproduction of fish populations are discussed in relation to major ecological problems - eutrophication and overfishing.

Abstract: The problem of correct and consistent estimation of GHG emissions continues to be of great importance. This matter is most strongly connected with the methodological problems with the implementation of the commonly used international methodology developed by the IPCC and shown in the Revised 1996 IPCC Guidelines. The object of research is the economy of a given country. Some examples are on Bulgaria’s practice for the period 1990-1995. The following conclusions were drawn: The theory of linear vector spaces can be successfully implemented for the mathematical modelling of the methods for calculation of greenhouse gases. The comparison of the methods of the type top-down and bottom-up should be done by clear formulation of the conditions and the level of precision with which the sources of emissions are modelled. The comparative quantitative estimations between the two methods implemented in the forecast of CO₂ emissions can serve as a criterion for the functioning of the models of parts of the energy systems as well as for the entire system on the practice of Bulgaria for the period 1990-1995.


Abstract: Some climatic characteristics of the near regions around the location of the “Kozlodui” Nuclear Power Station and the projected Nuclear Power Station close to Belene are presented. Attention is paid to the main meteorological processes and the local changes connected with these processes of the meteorological parameters that can significantly influence the dissemination of radioactive materials in the atmosphere. Some problems of nuclear meteorology are discussed.


Abstract: The classification of winter seasons according to W. Hesse (1953) has been used for determination of vertical changes in the winters’ nature. Ten Hesse winter types are studied, and the author suggests two new types of precipitation.


Abstract: Taking as examples the towns of Varna and Bourgas, some temperature fluctuations have been analysed on the basis of the average monthly and annual temperatures, the mean min and max temperatures and the annual temperature amplitudes.


Abstract: 15 characteristics of the snow cover have been calculated, based on data from 70-80 stations for a 30-year period. The vertical gradients of the basic characteristics have been defined, and maps of the average dates of the first and the last snow cover have been composed. The conditions of regime-forming and geographic distribution of snow cover are elucidated.

Abstract: The winters in Sofia (1) from 1899/1900 till 1979/1980 and in Sofia (2) from 1954/1955 till 1979/1980 are investigated. The author shows fluctuations in winter types according to W. Hesse for an 80-year period.

Abstract: On the base of data for 50 stations in a 30-year period fogs in Rilo – Rhodope massiv are investigated. A comparison is drawn with periods of 20 and 40 years. Results are connected with the development of tourism and holiday activity.

Abstract: In the base of the information obtained for a period of 30 years the peculiarities in the regime and territorial distribution of climatic elements in Stranja-Sakar are determined. The result of the investigation justifies the division of the territory into two climatic regions – inner and coastal, with the former being divided into 3 subregions.

Abstract: A textbook for the students of geography. The chapter “Climatic changes” examines the climatic changes in the geological and historical past, the present changes and the causes of climatic changes.

Abstract: This article is an attempt to make a comparative typification of winters in according to selected quantitative indices of snow cover, air temperatures and quantity of snowfalls (number of days with snow cover, sums of negative temperatures and quantity of snow falls) for the period from December to February.

Abstract: This work dealing with years of climatological data is an attempt to generalise the resemblances and differences in the forming and in the regime of the snow cover at different altitudes. The author takes into consideration the influence of thermal and precipitation regimes on the snow cover.

Abstract: The chronological variations of the sums of negative daily mean temperatures for the cold period of the year (November-March) are explained. The methods of filtration, autocorrelation and curves of integral differences are used. The trend for the 87-year period 1899/1900 - and for parts of this period - is calculated.

Abstract: This investigation throws light upon the chronological fluctuations of the thermal continentality of climate characterised by the annual amplitudes of the air temperature. The methods of filtration (5- and 11-year moving average values) and autocorrelation are used.
Vekilska, B., G. Rachev. Current changes in the precipitations in Bulgaria. Ann. of the University of Sofia, Faculty of geol. and Geog., V. 90(2), at the printer’s.

Abstract: In connection with the water crisis in Bulgaria, especially in the capital Sofia, in the first half of the nineties, changes in precipitations for the period 1981-1994 are compared to normal values.

Velev, S., 1996. Is Bulgaria becoming warmer and drier? GeoJournal 40.4

Abstract: On the basis of the average monthly and annual precipitation data from 18 stations for the 1916-1955, 1931-1970 and 1954-1993 periods, the tendencies in precipitation changes are outlined and the degree of warming and drying where such phenomena have been recorded is defined.


Abstract: In this summary new data on hydrochemical parameters, phytoplankton, zooplankton and fish resources in the Bulgarian Black Sea for the period 1991-95 has been included. The dynamics of all above-mentioned ecosystem components, the standing stock and reproduction of fish populations are discussed in relation to major ecological problems - eutrophication and overfishing.

Vurbanov, M. 1992. The formation and change of the run off and the chemical composition of the rivers in North-west Bulgaria, dissertation for conferment of the degree of Ph. D in Geography, Moscow.

Abstract: This dissertation studies the spatial and temporal characteristics of the flow and the chemical composition of the rivers in the region under the circumstances provided by a temporary anthropogenesis of the geographical environment. For the analysis of the long-lasting dynamics of the quantitative and qualitative characteristics of the rivers a vast range of statistical methods and graphic drawings are used. With the analysed data the natural and anthropogenetic periods of the change of the rivers are determined, and a quantitative evaluation of the transformations is given. A basic scheme of the hydrological-hydrochemical investigation of the river basins and some separate regions is constructed under the conditions of intensive and varied economic activities.


Abstract: Balkan endemic nephropathy (BEN) is widely spread in certain regions of Bulgaria, Rumania, Croatia, Serbia, Bosnia and Hercegovina. BEN is a serious chronic interstitial nephritis with predisposition to epithelial cell tumors of the upper urinary tract. These tumors have not been investigated cytogenetically yet. Comparative genomic hybridisation (CGH) analysis was performed on a urinary tract tumor of a patient with BEN. Determination of intensity differences between the green and red fluorescence signals was performed using the ISIS software (MetaSystems, Germany). Gains at the chromosomal loci 2p16-pter and 7q32-qter were consistently
found. By using specific DNA probes for 2p and 7q it was determined that both regions were present in three copies. The analysis of other tumor samples will be undertaken to verify whether these chromosomal abnormalities are consistent in uroepithelial tumors of BEN patients.


Abstract: On the basis of information, provided by hydrochemical mapping which took place during 1957 - 1962, as well by using statistical and graphical methods, the provisional - natural (background and anomalous) hydrochemical situation has been established. On a map scaled 1: 25 000 the regions with background and anomalous concentrations of copper, lead, zink, molybdenum, pH,SO4, and the general mineralisation are delineated.


Abstract: The influence of the activity activity of “Asarel - Medet” complex on the migration and concentration of same chemical elements ( Cu,Pb, Zn, As, Cd ) in ground water and waste water is researched.


Abstract: The time and spatial changes of the pollution of the water of the Kamchia river is researched with the indices of the pollution of the indication of soluble O2, biological demand of O2, Mn oxygenate, soluble and non-soluble substances, NH4–N, NO3-N and total Fe. Data is used from 20 monitoring station in Bulgaria about the period 1990 – 1997.


Abstract: Many years observations of the chemical composition of the water rivers allows the statistical methods to be used for researching the variations of the chemical composition owing to human activity. In the regions with different geographical conditions the variations of the chemical composition start from the
beginning of the 70ths. This is statistically proven. The $\text{SO}_4^{2-}$, $\text{Cl}^-$ and $\text{Na}^+\text{K}^+$ ions are with considerably increased concentrations.


**Abstract:** An attempt to apply an algorithm for specifying quantity changes of chemical composition of rivers is made with the example of the Rodopes. The moment of change of the hydrochemical rate is determined and the degree of anthropogenic impact is estimated by using varying graphic and statistical methods.
Appendix 6

National Co-ordination Center For Global Change at BAS
Scientific Technical Union of Water Affairs in Bulgaria
Rakovska Str. 108, Hall No 3

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PROGRAME of the workshop
“Capacity Building for Bulgarian Human Dimension Programme”
02 - 03 June, Sofia
Sponsored by: International Human Dimension Programme on global Environmental Change (IHDP)
Co-Sponsors: National Co-ordination Center for global Change (NCCGC), Bulgarian Academy of Sciences; Scientific Technical Union of Water Affairs in Bulgaria

Friday, 02.06.2000,
Registration
Session 1, Chairman: Prof. Todor Hristov

0900-0915 Opening - D. Mishev, president of NCCGC
Ramine Shaw - representative of IHDP Secretariat
0915-1000 Overview of the scientific studies area of HD/GEC - Prof. G. Knight
1030-1100 Current International Programmes. Funding possibilities for HD/GEC research - Ramine Shaw, IHDP Secretariat
1000-1030 Break
1100-1130 Overview Bulgarian research activities - HD/GEC - speaker T. Hristov
speaker from Greece - Prof. Dr. Michael Decleris
speaker from Romania - Prof. Dan Balteanu
1230-1400 Cocktail-lunch

Session 2, Chairman: Assoc. Prof. Marieta Staneva
1400-1430 National priorities in the HD/GEC research, National HDP, International co-operation opportunities - Daniela Zlatunova
1430-1530 Breakout groups: Discussing National HDP
1530-1600 Break
1600-1630 Feedback from Breakout groups
1630-1700 Drafting a National HDP - acad. Dimitar Mishev and commission
1700-1730 Creation of National HD Committee in the framework of the NCCGC-BAS
1900- Dinner: Foreign participants, Steering Committee of NCCGC and Bulgarian HD/GEC Committee

Saturday, 03.06.2000, (Programme for foreign participants)
0900-1500 Visit of National Rila Mountain Park (Rila Monastery)

Organisational Committee:
acad. Dimitar Mishev - President of NCCGC
Prof. Todor Hristov - secretary of NCCGC
Assoc. Prof. Marieta Staneva - Pensylvania State University
Assoc. Prof. Galia Bardarska - representative of GWP
Assoc. Prof. Vania Ioncheva - Institute of Water Problems
Margarita Siarova - secretary of Scientific Technical Union of Water Affairs in BG
### Appendix 7

**"Capacity Building for Bulgarian Human Dimension Programme"**

**Workshop participants**

<table>
<thead>
<tr>
<th>No</th>
<th>Family, Name, Second name</th>
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Appendix 8

Human Dimensions of global Change: The Challenge and the Promise

C. Gregory Knight
Professor of Geography and Director
Center for Integrated Regional Assessment
The Pennsylvania State University
USA

(Prepared for the Workshop, “Capacity Building for the Bulgarian Human Dimension Programme,” 2-3 June 2000, Sofia, Bulgaria)

Academician Mishev, Professor Hristov, Ms. Shaw, Professor Balteanu, Professor Decleris, honored guests, and colleagues in the global change research community:

I regret deeply that I am not able to be with you in person for this very important workshop on “Capacity Building for the Bulgarian Human Dimension Programme” sponsored by the National Co-ordination Center for global Change (NCCGC). This workshop continues a tradition that was first begun in the dark days of the economic crisis of December 1996 and January 1997, but the roots are deeper. Let me explain:

In 1995, when the Center for Integrated Regional Assessment at Penn State asked me to become its director, I suggested that Bulgaria be one of the focal areas for our research. It represented a country like many in political and economic transition; it is a country neither arid nor humid, but vitally dependent on mountain watersheds for lowland water resources; it is a country that is highly dependent on scarce water resources that would be affected by climate change; and, to be honest, it is a country in which I wanted to work for the foreseeable future! When CIRA received funding from the U.S. National Science Foundation (NSF) in 1996, we immediately launched a plan to begin global change research in Bulgaria. In late 1996, Prof. Hristov, already a colleague in water resources research, brought us together with Academician Mishev. With the advice of Hristov and Mishev we launched plans for the American-Bulgarian Workshop, *global Change and Bulgaria*, hosted at the American University in Bulgaria in June 1997. Papers were commissioned on global change topics; the papers were preprinted and circulated to the participants. At the workshop, Bulgarian colleagues quickly converged on an agenda for future global change research in Bulgaria, documented in *Глобалните Промени и България* published in 1999. The participants also elected Mishev and Hristov to leadership and organised a petition to BAN for formation of the NCCGC, which was accepted in July 1997. Since that time, CIRA has continued to assist NCCGC by inviting its co-sponsorship of the 1999 Budapest workshop on *Integrated Regional Assessment of Climate Change in Central and Eastern Europe*. CIRA has also funded an on-going study of the 1993-1994 drought in Bulgaria as an analogue for future climate change, co-ordinated by Professor Ivan Raev of the Forest Research Institute in Sofia. This project analyses the hydroclimatological, ecological and societal impacts of the drought that originated as long ago as the early 1980s and caused significant disruption in Bulgaria in the period 1993-1995. We have also co-sponsored an important survey of Bulgarian perceptions of the risks of global warming. A number of other projects are linked to the CIRA-NCCGC collaboration.

Today, I would like to briefly suggest some of the opportunities and challenges for future research on the human dimensions of global change in Bulgaria, leaving it to Ramine Shaw from IHDP to set the Bulgarian potentials into the wider realm of international programmes and initiatives. Here I will say a few words about what we
mean by “human dimensions.” Then I will try to suggest some imperatives for HDGC work in Bulgaria, concluding with some important issues about how we undertake this endeavor.

**Human Dimensions of global Change**

One brief definition of HDGC research comes from NSF:

*HDGC research focuses on the interactions between human and natural systems, with an emphasis on the social and behavioral processes that shape and influence those interactions (NSF 1995)*.

The International Human Dimensions Programme speaks of HDGC as:

*THE HUMAN DIMENSIONS of global environmental change comprise the causes and consequences of people’s individual and collective actions, including the changes which lead to modifications of the earth’s physical and biological systems and affect the human quality of life and sustainable development in different parts of the world.*

The emphasis on HDGC is not only on the human impacts of global change, but also on the role of human activity in creating global change. It is useful to note two kinds of global change in this context: the kinds of change that are global in distribution but not necessarily systemic: soil erosion is one example; versus change that is globally systemic such as ozone depletion and greenhouse gas warming of the atmosphere. HDGC concerns itself with both, but there is a clear imperative to deal with global systemic change. IHDP suggests these components of HDGC:

*THE CENTRAL QUESTIONS to be addressed in the human dimensions of global environmental change research are:*

- **How do human actions contribute to local, regional and global environmental change?**
- **Why are these actions taken?**
- **How does global environmental change feed back into people's lives?**
- **What actions can be taken by whom to reduce and mitigate the adverse effects of global environmental change?**

In the case of any locale - Central and Eastern Europe, Bulgaria, the Struma Basin, Sofia - the fundamental questions in HDGC include:

1. How do human activities contribute to global change, such as greenhouse gas emissions?
2. How do these changes affect global and regional climate?
3. How does climate change affect natural systems such as ecological systems and the hydrologic cycle?
4. How do these environmental system changes affect socio-economic systems such as agricultural productivity, impacts of floods or drought, and human health?
5. Which of these changes represent threats to society, and which present opportunities?
6. What options exist to adapt to threats, and at what cost?
7. What policy changes are necessary to assist in adaptation, and at a larger scale, to contribute to mitigation of activities contributing to global change?
8. How are local policy initiatives assisted or hindered by policy at the national, regional and global level?

9. Can policy changes and human actions address both the causes and consequences of global change?

10. How will alternative futures for the region differ based on such actions taken in the context of processes of change and response to existing human and environmental stresses?

CIRA has developed a framework for addressing such questions; you can see it in the brochures provided or on the CIRA web site.

Can the scientific community alone address these questions? The answer to this question is decidedly “No”. HDGC activity is commonly rooted in a process now known technically as assessment: bringing scientific knowledge to the realm of policy decisions as a collaboration of scientists, stakeholders, and policy makers. Stakeholders viewed widely may include everyone! But more specifically, it is the community of knowledgeable individuals whose activities are directly involved in the causes and impacts of global change: people who produce electric power, water supply managers, farmers, physicians, and the like. Policy-makers are, of course, the elected and appointed individuals - and intellectual leaders - in the community who set the course of future action. How many of these kinds of people are in the room today? What shall we do to bring them to the table with us?

We must recognise that forecasting socio-economic systems even without the consideration of global change is an impossible endeavor. Indeed, serious scientific modellers remain skeptical even of our ability to predict natural systems. This does not mean, however, that we are powerless. A number of research strategies are possible - technological forecasting, demographic modelling, land use modelling, hydrological simulation, simulation of natural and human ecosystems, and using climate scenarios to suggest changes by analogy in contemporary and future situations (such as the Bulgarian drought analogy study). We must constantly remind ourselves and the public that long-term trends in climate and water resources will still be subject to annual and decadal cycles as well as short-term variability that may lead to a false sense of security when conditions are more agreeable than normal.

**HDGC Imperatives in Bulgaria**

In 1997, the nascent Bulgarian global change research community set its own priority agenda for research. It is not for me to substitute my own judgement for those of my learned colleagues present at that time or here today. However, a combination of my own research interests and Bulgarian global change issues as I understand them suggest some important areas of HDGC work:

1. Downscaling from general circulation model results to Bulgarian climate is still at its infancy. There is great opportunity for research in this area;

2. Hydrological impacts are critically important for all the dimensions of water use in Bulgaria. GCMs in general suggest a warmer and drier Bulgaria, with potentially significant seasonal changes in precipitation. Understanding these changes on Bulgarian hydrological regimes is important;

3. Impacts of hydrological change on water resource availability, on water quality, and on the debates over water conservation and dam building are crucial;

4. Direct and indirect impacts of climate change on human health in Bulgaria is equally demanding;
5. Climate and water resource changes on agricultural productivity, taken in conjunction with rejuvenation of the agricultural industry, are vital areas of research;

6. Changes in hydrological regimes, land use and land cover, and soil conservation demand attention;

7. Energy efficiency studies related both to energy supply and energy use will remain focal for addressing Bulgaria’s contribution to greenhouse gas emissions;

8. Similar study of water resource efficiency may be critical in diminishing Bulgaria’s vulnerability to water scarcity in future;

9. Determining how present policy may worsen (or diminish) impacts of global change may provide important criteria for contemporary decision making;

10. But none of these may be as immediately important as rational environmental management and impact assessment policy, so that Bulgaria can preserve the positive aspects of central planning that led to compact urban areas with potential for sustainable development of land use, public transportation, and livable cities, versus the curse of uncontrolled land use and urban sprawl from which the West will be long in recovering. This issue is focal in diminishing Bulgaria’s vulnerability to an unknown future.

Of course, Bulgaria should fully participate, with neighbouring countries in the important IHDP initiatives—all of which have great importance for the region: human security, industrial transformation, land use-land cover, and institutional dimensions.

**Issues in Undertaking HDGC Research in Bulgaria**

Earlier, I suggested that HDGC research is built upon the foundation of “integrated assessment”—not just pure academic research but a collaboration linking academics, stakeholders, and policy makers. I present here a brief list of admonitions to the emerging HDGC community in Bulgaria:

1. HDGC work must recognise the salience of other environmental and social stresses in Bulgaria that may generate greater concern. The global warming perception survey suggests that Bulgarians, just as Americans and Japanese, have many more immediate threatening issues than global change. Thus, HDGC research must explore the ways in which global change will possibly exacerbate or potentially ameliorate these existing stresses.

2. Impacts of global change on human communities is inherently local. The NCCGC must begin a process of reaching out to local institutions and constituencies. This could be organised using existing non-governmental organisations, stakeholder groups, or other strategies. Only by bringing our HDGC research to localities will we receive meaningful feedback from the community and begin to build an awareness so essential for any nation to address the challenges of global change.

3. There are many dimensions of global change research that could benefit from multidisciplinary research being done in Bulgaria that are not presently linked to this agenda. Encouraging wider participation is very important.

4. There are opportunities for building alliances with organisations in other countries and in the international community that must be vigorously pursued.

5. Finally, it may appear easy for the Bulgarian scholarly community to proceed independently of the policy community. There appears to be very little experience in Bulgaria in policy analysis, yet policy is being developed and propagated at the national and perhaps local levels. It is essential that the HDGC research community now embrace the community of stakeholders and
policy makers, itself helping to develop a strong tradition of scholarly reflection on the policy-making process.

Conclusion

In conclusion, we have discussed some of the roots that have led to this workshop; we have explored some core ideas implicit in “human dimensions”; we have suggested some among the many imperatives for HDGC work in Bulgaria; and we have urged that the HDGC effort carefully involve the wider Bulgarian community.

It is left only to wish you every success in your workshop and to state that CIRA remains willing to join with you as you move forward in this important challenge to Bulgaria's future. Thank you.

Selected references:

3. Integrated Regional Assessment of Climate Change: START Central and East European Workshop, 7-12 August 1999. www.essc.psu.edu/cee
Appendix 9

Outline of IHDP

Ramine Shaw, representative of IHDP Secretariat

I. Introduction to IHDP
   i) 4 Science Projects
   ii) Cross-cutting themes and new initiatives

II. National Committees
   i) role and functions
   ii) National Committees around the world

III. Opportunities for HDGEC research

National Committees
Role and functions of a National Committee:
To be the driving force of IHDP activities at the national and regional level
To act as a focal point for the national HD research community
To act as national focal points for regional and international HD research initiatives
Role and functions of a National Committee:
To help raise the awareness and capacity of the national HD research community,
and to engage representatives from NGOs and policy-makers / government in its activities
To set research priorities and foci and to contribute to the international body of knowledge and research on HD issues
To contribute to the scientific research agendas of the IHDP Science Projects (IDGEC, IT, LUCC and GECHS)

National Committees around the world:
30 National Committees and 13 National Contact Points world-wide
   Africa - 11
   Asia - 9
   Oceania - 3
   West and East Europe - 14
   Americas - 6

Cross-Cutting Themes
Joint research initiatives of IGBP, IHDP and WCRP
   Food and Fibre
   Carbon
   Water

Emerging Themes
Emerging Themes within IHDP
   Vulnerability
   global Sustainability
   Earth System Science
   Governance and Institutions

Opportunities for HDGEC research
   Research priority-setting
   Quality research proposals
   Collaboration: IHDP Science Projects
   Collaboration: Other national committees
Appendix 10

“Capacity Building for Bulgarian Human Dimension Programme”

Overview over the Research Activities in the Area of Human Dimensions and Global Change

Prof. Todor Hristov

At the end of 20th century the global change in our planet acquired considerable significance for humankind and nature. Pessimistic prognosis of relatively rapid unfavourable change in living conditions on the Earth arose. This invoked prerequisites and reasons for increasing the amount of research of phenomena in our planet in global and regional aspect. Institutions and research programmes were created, such as:


There are also numerous governmental and non-governmental institutes dealing to a greater or lesser degree with research or environmental management. In the reference book 'Who is doing what for the environment in Bulgaria', published by Vedom, Sofia, developed within the frame of the project 'Nature at Loan' and financed by NATLICAN (Sweden), MOEW and BAS, 211 organisations were referenced: governmental organisations (16), universities (16), research institutes (57), firms and companies (43), non-governmental organisations (52), communities (19), and media (8).

BULGARIAN-AMERICAN WORKSHOP "GLOBAL CHANGE AND BULGARIA"

In 1997 the Bulgarian-American workshop 'Bulgaria and global change' took place at the American University of Blagoevgrad. The workshop was organised within the frame of the programme of CIRA (Center for Integrated Regional Assessment) at Pennsylvania State University and sponsored by the National Scientific Foundation of the USA. The programme envisaged investigation of three regions in our planet: the watershed of Suskehana river, a boundary region with Mexico, and Bulgaria. Scientists from the USA participated, too.

An overview of scientific research in our country regarding problems related to the global change was made in 9 papers:

Bulgaria and greengas discharge - K. Simeonova, H. Hristov, H. Vasilev, S. Todorova
Climate fluctuation and change - Vl. Sharov, E. Koleva, V. Alexandrov
Hydrological fluctuation and global change - G. Gergov, L. Ziapkov, K. Lazarov
Forest coverage, bioproductivity and climate change - Iv. Raev, O. Grozev
Agriculture and climate change - V. Alexandrov
Water resources and risks - S. Gerasimov, N. Nikolova, D. Davidov
As a result of the discussions, a list of the most important themes for further investigation was created. The papers were published in the proceedings "Bulgaria and global Change" under the scientific supervision of T. Hristov, Gr. Knight, D. Mishev, M. Staneva, edited by the NCCGC-BAS, 1999.

NATIONAL CO-ORDINATION CENTER FOR GLOBAL CHANGE - BULGARIAN ACADEMY OF SCIENCES (NCCGC-BAS)

In the course of discussion of the Bulgarian-American workshop in Blagoevgrad, it was concluded that execution of investigations and co-ordination in the field of global change in our country, Europe and all over the world could be done if Bulgaria develops an appropriate organisation, able to support our joining the co-operational network of the international system START, international programmes, etc. An agreement was achieved that a centre for research support and co-ordination at the Bulgarian Academy of Sciences could eventually play such a role. Hence, with decision of the Steering Committee of BAS of 2nd July, 1997 and 25th July 1997, the National Co-ordination Center for global Change at BAS (NCCGC-BAS) with the steering committee, president Dimitar Mishev, secretary Todor Hristov and 10 members was founded.

Since then the Center has performed vigorous activities in the development of a national network of institutes and organisations, scientists and experts working on global change problems. The Center works on improving the informational technological procedure by means of electronic mail of printed materials distribution. A thematic library of magazines, books, brochures, etc. related to the problems of global change or close to it has been created. The list of available literature and materials is attached to the materials of the workshop. They are at disposal of members of the Center, if required.

The Center is in close contact with international organisations such as START, IHDP, GWP, CIRA. The activity of the Center has been supported with a modest donation and the BAS provides heating and lighting for the office.

PROJECT: “CAPACITY BUILDING FOR BULGARIAN HUMAN DIMENSION PROGRAMME”

Considering the candidacy of NCCGC, the Secretariat of the International Programme of Human Dimensions (IHDP) granted the Center the execution of the project “Capacity Building for Bulgarian Human Dimension Programme”. The ongoing workshop is part of the programme execution. Within the project framework, an inquiry to make an inventory of scientific potential - institutions, human resource, projects and publications in the field of human dimensions and global change - was held by e-mail. Inquiry forms were sent to 135 e-mail addresses and 66 replies were obtained. The respondents expressed their consent to be involved in an institutional network (Appendix 1) and in an expert one (Appendix 2).
Diagram showing the distribution of projects and papers by areas of research.

- Industrial Transformation
- Global Environmental Change and Human Security
- Institutionalising Science in Global Environmental Policy
- Land Use and Land Cover Change
- Biodiversity
- Climate Change and Risk Management
- Public Perceptions/Attitude/Behaviour of GEC
- Human Dimensions of GEC in Mountain Regions
- Coastal Zones
- Water/Resource Management and GEC
- Urbanisation
- Health and GEC
- Data Acquisition and Integrated Assessment
- Sustainable Development
- Demographic Processes and the Environment
- Vulnerability and Impact Assessment

Sixty-six projects (Appendix 3) and 197 publications (Appendix 4) were referenced in the inquiry forms. Unfortunately, the time we have in this workshop is not sufficient to allow their narrow scientific annotation, but in Fig.1 an exemplary distribution of the number of projects and papers per various research areas in IHDP programme is given.

Final editing and publishing of a reference book with inquiry results is forthcoming. It is assumed that such a reference book would help direct contact between experts dealing with human dimensions of global change, both in our country and abroad.


The project is being developed in the framework of the contract between the NCCGC and Pennsylvania State University, with the deadline fixed for 2001. Prediction of environmental and social consequences of global climate change has been significant challenge for scientists. Some of the most important problems amongst them are: parallel translocation of the scale of global change to regional climate change, design of climate change impact on hydrological and ecological systems and assessment of the impact importance for economics and society. An
important strategy initiating such investigations is using climatic analogies and on-
going phenomena and projecting them in future times as an integrated regional assessment approach.

Since most of the general circulative models predict the climate in Bulgaria to become hotter and hotter, the project envisages the drought period 1982-1994 as a basic one in order to set the parameters of change in natural, economics and social processes and assess the social risk. The research could serve as an analogy for future climate change and could support the development of efficient adaptive concepts.

The leader of the project is Prof. Ivan Raev from the Forest Institute, and the project itself is financed by Pennsylvania State University. Scientists from 10 scientific institutes of the BAS are involved.

On 27th-28th May a workshop within the project framework was held and the results at this stage were discussed, such as:

Geographic aspects of drought in Bulgaria - S. Velev
Climatic features of drought - N. Slavov, E. Koleva, V. Alexandrov
Drought periods in the 20th century. Definition of the last drought period - E. Koleva, N. Slavov, V. Alexandrov
Sun-Earth interaction - D. Mishev
Drought impact on natural forest ecosystems - I. Raev, B. Rosnev
Drought impact on economics - N. Chkorev, St. Tsonev, S. Totev
Drought impact on water quality - G. Bardarska, H. Dobrev
Water resources in Bulgaria in the drought period. Quantitative merits of water resources in the drought period - S. Gerasimov, M. Genev, E. Bozhilova, T. Orehova
Water resource management in the drought period - T. Hristov, N. Nikolova, S. Yantcheva
Climate impact on population of the basic harmful mouse on the agroecosystems - G. Markov, O. dekov, M. Kotcheva
Population dynamics of birds and mammals in natural ecosystems - G. Markov, M. Gospodinov, G. Penev
Hygienic aspects of drought - G. Gopina, K. Vasilev, V. Kamburova, S. Dimitrov
Sociology and ethic of water: Bulgarian society and water crisis, G. Fotev

All the above works are still being developed. When completed, they will be published in a monography.

Participation in the REGIONAL WORKSHOP OF HUMAN DIMENSIONS OF CENTRAL, EAST EUROPEAN AND NEWLY INDEPENDENT COUNTRIES - Amsterdam, 1999.

A regional workshop of human dimensions of central, eastern European and Newly Independent Countries was held in Amsterdam in 1999 in which 2 representatives of NCCGC, Bulgaria - Dr. Marieta Staneva and Dr. H. Vasilev, participated. They presented a paper named "Human dimensions of global change-research for Bulgaria". Since the theme of the above paper is analogous to the present one, I will restrict myself to mentioning just a few points without which obtaining knowledge of development of the problem would be impossible. A full record of the paper is included in the diskette and you can inform yourself there.
NCCGC-A MEMBER OF THE INTERNATIONAL ORGANISATION GWP (GLOBAL WATER PARTNERSHIP)

On 4th-5th February 1999, Sofia, the NCCGC was the organiser of a workshop of the International organisation GWP for the preparation of the association of East European countries to GWP. The request of the NCCGC was granted and the Center became an associate member of GWP in 1999. Dr. G. Bardarska was involved in the steering group of the organisation, and she has been participating actively in organisation activities.

Participation in the REGIONAL WORKSHOP OF START FOR CENTRAL AND EAST EUROPE ON THEME "INTEGRAL ASSESSMENT OF CLIMATE CHANGE", BUDAPEST, 7-12 AUGUST, 1999

On 7-12th August, 1999 in Budapest, a workshop of START for Central and East Europe on theme "Integral Assessment of Climate Change" was held. The participants from NCCGC were Prof. T. Hristov, G. Bardarska, as well as Dr. Daniela Zlatunova from the University of Sofia, Nikolay Tsankov from the Research Institute for Irrigation, Drainage and Hydraulic Engineering (RIIDHE).

OTHER MEETINGS AND WORKSHOPS

On 5th July 1999, in partnership with the National Center for Environmental and Sustainable Development at the Ministry of Environment and Waters, a Bulgarian-American workshop on the water resource problems in Bulgaria and application of scientific results in practice was organised. The workshop was sponsored by Pennsylvania State University. Four American and more than 25 Bulgarian scientists and experts took part in it.

In October 1999 a workshop on theme ‘Concept for water resource management in Central and East Europe’ in the framework of CEETAG/GWP, Sofia was organised.

It is obvious that the scientific community in Bulgaria is closely involved in world-wide efforts to investigate processes affecting the environmental status of our planet. Although the NCCGC was founded not too long ago, it can be said that it has successfully contributed to combining efforts of various institutions, scientists and experts working and interested in the field of Human Dimensions and global Change, and has supported the improvement of effectiveness of their efforts by making contacts with international organisations and participating in international projects.
Appendix 11

“Capacity Building for Bulgarian Human Dimension Programme”

National Human Dimensions Programme Research Priorities as defined at workshop

1. Information assistance of the problems related to the HD/GEC. GIS developments
2. Water resources and HD/GEC
3. Vulnerability and assessment of the impacts of HD/GEC on the social and economics system
4. Assessment of the regional change on the scale of the global Change (mountain and coastal zones and towns)
5. Sustainable development of the forest and agricultural systems and the global Change
6. Sustainable social and economics development and ecological efficiency
7. Health and global Change
8. Training

Committee Members of Bulgarian NHDP

Prof. PhD Eng. Todor Nikolov Hristov, secretary of NCCGC - President of the Committee
Member of the Academy Alexander Alexandrov - The Forest Institute - Bulgarian Academy of Sciences
Assoc. Prof. PhD Marieta Staneva, Pennsylvania State University
Senior Res. PhD Eng. Plamen Petkov, Director of Research Institute for Irrigation, Drainage and Hydraulic Engineering
Stefan Tzonev, Senior Expert in the National Statistical Institute
Senior Researcher PhD Eng. Asen Lazarov Lazarov, N. Poushkarov Research Institute for Soil Science and Agroecology, Head of department
Senior Researcher PhD Hristo Konsantinov Hristov, Energoproect Company
Assoc. Prof. PhD Petar Lozanov Slaveikov, Sofia University "St. Kliment Ohridski", Faculty of Geology and Geography
Eng. Damian Boitchev, Executive Environment Agency - Ministry of Environment and Waters, Director
India

First Indian National Scientific Steering Committee (SSC) Meeting of the International Human Dimensions Programme (IHDP)

The first open meeting of the SSC involving the following SSC members and a few invited junior scientists representing different programme activities of the IHDP was held on 21-22 April, 2000 at the School of Environmental Sciences, Jawharlal Nehru University, New Delhi, 110067.

Members of the SSC present:

Professor P.S. Ramakrishnan (Convenor)
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Dr. K.G. Saxena (Co-convenor)
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Professor Kanchan Chopra
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Development Alternative,
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The following SSC members could not attend:

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Dr. Arun P. Bali  
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Indian Council of Social Science Research,  
Ministry of Human Resource Development,  
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Dr. Leena Srivastava  
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New Delhi - 110 003

Ms. Mira Meharishi  
Joint Secretary  
Ministry of Environment & Forest  
Government of India  
Paryavaran Bhawan  
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Junior scientists present:

Mr. Amit Kapoor  
C/o Dr. Leena Srivastava  
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Mr. Abhijeet Chatterjee  
C/o Dr. K. Chatterjee  
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Proceedings of the Meeting

The meeting started with a welcome address by P.S. Ramakrishnan, Convenor of the Committee and by J. Subba Rao, Dean of the School of Environmental Sciences, JNU. The Convenor gave a brief account of the genesis behind the formation of the National Committee, thanking IHDP for providing seed money of US$ 2,000 to establish the national committee. The Convenor also highlighted the decision to invite a few selected junior scientists with a first draft of their location-specific individual small research proposals, in order to maximise the benefits accruing from this meeting of the national committee and in order to put a national programme in place.

At the very outset SSC took the decision to involve all the junior scientists present as observers, in order to benefit from their inputs and thus enrich the deliberations of the SSC itself. This had the desired effect right through the deliberations of the national SSC.

A detailed presentation on IHDP, its structure and programme activities that are already in place was given by the Convenor of the national SSC, following which there were detailed discussions on the proposed national level activities. Much of the discussion was centred on what we understand as the key issues of ‘global change’ in the Indian context. All the different components of ‘global change’, namely, climate change, biodiversity depletion, land degradation and desertification, and biological invasion, are equally important in the Indian context, and these issues need to be viewed as interactive, compelling phenomena affecting humans in a variety of different ways and determining human adaptation arising therefrom.

After in-depth discussion involving SSC members and junior scientist, the committee took the decision to initiate and further encourage human dimension research on global change research at two levels, based on national priorities, setting a national agenda, but within the larger objectives of IHDP:

(i) at the individual level of junior scientists, with small-scale funding, for which the current batch of junior scientists were asked to come prepared with their first draft. The idea is to seek funding from a variety of sources, both among national and international funding agencies that operate for the region. With this view in mind, a substantial part of the time was devoted to detailed presentations of individual research proposals and their further refinement.

(ii) co-ordinated research initiatives, possibly with larger funding. These larger initiatives were agreed to be location-specific studies, with regional level analysis of a problem, and/or issue-based studies relevant to the region. It was also agreed to co-ordinate human dimension related global change research with the now well-established Indian National Society of Ecological Economics, in which some of the SSC members are also actively involved.
It was decided to take such a scheme forward through individual efforts appropriately put in by individual SSC members, according their own research interests. The following major co-ordinated initiatives were identified:

- Impacts of Tourism on Natural Resources in Ecologically Fragile Cultural Landscape in the Ganga Watershed of Garhwal Himalaya
- Climate Change and Food Security: Human adaptive strategies - A Regional Case Study
- Natural Resource Management and Sustainable Livelihood Concerns of Traditional Societies in the Mangrove Ecosystem of the Sunderbans
- Climate Change Mitigation through Alternate Renewable Energy Sources: Societal Dimensions - A Regional Case Study Analysis
- Case Study on Impacts of Urbanisation and Industrial Transformation.

(Action to be taken: through correspondence between the JNU-based secretariat, SSC members, and institutions/scientists to be involved in a given co-ordinated initiative).

The following individually-based small-scale projects were approved by the group as a whole, after detailed presentations and discussions on each one of them. It was agreed that the SSC will certify that these were developed after critical evaluation of the projects during the national workshop; it was felt that this might carry some weight with individual funding agencies, when a given project is submitted for funding.

**The small projects considered by the SSC are:**

(i) Vivek Kumar

**Topic:** Impacts of climate change on agriculture: Identifying an adaptation strategy. The aim is to identify a sound and cost-effective strategy to adapt to impacts of climate change: fluctuations in climate and the related uncertainties regarding Indian agriculture. The project is to be based on a study of a few districts/villages.

**Comments:**

Compare two contrasting ecological situations in the same region. Consider in a situation like Rajasthan where you wish to work. Apart from traditional crops like wheat, consider shifts towards lesser-known crops, e.g. millets, etc. with high and low rainfall events.

(ii) Dr. Ratna Bhattacharya

**Topic:** A comparative analysis on exploitation of natural resources and human security in the tribal region of Bastar, M.P.

An energy crisis and a threatening food crisis seem to indicate that environmental resources can no longer sustain the tribal population of Bastar. The aim is to have a `Crop-weather watch' (seasonal), to demarcate the most-favoured areas for intensified agricultural production through water management and design strategies for rehabilitation measures in the areas most seriously affected by drought or floods.

**Comments:**

Collect baseline data for the region with a view to defining a measure for `Land carrying capacity'; do an inter-disciplinary study taking into consideration earlier work done.
(iii) S.P. Sati

Topic: Impact of tourism on land resources between Rishikesh and Badrinath. The aim is to study the impact of tourism on natural resources in the region and design strategies to minimise pressure on land-based resources.
Comments: Concentrate on two to three aspects in a carefully selected location.

(iv) S. Sreekesh

Topic: Land use / Land cover change and land degradation: A case study from Western Ghats, Goa, India. The aim is to examine the land degradation resulting from land use and to study land cover changes and the role of socio-economic and institutional drivers and factors influencing these changes in a sub-watershed in Western Ghats of Goa, India.

(v) Abhijit Chatterjee,

Topic: North-South partnership for climate change mitigation - a case study analysis for the Indian Energy Sector. The aim is to facilitate mutually beneficial and meaningful partnerships to promote investment in the Indian energy sector. Investments will target GHG mitigation and promote sustainable development in India. Also, the incentive structure prevalent in the Indian energy sector is to be studied. An outline of baseline information for climate change mitigation in the above sectors is to be established. And Indian priorities for Sustainable Development in relation to climate change projects are to be examined.
Comments: Select two states in one of which government is giving priorities to renewable energy resources and in the other of which it is not and study the effect of technological transformation on social transformation.

(vi) A. Saikia

Topic: Human-action-triggered land use changed in Karbi, Anglong and Kamrup, Districts of Assam. The proposal seeks to explore the ecological footprints that have occurred in the study area in the past three decades owing to connection with the urban centre at Gauhati and link up internal forces with externalities. Land use and land cover changes will be analysed using remote sensing data and GIS techniques which could be efficient, cost-effective and speedy in understanding natural resource degradation. Possible ameliorative measures will be considered.
Comments: Consider the impact of logging influences on shifting cultivation in shifting agriculture affected areas.

(vii) Barun Mukhopadhyaya

Topic: Relationship between people and forest vis-à-vis impact of forest depletion on livelihood issues of people in Sikkim Himalaya. The proposed study will investigate the relationship between people and forests as well as the impact of the forest depletion on the livelihood issues of the ethnic communities in the Sikkim Himalaya.
This study is an attempt to assess the problems of natural resource management in terms biodiversity depletion (according forest depletion) and its impacts on the livelihood issues of local ethnic communities, purported for examining aspects of human dimensions of global change.

Comments:
Consider South Sikkim region where biodiversity depletion has just started happening.
Incorporate people from G.B. Pant Institute and the only NGO working in that area.

(viii) Dr. J.C. Kuniyal and Dr. S.C.R. Vishwakarma

Increasing tourism has resulted in more generation of solid waste. There is no proper and environmentally safe disposal means for the solid waste. Therefore, it is important to identify techniques that will mitigate solid waste on one land and provide energy to the farmers on the other.
Comments:
Emphasis should be laid on the human dimensions of tourism impacts.

(ix) Amit Kapur

Topic: To analyse the impact of steel, paper and pulp, cement, and coal industrial activities.
An inventory of wastes and emissions is to be made as well as a review of existing technologies with respect to pollution abatement. The project will also look at possible, eco-friendly substitutes for existing raw materials and analyse policy interventions to promote Sustainable Consumerism (Market-leased instruments, ‘Green marketing’).
Comments: The objective is too ambitious. A focused analysis is required.

Concluding remarks:

It was emphasised by the SSC members that we should consider from time to time the directions/ pathways to be followed for enabling natural and social sciences to work together. Whilst doing so the emphasis should be on regional issues, such as the issue of water in a developing country context, so as to contribute towards a better understanding of global change issues.

The two-day workshop and the first national human dimension programme (NHDP) SSC was concluded, agreeing to keep in touch with each other in the SSC and the interested scientists within the country, via mail.

P.S. Ramakrishnan (Convenor)
1. Foreword

It is now evident that an understanding of and the solutions to global environmental changes based solely on physical, chemical and biological approaches are limited. These approaches must encompass the reciprocal interactions between man/woman and his/her environment. Thus, it is apparently necessary that research in the social sciences help prevent and lessen the physical damage done by humans to the environment.

After two days of intense and constructive debates, the first Ivorian forum on human dimensions of global environmental changes ended on May 27, 1999. About forty participants from the local universities, the public and private sectors, and the NGOs attended the meeting. One of the outcome of this forum has been the establishment of a dynamic and interactive network of researchers from varied disciplines to collaborate and tackle the different aspects of human dimensions of global environmental changes in Côte d'Ivoire.

The objectives of this forum were to identify both the social, natural, political, and economic parameters responsible for the global environmental changes in Côte d'Ivoire, and reciprocally the human reactions to these changes.

Thirteen presentations dealt with the relations between humans and society and the components of Global Environmental Change, such as climate change, agriculture and health, land use and land property, resource use and conflicts, urbanisation and human vulnerability and security.

After ten months of hard work in preparing this meeting, we have taken an important step forward by establishing the first IHDP committee in West Africa. As mentioned above, we have also set up a network of scientists interested in the human dimensions of global environmental changes.

We would particularly like to thank the National Centre for Remote Sensing and Geographical Information (C.N.T.I.G.), and the French Mission of Action and Co-operation in Côte d'Ivoire. Furthermore we would like to thank the University of Abobo-Adjamé for their financial assistance in addition to the financial support from the IHDP Secretariat which made this workshop possible. The Committee wishes to express its sincere appreciation to all the participants in the workshop, particularly to Dr. Mame Demba Thiam from the Senegal Committee. We sincerely acknowledge the direct assistance of Ms Ramine Shaw and Ms. Renate Duckat from the IHDP secretariat. We also acknowledge Prof. Akilagpa Sawyerr (IHDP-SC Member) for his scientific supervision during the workshop, Dr. Abdourahamane Konaré (Chairman of the IHDP Committee) and Prof. Alain Sissoko.
2. The Programme

Opening and Closing Speeches

Welcoming speech: Dr. Abdourahamane Konaré, Chairman of the Côte d'Ivoire Human Dimensions Programme Committee (IHDP-CI)

Dr. Konaré welcomed the participants to the first forum on human dimensions of global environmental change. After having outlined the objectives of IHDP-CI committee and the goal sought through this forum, Dr. Konaré insisted on the need to create a synergy among researchers so as to promote the human dimension of global environmental change. The presence of the first technical advisor to the Minister of Higher Education and Research, the director of scientific research and both the presidents of the two universities in Abidjan at the opening ceremony attest the interest the government of Côte d'Ivoire has in IHDP.

Dr. Konaré particularly thanked the IHDP Secretariat from Bonn, the Centre National de Télédétection et de l'Information Géographique (CNTIG) of Côte d'Ivoire and the "Mission de Coopération Française" in Côte d'Ivoire for their financial help.

Message from the Executive Director of IHDP

Dr. Jill Jäger (read by Dr. Thiam Mame Demba)

The IHDP is pleased to welcome the new National Human Dimensions Committee of the Côte d'Ivoire to the growing network of these committees world-wide. We look forward to hearing about the activities of the committee and the wider human dimensions research community in your country and will always be happy to support you in whatever ways we can. Research on the human dimensions of global environmental change is essential in order to improve understanding of the human causes and consequences of environmental changes, as well as the individual and societal responses to it. The community of scholars involved in this kind of research is growing world-wide, and the IHDP "seed money" initiative is contributing to the development of networks in a number of developing countries. The Côte d'Ivoire Committee is one of the first that we have supported and we wish you great success!

2.1.3 Message from Prof. Akilagpa Sawyerr, member of the International Scientific Committee of IHDP.

Professor Akilagpa Sawyerr expressed his happiness to help kick off the first activities of the newly founded HDP in Côte d'Ivoire. He also welcomed this committee to the international network IHDP. On behalf of the IHDP he thanked the Ivorian committee for their initiative to create, develop, and strengthen research activities on human dimensions of global environmental changes. He assured the committee of the will of IHDP to help it achieve its goals in Côte d'Ivoire.

2.1.4 Opening speech: Message from the Minister of Higher Education and Scientific Research

While sharing the concern of the participants at the national forum on human dimensions in global environmental changes, the minister asked the participants to identify the social, political, and economical variables responsible for the
environmental changes. He also promised that his ministry would do whatever it
could to help the IHDP-CI reach its goal.

2.1.5 Closing speech: by Professor Aïdara Daouda President of the University of Abobo-Adjamé.

First, he congratulated the participants for the work done in so little time. He then
depicted some examples of detrimental influences of man towards its environmental
and vice versa. He congratulated the committee for its endeavour to promote the
Human Dimension Programme of GEC. He promised the committee the continued
support of the University of Abobo-Adjamé. Moreover, he announced that the
University of Abobo-Adjamé would be able to house the offices of the newly created
IHDP Committee. Finally, it was on this note of high hopes that Prof. Aïdara ended
the two-day workshop of the HDP committee of Côte d'Ivoire.

2.2 Roundtable of the Participants: The IHDP Missions

In the second half of the morning, the participants introduced themselves and
showed their interest in collaborating through IHDP. In this roundtable, the
participants identified the research activities in progress and the likelihood of
reciprocal collaboration among them. It appeared that most of the participants were
not aware of IHDP’s mission throughout the world and particularly in Africa. Dr.
Thiam Mame Demba clearly presented the objectives of IHDP, and also referred to
the four interest areas of IHDP research.
Dr. Konaré Abdourahamane presented the IHDP-CI committee and its members.
Then he commented on the major points and steps leading to the creation of IHDP-
CI and the holding of the first forum on human dimensions in global environmental
changes in Côte d'Ivoire.

2.3 Session on Management of Ecosystems in Côte d'Ivoire

This session on ecosystem management started on Wednesday afternoon at 15h
with the message of Prof Akilagpa Sawyerr (2.1.4) followed by a series of five talks
covering diverse aspects of the human dimension of changing land use, human
settlements and land cover patterns in Côte d'Ivoire.

2.3.1 Mr. Vincent Beligné, Program Co-ordinator of ECOSYN – West Africa.

His talked about the management of natural ecosystems. In particular, he urged
SODEFOR to take into account the human dimension factor in its broadened goal of
managing protected forests, parks and natural reserves. One of the mandates of
SODEFOR consisted of renewing the dialog between SODEFOR personnel and the
population dwelling along edges of the parks through consultation authorities such as
the commission "Peasant-Forest". However, the speaker noticed the difficulties in
reconciling the objectives of that dialog with the peasants living in the vicinity of the
parks with the need to protect every "single square metre" of the parks through
increased monitoring.
2.3.2 Mr. Touré Augustin, Associate Professor, Institut de Géographie Tropicale (IGT), department of Sciences on Human and Society, University of Cocody.

He briefly presented the results of work done on drought and rural development through the management of the lowland ecosystems in the Tagbana region. The objectives of Mr. Touré’s work were to show that rural development policy could make the most of the drought through management of the lowland in the Tagbana region. However, there might be some drawbacks. The population did not fully benefit from the management of these lowlands.

2.3.3 Mr Abou Bamba, Programme Officer of the Network for Environment and sustainable development in Africa (NESDA).

In this speech, Mr Bamba first defined what is meant by conflict, environment and environmental resources using examples on the African continent. Then, he went on over the main conflicts now crippling Africa while emphasising interaction between conflict prevention and resolution and environmental issues. The speaker argued that political and economic problems were the causes of African conflicts leading to transhumance that was detrimental to the environment.

2.3.4 Mr. Koli Bi Zueli, Associate Professor, Institut de Géographie Tropicale (IGT), department of Sciences on Human and Society, University of Cocody.

He presented two cases of human behaviour towards the system of land tenures in the forest-region of Côte d’Ivoire. He acknowledged that the traditional (indigenous) land ownership system was currently going through a crisis. Certain factors such as government agricultural policies and short-term objectives set by the peasants were contributing to excessive “exploitation” (use) of the natural resources and hence to the degradation of the environment.

2.3.5 Mr. Atta Kouakou, Lecturer, Institut de Géographie Tropicale (IGT), department of Sciences on Human and Society, University of Cocody.

He presented the results of work on "human pressures on and management of forest ecosystems". The study site was the protected forest of Beki in Côte d'Ivoire. It was apparent from the maps shown by the speaker that the human pressures on the protected forest had reached an alarming level. He recommended that the authorities devise a strategy that would be in line with both our agricultural policy and forest and natural reserve protection program.

2.4 Session on Urbanisation and Society

This session began on Thursday May 27th, 1999. Three talks were given.

2.4.1 Mr Sissoko Alain, Dean of the Faculty of Criminology, University of Cocody.

The title of his speech was "Urbanisation and human risks: case of the deprived children of Abidjan". The causes of the problem, according to Prof. Sissoko, were
extreme poverty, family breakdown or divorce, individualism, and moral crisis. One of the solutions was a reform of ailing governmental institutions such as the Justice department, the police and the information and education departments; the community at large should also try its own solutions and had to be involved in the design, the definition and the implementation of social projects.

2.4.2 Mr. Dembélé Ousmane, Associate Professor, Institut de Géographie Tropicale (IGT), department of Sciences on Human and Society, University of Cocody.

He asked the participants to ponder on the representation of urban environment and sustainable development. Dr. Dembélé noted that scientists did obtain excellent results on urban environmental problems such as ecosystems, atmospheric pollution... However, most difficulties and failures arose in the implementation of these research results. Historically, the urban populations were indexed or labelled as bad citizens or insensitive to the environmental issues. Nowadays, it was becoming accepted that the root of the problem resided in the fact that the scientists and the non-scientists did not see the environment with the same eye. Therefore, it was incumbent upon the scientists not to lose sight of what the environment meant to the outside world when they were tackling the environmental problems.

2.4.3 Mr. Alla Della, Associate Professor, Institut de Géographie Tropicale (IGT), department of Sciences on Human and Society, University of Cocody.

His topic was urbanisation and urban risks in Abidjan. Dr. Alla warned that urban risks and georisks were quite alarming in Abidjan. These georisks were, among others, erosion, floods, landslide and sinkholes. There was a high record of urban growth in Abidjan and particularly of the economically low or unstable part of the population. Since this component of the population was not rich, it could only afford shanty houses that were very prone to the georisks mentioned above. All in all, it should be understood that these populations were not unaware of risks they faced, but because of their economic status, they could not afford better living conditions.

2.5 Session on climate-agriculture-health and environment

This part started at 14h30 and ended at 17h30. The following five talks were given.

2.5.1 Mr Zabi Guillaume, Technical advisor of the Minister of Tourism,

Defined the new dimensions of the environment which are based on the role of the environment and the monitoring mechanism of "Agenda 21".

2.5.2 Mr. N'goran Eliezer, Associate Professor, Department of Bio-sciences, University of Cocody.

He talked about management of dams and its impact on health in Côte d'Ivoire, referring to the example of the schistosomes or Bilharziose. The speaker showed that there was an increase in the prevalence and intensity of schistosomiasis following the construction of dams. Infestation is more significant with bigger dams.
2.5.3 Dr. Ouattara Adama, Assistant Professor, Centre Universitaire de Recherche Appliquée en Télédétection (CURAT), University of Cocody.

He presented how remote sensing, global positioning system (GPS) and geography information systems (GIS) could be integrated into our agriculture. The speaker maintained that with the tools and techniques above, the peasants could produce more and better while limiting the harmful effects agriculture had on the environment.

2.5.4 Dr. N’Guettia René, Chef de cabinet, Ministère Délégué auprès du Ministère de l’Agriculture et des ressources animales chargé des jeunes exploitants agricoles.

He talked about the impacts of climate changes on agriculture in Côte d’Ivoire. Crop yields were sensitive to the variation of the climate. However not all the crops behaved in the same way. The speaker convincingly showed how a decline in rainfall in Côte d’Ivoire affected the yield of palm tree even in regions considered humid.

2.5.5 Dr. ZOBO Jean Claude, expert-consultant

He dealt with the management of frigorific fluids in Côte d'Ivoire. According to the Montreal accord, new and environmentally friendly frigorific fluids should be used in air conditioners and refrigerators. The speaker showed the difficulties and constraints in applying that accord in Côte d'Ivoire.

3. Recommendations and Follow-up

3.1 Key Human Dimensions Research Areas in a Random Order

Knowledge of intensive agriculture, food security and precision farming
Ecosystem management and biodiversity degradation and loss
Air, water and pollution
Human security / conflicts / settlement of refugees
Unemployment/ poverty / deprived children / juvenile delinquency
Demography/ rural-urban migration / urbanisation
Diseases in humans and livestock / human health /
Unemployment / economic mismanagement /
Household economics and vulnerability
Climatic change
Industrial transformation / energy
Desertification / deforestation
Ethical, political and legislative aspects of GEC

3.2 Recommendations

Among the remarks made by the participants, the most important points were the following:

1- The human dimension is forgotten in big projects of land management in Côte d’Ivoire.
2- There is no co-ordination among the different researchers working on human dimensions in global environmental change.
3- No economists attended the workshop.
4- There was only a low representation of women among the participants, with no women among the speakers.

Some of the recommendations made were:

1- Study the environmental impacts of the development policy.
2- Make the environmental laws more understandable to all the population.
3- As a priority, the committee of Côte d’Ivoire must work alongside with national research centres to ensure that the human dimension factor is taken into account in national environmental policy.
4- The committee of Côte d’Ivoire must be a role player in the implementation of the conventions on climatic change, biological diversity and desertification.
5- The Committee should work hard to attract more women members.
6- More research is required on the causes of deforestation and alternative technologies to mitigate the impacts.
7- The committee should develop the study of socio-economic aspects of GEC.
8- More research on deprived children/urbanisation/ human risks is required.
9- The committee must increase environmental awareness among the rural population.

3.3 Follow-Up Activities

The IHDP Project for Côte d’Ivoire must be conducted through a science plan carried out by the Scientific Council (see status, III-1) that will commit resources to the research programme. The project is outlined in a science plan, and the research activities are detailed in an implementation plan that will evolve as the project progresses. The project is guided by a Scientific Committee (status III-2) and at a national level each Human dimensions programme has its own steering committee.

**First step**: (August-December, 1999)
- Inauguration of the secretariat of the IHDP Committee
- Identification of the members of the Scientific Council
- Completion of Scientific Committee membership in relation to key human dimensions issues among scholars active in human dimensions research.

**Second step**: (August 1999 - April 2000)
For each human dimension issue, the contact person is responsible for the science plan, the implementation plan and the identification of the members of the scientific steering committee, (the scientific committee could assist here if necessary).

**Third step**: (June 2000)
The annual workshop of Côte d'Ivoire HD Committee: Presentation of the Science plans and call for funding opportunities to carry out research.
4. Appendices

Appendix A: Workshop Programme

Wednesday, 26 May 1999
8h30 Registration
9h30 Opening ceremony
Welcome message (Dr Abdourahamane Konaré, National committee)
Message from IHDP (Dr Thiam Mame Demba)
Message from the Minister of higher education and scientific research (N’guessan
Zoukou, first technical advisor to the Minister)
10h30 Welcome cocktail
11h Round table: open discussion on IHDP
12h Lunch

15h Session 1: Management of ecosystems in Côte d’Ivoire Coordinator : Dr
Abdourahamane Sangaré
1. Management of natural ecosystems (Vincent Béligné, ECOSYN Programme co-
ordonnator)
2. Drought and rural development through management of lowland ecosystems in the
tagbana region (Côte d’Ivoire). (Touré Augustin, Human and Society Research Unit,
University of Cocody)
3. Conflicts and environments in Africa (Abou Bamba, Programme officer, NESDA)
4. Niablé and Soubré: Two cases of human behaviour towards land tenure problems
in the forest region of Côte d’Ivoire (Koli bi Zuéli, Human and Society Research Unit,
University of Cocody)
5. Human pressure and management of forest ecosystem in the protected forest of
Beki (Eastern Côte d’Ivoire) (Atta Jean Marie, Human and Society Research Unit,
University of Cocody)
16h30 Coffee break
17h45 Recommendations from session 1.
18h30 End. Thursday, 27 May 1999

08h30 Session 2: Urbanisation and Society Coordinator: Prof Alain Sissoko
6. Urbanisation and human risks: case of deprived children in Abidjan
(Alain Sissoko, Dean of Criminology Research Unit, University of Cocody)
7. Perceptions of urban environment and sustainable development. (Dembélé
Ousmane, Human and Society Research Unit, University of Cocody)
8. Urbanisation and georisks in Abidjan (Alla André, Human and Society Research
Unit, University of Cocody)
10h30 Coffee break
11h Open discussion on Urbanisation and Society in Côte d’Ivoire
11h30 Recommendations on the session 2.
12h30 Lunch

14h30 Session 3: Agriculture, Climate, Health and Environment Coordinator: Dr.
Brou Yao Telesphore
9. New dimension of the Environment (Zabi Guillaume, Technical advisor of the
Ministry of Tourism)
10. Impacts of dams on health in Côte d’Ivoire: case of shistosomes or bilharziosis
(Ngoran Eliezer, Bio-sciences Research Unit, University of Cocody)
11. Climate change impact on the production of some cultures (Nguettia Réné, principal private secretary of the Minister of young farmers)
12. Integration of remote sensing, GPS and GIS into a modern agriculture: Precision farming (Ouattara Adama, Applied Remote Sensing Research Centre, University of Cocody)
13. Management of frigorific fluids in Côte d’Ivoire (Zobo Jean Claude, IPNETP)
16h30 Coffee break
17h Open discussion on Session 3
17h45 Recommendations on the session.
18h Adoption of recommendations per session
18h30 Closing speech of the workshop (Aidara Daouda, President of the University of Abobo-Adjamé).
Appendix B: List of participants

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Appendix C: About The Scientific Council of the Côte d'Ivoire committee

The scientific council is the supreme body of the Côte d'Ivoire HDP committee. It will have to define the scientific contents of the programmes, to advise committee on the scientific priorities of the programme, to evaluate the results and to make recommendations of them on the general policy of committee IHDP Côte d'Ivoire. The scientific council is composed of associate members recognised by the scientific committee and selected among the following organisations based in Côte d'Ivoire:

national organisations : They are the public structures, the non – governmental organisations and the private sector, who will have expressed their interest in the development and the reinforcement of the programmes of the Côte d'Ivoire IHDP committee.

international and regional organisations: In fact, the interdisciplinary, intergovernmental, regional and international structures as well as non – governmental organisation that have expressed their interest in the development and the of the programmes of the Côte d'Ivoire IHDP committee.

The national representatives of the programmes such as International Geosphere Biosphere Programme (IGBP) and World Climate Research Programme (WCRP). The scientific council of the Côte d'Ivoire IHDP committee has a principal role to promote a platform of co-operation between the scientific committee and its members. It will ensure the connection and will facilitate collaboration with other international organisations both governmental and non -governmental including the system of the United Nations. The scientific council meets every year on order of the president of the Côte d'Ivoire HDP committee. Extraordinary meetings can be convened by two thirds of the members of the scientific council. Other organisations can be invited to the meetings of the scientific council.
Mexico

Annotated Bibliography and Inventory of Specialists

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1. Introduction

In Mexico, hundreds of researchers, decision-makers and stakeholders are involved in the analysis and management of the “human” dimensions of environmental issues, i.e. “the ways in which individuals and societies: (a) contribute to global environmental change; (b) are influenced by global environmental change; and (c) mitigate and adapt to global environmental change”.

Different programmes, networks and decision-making groups, such as LEAD-Mexico, the National Network of Water-Analysts and the Mexican Network for the Analysis and Prevention of Disasters, have been established in order to understand human dimensions of environmental phenomena such as risks, disasters, erosion, land-use change, loss of species, air contamination, water pollution and emission of greenhouse gases. Different activities have been developed within these programmes and networks, namely seminars and workshops, “virtual” interchange of ideas, research projects, general and specific public policies and environment-related publications. Nevertheless, Mexico lacks an inventory of who is promoting such programmes and networks, which research activities are undertaken and what the results (publications) of such activities are.

The main goal of the present document is to present an annotated bibliography of human dimensions related authors and papers (Sections 2 and 3), as well as an inventory of academics, decision-makers, stakeholders and other environmental specialists (Section 4). Our compilation will serve as the first step of a twofold purpose. First, to connect people involved in the activities referred to above. Second, to promote the creation of the national Mexican Network for the Human Dimensions Programme of Environmental Change.

The preparation of the document proceeded in a series of steps. Co-ordinators and organisers of Mexican environmental programmes and networks were contacted. The members of the latter were requested to send us the following information:
- personal and professional information;
- environmental projects they have been involved in;
- results of the projects they have been involved in (books, articles and other publications); and
- data (names, institution and e-mails) of environmental specialists they know.

After more than three months (January-April 2000), only around 50 persons had sent their information (Table 3). Hence we decided to gather indirect information to build the inventory of researchers and environmental specialists, i.e. to build our inventory based on the directories of LEAD-Mexico and the National Network of Water

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3 IHDP (1998, 1).
4 One of the most well-known researchers’ answers to our invitation letter was that he had not analysed the human dimensions. To avoid problems, we decided hence not to include his name in the inventory, but only his publications.
Researchers\(^5\), on the information of the authors and papers related bibliography of environmental issues\(^6\), and on our personal contacts, analyses and retrieval. Therefore we ask the reader to keep in mind that part of the information of Table 4 could not be as precise as the information of Table 3.

After concluding the data collection and organisation of the information obtained, we prepared and edited the present document, which comprises a description of the main environmental issues (Chapter 2), the “Bibliography of Environmental Issues” (Chapter 3), as well as an inventory of environmental specialists, the principal problems they work on and the results of their efforts (Chapter 4).

2. Key Environmental Issues

This section comprises statistical information (Table 1) and a concise description of the main environmental issues analysed in the books, chapters of books and chapters of proceedings, documents, and working and research reports presented in the “Bibliography of environmental issues”. The “Key Human Dimensions Research Themes of 28 National Committees and Programmes”\(^7\) was used to derive the themes.

There are two important observations that can be derived from the description of Mexican key environmental themes and by comparing them with the ones identified in other IHDP or IPCC documents. On one hand some internationally relevant issues such as deforestation and urbanisation are analysed by Mexican academics, decision-makers and stakeholders with the same intensity as in industrialised countries, although in a relatively lower number of research projects, because of the smaller national financial resources available. On the other hand, some environmental issues are considered which are not perceived as relevant on the international scale but are typical human dimensions concerns of national or regional environmental changes of Mexico and/or other underdeveloped countries, namely land reform, small-scale agriculture of peasants, or the “favela syndrome”\(^8\).

The land reform, intimately related to the Mexican Revolution of 1910, is one example of typical Mexican human dimensions of environmental change. Between 1917 and 1991, 2 million “ejidatarios” and more than 500 thousand “comuneros” were endowed with land titles. Nevertheless, land propriety and agricultural production are still unequally distributed in Mexico.\(^9\) From the 1940s on, Mexican authorities have not implemented enough sufficiently designed policies aimed at

\(^5\) We thank LEAD-Mexico and the National Network of Water Researchers for their help in the elaboration of the present inventory.

\(^6\) It was difficult for us to gather the information of the libraries. Most of the libraries of Mexican environmental public agencies have a very low and poorly classified percentage of their environmental publications. Only few libraries of universities and other academic institutions have environmental publications.

\(^7\) IHDP (1999, Figures I and II).

\(^8\) The Scientific Council of the German Government for Global Environmental Changes (Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen - WBGU) states that “the favela syndrome” describes the process of unplanned, informal and therefore environmentally risky urbanisation, driven by rural emigration [and] caused by the high attraction power of the cities, [and the lack of employmen opportunities in the countryside.] It is characterised among other things by [growing] tendencies of misery, like the creation of slums and illegal settlements of shantytowns. And it is accompanied by the [frequent] occurrence of problems like overload [of carrying capacity], [damages to] infrastructure and environment as well as (socio-economic or ethnic) segregation. WBGU (1997, 144-145. Additional remarks in parenthesis by translator E. Duffing).

\(^9\) Comuneros and ejidatarios are peasants, with common propriety of their resources.
developing the agricultural sector, such as credits, technical support and social welfare. All these factors, together with the inability of Mexican industrial and tertiary sectors to create enough well-paid jobs drive typical Mexican environmental phenomena: in the countryside the degradation of soils and agricultural land and in the urban areas the “favelas syndrome”.\(^{10}\)

For Mexican researchers – as for researchers of other countries – environmental issues are not necessarily the same or equally important as for specialists involved in international environmental forums. Global climate change is one example of an issue of which there are different perceptions. Few Mexicans are involved in the analysis and management of the climate problem. Most of the studies assess the implications of climate change for agriculture, fisheries, forests and other regional activities and natural resources. The recognition of that national distinction has led us to clarify, when necessary, the meaning and importance Mexicans give to some environmental issues, as well as to describe some historical, economic, social, political and cultural aspects that help to explain the priorities in Mexico.

Most environmental issues are interrelated. Biodiversity, for example, is linked to legal and tenure aspects, as well as to management, to technology and to social participation. Agriculture is connected to water demand and supply, and urbanisation is related to demographic charge. So a number of projects are classified somewhat arbitrarily and could just as well be assigned to other categories.

Some of the issues included in our description, such as soil analysis, techniques of construction and operation of dams, or monitoring of water quality, might not seem to belong to the human dimensions of environmental change. Nevertheless they have been included in the present compilation, as they are tightly linked to and drivers of the human dimensions of environmental change.

**Attitudes/perceptions/behaviour**

The most important research issues are:
- pre-columbian and present indigenous perceptions about the use and management of natural resources;
- linkages between management of natural resources, culture and society;
- traditional knowledge and management of natural resources. Scholars who study agriculture, tend to compare traditional with "conventional" management systems (i.e. systems based on the “Green Revolution” paradigm;
- environmental awareness, culture and global change;
- agrarian myths and rituals regarding nature / society linkages;
- perceptions of demographic change; perceptions of cattle ranchers and farmers (peasants about environmental deterioration; values, attitudes and behaviour of managers and farmers about their specific environmental problems and policies). Some of these studies use the tools developed by Inglehart, Dunlap and other scholars to analyse the influence of values and attitudes (environmental awareness) on the behaviour of target groups.

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\(^{10}\) According to the Mexican Ministry of Environment (SEMARNAP) 36% of Mexico’s land is degraded through low impact erosion, 34.3% through medium-impact erosion and 20.5% through severe erosion. SEMARNAP (1996c, Tables 11 and 3).
Agriculture and cattle

Both issues – especially agriculture – are the most frequent ones in the bibliography of environmental issues. Agriculture has been a subject of reflection and management in Mexico for many decades. This section comprises studies about: present conditions of Mexican agriculture; historical and present Mexican agricultural regions; rural development, integrated management of agricultural resources; linkages between climate change (rain intensity and frequency, frost incidence) and agricultural crisis in the history of Mexico; the Mexican food system; food self-sufficiency; potential food resources, water and energy in the food chain, food supply for Mexico City; small-scale and market-orientated agriculture. Contrary to the industrialised countries, where the majority of the farmers apply conventional production systems and are orientated on the market, this kind of production has not become a general phenomenon in Mexico. Besides market-orientated farmers, there are different groups of peasants who apply different production systems and only share one common feature: it is difficult and sometimes impossible for them to obtain enough income in their agricultural activities. Both kinds of agriculture are associated with different environmental problems, analysed by some of the studies included in the “bibliography of environmental issues”; irrigation: history of Mexican irrigation (since Pre-Columbian Mexico); irrigation policies of the Mexican government; small irrigation systems; irrigation and land reform; governmental policies, institutions and capacities of self-managed organisations to manage their irrigation systems; land reform and agricultural conservation strategies; cattle. Competition among agriculture and cattle for land use; peasant family dynamics and cattle in rural areas; conversion of peasants’ land from agriculture to pasture; other agricultural issues. Linkages between agriculture and other resources (water, forests); features and management of agricultural plagues; technological innovation in Mexican haciendas during the XIX century; alternatives of technological development, agro-meteorology and agro-ecology.

Water

This is another frequent issue in the bibliography, analysed and managed during decades in Mexico, although at least two changes in the emphasis of the studies have surfaced in the last twenty years. It had been assumed till the end of the 1970s that water was inexhaustible, and that the state was the best and most important manager of water. Today it is recognised that water has become a scarce resource. Some scholars – privatisation advocates – point out that market and private property should drive the uses and management of water and its allocation. Others argue that there is not only one way – state or private – to warranty an adequate management of water resources, and that the particular institutional arrangement of each community should be analysed in each case. Influences of this discussion can be traced in the different ways water-related studies are presented: diagnosis of Mexican water resources; quantity, quality, and spatial distribution of water; the monitoring and indicators of water quality; the analysis of pollution of aquifers, and of the exploitation of groundwater in desert zones; social uses of water (agricultural, industrial, domestic) in Mexico and in its different regions and cities; conditions and strategies for the management of an efficient use of water; rural and urban water scarcity, water legislation; techniques of construction and operation of dams and reservoirs; history of water management in Mexico; water and bureaucracy in colonial times; present schemes of water management (economic instruments,

Since the 1960s, Mexico has imported an increasing percentage of its corn and beans requirements, although around 25% of its Economic Active Population is employed in the agricultural sector. So for some scholars, Mexico is politically vulnerable in particular to the USA and other trade partners.
regulation); water legislation; social and environmental impact of water supply, sewage, irrigation and other hydraulic infrastructure systems; other issues, like water and social conflicts; historical and present water/culture linkages, peasant production of water, water basins and industrial corridors.

**Natural reserves, protected areas, national parks**

The different studies about these issues have become important in Mexico during recent years and concentrate on: public conservation, use and management; integrated management of natural resources in these areas; ecological regulation, land use; legislation, marketable emission permits, property rights; tourist activities and their regulation.

**Biodiversity and genetically modified organisms**

For different reasons these have become key issues for Mexican academics, decision-makers and stake-holders in the last years. Biologically Mexico is one of the most diversified countries in the world. Biodiversity has become a key issue in global environmental forums, and it is an important foundation for biotechnology. The other two pressing aspects are technical knowledge and the institutional capacity for regulating and managing both biodiversity and biotechnology. Some specialists are analysing Mexican biological diversity and looking for mechanisms to manage our deficiencies in that area. The documents included in our bibliography deal with: conservation and management of Mexican biodiversity; legislation and economic value of biodiversity; genetic improvement of vegetables; genetic biodiversity of agricultural seeds, biotechnology, industrial production of seeds; ethno-botany and germinal plasma; the biological conquest of America.

**Forests and forestry**

Like agriculture, forests in Mexico have been analysed and managed for many decades. Nevertheless our country suffers high rates of forest depletion. Why? Because although there is agreement regarding the proximate causes of forest depletion (agriculture, pasture, illegal tree destruction, etc.), disagreements arise regarding whether poverty, common property rights and inadequate public policies are the driving forces of forest depletion, and last but not least which policies should be designed and implemented to warrant an appropriate use of the resource. The following issues are analysed in the bibliography of environmental issues: national diagnosis of Mexican forests and vegetation; plagues; wildlife; timber-yielding and non timber-yielding products; natural/human perturbations and dynamics of ecological succession; forest depletion and its proximate causes (agriculture, cattle, urbanisation and demographic dynamics); reforestation, conservation and restoration; peasant management and use; collective management; modernisation and indigenous management; foreign investments; legal aspects and legislation, impacts of neo-liberal reforms; requirements of technological development.

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12 For instance, Mexico has 449 known species of mammals, 1,150 known species of birds, and 4,000 known species of fish, while Canada has 193, 514 and 1,066, and the USA has 466, 1,090 and 2,640 respectively. See OECD (1995, Table 6.1A).

13 According to the Ministry of Environment, Mexican forests were depleted at an average rate of at least 1.29 percent in the middle of the 1980s. SEMARNAP (1996c, Tables 11 and 3).

14 According to SEMARNAP (1996c, 17) rural communities own, in common property 80% of Mexican forests. Mexican forest policies have been biased to support agriculture rather than to maintain an adequate management of forests.
Science and technology

A very challenging discussion lies behind some of these documents. A number of scholars assess the neo-classical analysis of environmental issues, find it static and simple, and hence not adequate to understand the complexity and dynamism of environmental issues. They ask themselves whether it is possible to build new multidisciplinary theoretical tools to understand environmental phenomena. Other scholars find system theory tools useful for such a task, while still others realise that problems of understanding and communication prevail between the sciences of economy, ecology and other environmental disciplines. The bibliography of environmental issues comprises studies about: theoretical and normative perspectives of analysis and management of environmental issues; amplified monodisciplinary approaches (environmental economy, environmental sociology); inter-discipline and trans-discipline interrelations and new articulation of scientific disciplines to describe phenomena with various facets; systems theory and environmental sciences, chaos, self-organisation and environmental complexity; science-policy linkages, science-technology linkages; linkages among traditional agricultural knowledge and conventional (modern) agricultural technologies; environmental technologies for sustainable development.

Climate

In Mexico globally related climate studies have appeared only recently including investigations about the influence of global climate change on regional activities and resources. The studies of the bibliography analyse: regional climate; relations between regional climate change and agriculture; influence of global climate change on agriculture, fisheries, forests and other economic activities and natural resources; climatic forecasting and agriculture.

Consumption

This issue is marginal for Mexican specialists. The few studies of the bibliography assess the: impacts of domestic consumption on urban environments; structure and environmental impacts of domestic consumption of electricity.

Air pollution

Although air pollution in large Mexican cities is a subject of public concern, we have found relatively few works relating to it. They study: air quality in medium and large cities; transport systems and air contamination; linkages between air pollution and energetic resources.

Indigenous people

The attitudes of specialists and the Mexican population regarding indigenous people are ambivalent and controversial. On the one hand, in our schools, books, museums and investigations, we conceive – and sometimes idealise – indigenous people as the founders of Mexico, and as keepers of adequate strategies of management of natural resources. On the other hand, in our everyday life, we disdain them and see them as inferior beings. Historically, the Mexican elite have imposed their projects for the development of Mexico on the indigenous identity, values, sense of community and strategies of management of natural resources. Both ambivalence and controversial attitudes lie behind the publications of the bibliography, which study:

indigenous traditional techniques of management of natural resources; use of natural resources by prehispanic and present indigenous groups (nahuats, purepechas, mayas); culture and indigenous management of natural resources; gathering and indigenous strategies of survival; “nutritional environment” of indigenous people; indigenous concept of intellectual property; indigenous ecology, ethno-ecology; policies of territorial development in indigenous communities.

Environmental law

Environmental law has recently been developed in Mexico. The studies of the bibliography analyse: legal and institutional aspects of the environment and the management of natural resources; legislation of the Mexican oil industry, electric industry, biodiversity, and genetic resources; decentralisation of the Public Administration and legislation.

Development and environment

The following questions are analysed: eco-development, sustainable development; linkages between development and sustainability at the national and regional level, linkages between sustainable development and environmental economy; characteristics and linkages between development, social inequality and environment, and between Mexican structural change, economic crisis and the environment.¹⁶

Urbanisation

As mentioned in the introduction, specialists analyse and face the challenges posed by the “favela syndrome” of Mexico City, Monterrey, Guadalajara and other big cities, as well as of medium cities like Toluca, Ciudad Juárez, Puebla and Tijuana. Specialists analyse: macroeconomic dynamics of the cities; patterns of spatial distribution patterns of economic activities in urban areas; regional and extra-regional environmental impact of urbanisation; environmental feasibility of big cities; urban land use; territorial reserves; housing and environment; urban planning and economy; urban ecology; alternative technologies for urbanisation; Mexico City: environmental history; quality of life; linkages to rural surrounding areas; environmental scenarios; historical and present environmental conditions in other Mexican metropolitan or urban areas.

Environmental education

The bibliography of environmental issues includes: environmental manuals; introductory and training books about ecology, geo-hydrology and other environment related disciplines, as well as publications about Biotechnology and environmental training; environmental training of engineers; environmental training of bachelor students; culture and environmental training for children at primary school; the influence of scientific literature in environmental training.

¹⁶ Mexican structural change began in the 1980s. It refers to the transformation of the input substitution industrialisation and the “Mexican welfare state” by opening the economy to outside competition, deregulation of a wide array of markets and privatisation of public-sector assets. As a result, a new model has emerged, based on finances, trade and speculation, and characterised by the dynamism of some sectors of the economy (primarily export-oriented assembly and car industries, and farmers specialised in agro-business) and the continued economic crisis of the rest of the population (middle and small enterprises, informal urban employees, poorer small scale peasants).
Energy

The analysis and management of energy issues in Mexico is deeply influenced by the key role of oil in Mexican development. Oil is actually the main source of foreign currency for Mexico. The relative abundance of oil has led some academics, decision-makers and stakeholders to forget that it is an exhaustible resource, and its extraction has resulted in negative environmental and social impacts. It is therefore necessary, at least in terms of a medium range of a period of some 10 to 30 years, to look for and develop new, renewable and environmentally more friendly sources of energy. The publications of the bibliography refer to: Mexican national balance of energy, energetic scenarios, environmental challenges of Mexican energy system; energy-environment-development linkages; energy-environment-relative price linkages; historical and present regional environmental impact of the oil industry; non-renewable resources. Panorama of Mexican oil industry; Mexican oil boom in the 1970s; environmental regulation of the oil industry; oil and Mexican energy policies; national implications of recent changes in the international oil industry; Mexican electricity sector; summer-time, energy saving and costs.

Environmental ethics

The few works of the bibliography about this key environmental issue relate to: discussion and compilation of classical texts; description and analysis of the history, foundations, schools of thought (aesthetic, bio-centric, anthropocentric), and present tendencies of environmental ethics; analysis of the characteristics and linkages between ethics, philosophy and the environment.

US-Mexican border, international trade

Two questions are of concern for specialists working on these issues, and they have become increasingly important for Mexican decision-makers, academics and stakeholders since the 1980s. First, the characteristics and implications of globalisation and international trade for the Mexican economy, society and environment. Second, the water, air, hazardous wastes and other transboundary resource and pollution issues shared by Mexicans and US Americans along the border. The publications included in the bibliography refer to: water, air, hazardous wastes, the “favela syndrome” and other key transboundary environmental issues, driving forces environmental change along the border; responses of citizens and institutions; municipal perception and management; bi-national conflicts and cooperation; assembly industry (Maquiladora); occupational health of women in the assembly industry; environmental implications of the North American Free Trade Agreement (NAFTA), environmental impact of NAFTA in Mexican agriculture (tropical products, horticulture, floriculture and basic grains).

Gender

The few publications included in the bibliography refer to: gender and management of water, agriculture and handicraft; gender, domestic relations and management of forests.

Institutions

Specialists studying this issue have been influenced by the neo-institutionalist analysis of the management of common-pool problems (Ostrom) as well as by the reform of the public administration, which emerged in Mexico and other OECD countries during the 1990's, and “aimed at fostering a performance-orientated culture
in a less centralised public sector”. The introduction of the new paradigm developed an understanding of the priority given to issues such as strategic planning, decentralisation and self-management. The studies about institutions refer to: use and management of the common pool resources; management of biosphere reserves, and natural protected areas; institutional strengthening and water management; self-management of irrigation systems.

Social participation, environmental conflicts and co-operation

The few documents included in the bibliography refer to: new – environmental – social actors; social actors and sustainable development; social organisation and environmental regional struggles; linkages between state, environment and social movements; municipal management and social actors; NGOs, communities and eco-tourism; citizen participation in the construction and operation of dams; social organisation and small irrigation systems; urbanisation, social conflicts and environmental deterioration.

Fisheries

The few publications of the bibliography study: panorama of Mexican fishing resources; aquaculture and eco-development; technical bi-national co-operation among fishermen.

Poverty

Social inequality has increased during last two decades in Mexico. Labour income decreased by 50% during 1984-1999. Labour participation in the GNP was reduced from 30% to 24.6% during 1980-1990. Forty-two percent of the Mexican population earn less than two US dollars per day, and 17.9% earn less than one US dollar. Social segregation is related to striking environmental and social problems, such as the low quality of life for excluded sectors, soil and groundwater pollution related to lack of sanitation, and vulnerability to climatic disasters. Nevertheless, we found few studies in this field. They relate to the following issues: development, social inequality and the environment; poverty and management of natural resources; poverty and environmental deterioration.

Population

The publications of the bibliography analyse: Mexican demographic conditions and their social and environmental implications; population and sustainable development; linkages between water, population and environment, and between population, space and environment in Mexico City; migration and environmental change; agricultural modernisation and migration; demographic change and environmental perceptions.

Environmental policy

Specialists in environmental policy are influenced by international discussions about global environmental problems, international environmental regimes, and what are the more adequate environmental policy instruments. They are also driven by the history and recent transformations of the Mexican model of economic development, politics and policy. Different issues are analysed in Mexico, namely: the international environmental agenda; international responsibility; history of Mexican environmental

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17 OECD (1995, 8).
18 World Bank (2000, La Jornada Newspaper) and Márquez, D. (La Jornada Newspaper, 08/05/2000).
policy; causes of environmental management deficits; vision and schemes of environmental management; the role of NGOs; municipal management and civil society; political parties and environment; environmental governmental agenda; environmental management and democratic culture; environmental policy instruments (environmental impact assessment, economic instruments); environmental performance of target groups; articulation between environmental and social policies; comparative assessment of environmental management policies in Mexican and German cities; federalism and environmental management; legislation and municipal development; environmental management of metropolitan municipalities.

Common natural resources

The following issues are analysed: land propriety, use and conservation of natural resources; the problem (“tragedy”) of the commons; forest communal management; natural regions of Mexico and its states; biological and ecological diagnosis and analysis of Mexican ecosystems; biological resources.

Environmental risk, disasters and social vulnerability

Specialists in these issues, social and natural scientists, analyse: meteorological, anthropological and sociological proposals and methodologies for the analysis and forecasting of disasters; prevention of chemical disasters; history and present conditions of hurricanes, floods, droughts and other disasters; disasters and social vulnerability; vulnerability of Mexico City, and other Mexican cities and regions.

Health

The publications of the bibliography refer to: environmental health; human ecology and health; health impacts of the use of pesticides; health impacts of air pollution; urban sanitation and health, history and present conditions; irregular settlements, environmental conditions and children’s diseases; occupational health in the assembly industry.

Land use and soil management

Publications refer to: management, conservation and restoration of soils in arid and tropical areas; fertilisation, irrigation and soil depletion (salinity, acidification); environmental impact of mining; terrestrial vertebrates, vegetation and land use; agriculture, cattle and land use; rural and urban land use patterns; land propriety and land use.

Chemical substances

There are relative few specialists in chemical substances, although Mexico faces big challenges regarding their management. There is no reliable diagnosis of the amount of substances produced, transformed and discharged. According to calculations of 1996, 31,207,000 tonnes of municipal wastes is generated per year in Mexico. More than 60% of this amount is not adequately managed, i.e. is thrown in the open. Hence it is thought to pollute soil and water bodies. Around 8 million tonnes of hazardous wastes is generated annually in Mexico. Only 2.6% of this amount is land-filled while 0.4% is exported. The rest is assumed to pollute water bodies and soils.

20 OECD (1995, Table 7.3b).
The publications refer to: management of garbage and litter, history and present conditions; integral management of wastes; diagnosis of Mexican hazardous wastes; technologies for the management of hazardous wastes; municipal management of hazardous wastes; pesticides in Mexico, legislation and management; impacts of pollution by mercury and other hazardous substances; hazardous wastes of mining; modelling of subsoil leaching of deposited hazardous substances.

**Industrial transformation**

Few publications on industrial transformation analyse “the relationship between societal, technological, and environmental change”, or try to relate producer and consumer perspectives”. The bibliography of environmental issues includes publications about: assessment of the environmental impact of Mexican industry; clean industries; industrial corridors and basins; environmental industrial performance; history of the mining industry; assessment of the environmental impact of the mining industry; industrial contamination in Mexico City; relationships between environmental and occupational regulations and industrial competitiveness; occupational environmental conditions.

**Tourism**

The few publications of the bibliography relate to: environmental impacts of tourist development; regulation of tourist activities in reserve and nature conservation areas.

**Wildlife**

Specialists in wildlife, most of whom are biologists and ecologists, make: inventories of Mexican flora and fauna (cactus, birds, molluscs, amphibians, reptiles, mammals); conduct projects of diagnosis, conservation and management of endangered, rare and endemic species; make an inventory of Mexican medicinal plants; assess the impact of thermal emissions in marine phytoplankton.

**Arid zones**

The publications analyse: the use and overexploitation of natural resources; development projects water management.

**Coastal and marine zones**

The works on this issue refer to: diagnosis and conservation of marine and coastal ecosystems and resources; ecology of coastal zones; participatory management of coastal and marine areas; pollution of the Gulf of Mexico and environmental impact.

**Table 1. Key Issues and Documents regarding Human Dimensions of Environmental Change**

<table>
<thead>
<tr>
<th>Issue / Kind of document</th>
<th>Books</th>
<th>Proceedings</th>
<th>Articles in scientific reviews</th>
<th>Chapters in books</th>
<th>Working papers</th>
<th>Programmes, Planning</th>
<th>Other Documents</th>
</tr>
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<tr>
<td>Agriculture</td>
<td>49</td>
<td>7</td>
<td>15</td>
<td>15</td>
<td>1</td>
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<tr>
<td>Air pollution</td>
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<td>-</td>
<td>2</td>
<td>-</td>
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</tr>
</tbody>
</table>

21 IHDP/IT (1999, xi). Mexican specialists have focused on systems and system changes that are relevant in view of the global environment (such as energy system, the food system and the urban system) IHDP/IT (1999, xi).
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<td>Attitudes</td>
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<td>Biodiversity</td>
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<td>10</td>
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<tr>
<td>Chemical substances</td>
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<td>Climate</td>
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<td>2</td>
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<td>Development, environment</td>
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<td>Total</td>
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* Various documents appear in more than one item. Therefore the totals do not correspond with the absolute amount of documents of the bibliography.
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4. Inventory of Mexican specialists working on human dimensions of environmental change

This chapter comprises two inventories of specialists working on human dimensions of environmental change. The first one includes the information sent to us by around 50 specialists (Table 3). The second one was built by us, based on the directories of LEAD-Mexico and the National Network of Water Researchers, on the information of the authors and papers related bibliography, and on our personal contacts, analysis and retrieval (Table 4).

Sixty percent of specialists in human dimensions included in the inventory belong to the academic sector, while the smallest proportion (8%) works in the private sector (Table 3). We included specialists of different working sectors in the inventory (private, academic, governmental, and social i.e. national and international non-governmental organisations). We decided to do so, because a lot of Mexican specialists who have made huge contributions to the analysis and management of the human dimensions of environmental change do work in other sectors than the academic. Julia Carabias, at the present Ministry of Environment (SEMARNAP) is a remarkable example of such a phenomenon.

Table 2. Working Sector of the Specialists in Human Dimensions

<table>
<thead>
<tr>
<th>Working sector</th>
<th>Data of Table 3*</th>
<th>%</th>
<th>Data of Table 4 of %</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic</td>
<td>31</td>
<td>62</td>
<td>119</td>
<td>59</td>
<td>150</td>
</tr>
<tr>
<td>Governmental</td>
<td>10</td>
<td>20</td>
<td>35</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Non governmental organization</td>
<td>7</td>
<td>14</td>
<td>28</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td>Private</td>
<td>2</td>
<td>4</td>
<td>18</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
<td>200</td>
<td>100</td>
<td>250</td>
</tr>
</tbody>
</table>

* One of the 249 persons included in this table works in both the private sector and a non-governmental organization
<table>
<thead>
<tr>
<th>Name, institution, e-mail and sector</th>
<th>Projects in the areas of</th>
<th>Results</th>
</tr>
</thead>
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<tr>
<td>- Aboites Aguilar, Luis</td>
<td>- Governmental</td>
<td>- Three chapters in books and two books about disasters and history of water uses and management in Mexico</td>
</tr>
<tr>
<td>- The College of Mexico (COLMEX)</td>
<td>management and history</td>
<td></td>
</tr>
<tr>
<td>- <a href="mailto:laboites@colmex.mx">laboites@colmex.mx</a></td>
<td>of water, disasters and</td>
<td></td>
</tr>
<tr>
<td>- Academic</td>
<td>water</td>
<td></td>
</tr>
<tr>
<td>- Arellano Guillermo, Alfredo</td>
<td>- Biodiversity planning</td>
<td>- Design of 5 programs of regional management, tourism, ecological regulation, management of parks and ecological reserves</td>
</tr>
<tr>
<td>- National Institute of Ecology (INE), Ministry of Environment, Natural Resources and Fishery (SEMARNAP)</td>
<td>and management, and use, attitudes and behaviour, environmental education, ecological regulation</td>
<td>- Diagnosis and decree of one protection area of flora and fauna and of one biosphere reserve</td>
</tr>
<tr>
<td>- <a href="mailto:siankaan@prodigy.netmx">siankaan@prodigy.netmx</a></td>
<td>- Water, poverty, public</td>
<td>- Design of “marketable development permits” for Quintana Roo</td>
</tr>
<tr>
<td>- Governmental</td>
<td>management of water</td>
<td></td>
</tr>
<tr>
<td>- <a href="mailto:Pavila@lead.colmex.mx">Pavila@lead.colmex.mx</a></td>
<td>basins, attitudes/perceptions/behaviour, indigenous people and the environment, science/technology linkages, regional development, urbanisation</td>
<td>- Regulation of the Mexican Environmental Law (LGEEPA) for Protected Natural Areas</td>
</tr>
<tr>
<td>- <a href="mailto:Pavila@jupiter.ccu.umich.mx">Pavila@jupiter.ccu.umich.mx</a></td>
<td>- Different books” and pilot programs about regional SD in the Mexican states of Michoacán, Oaxaca and Guerrero</td>
<td></td>
</tr>
<tr>
<td>- <a href="mailto:Pavila@jupiter.ccu.umich.mx">Pavila@jupiter.ccu.umich.mx</a></td>
<td>- Water quality, water</td>
<td>- Participation in the Project Patzcuaro 2000, pilot program of development (UNPE)</td>
</tr>
<tr>
<td>- <a href="mailto:Pavila@jupiter.ccu.umich.mx">Pavila@jupiter.ccu.umich.mx</a></td>
<td>public management of water basins, attitudes/perceptions/behaviour, indigenous people and the environment, science/technology linkages, regional development, urbanisation</td>
<td>- Various reports regarding technology assessments of efficiency in the use water and firewood. Program for the dev.of appropriate technologies</td>
</tr>
<tr>
<td>- Barkin, David</td>
<td>- Regional development, indigenous sustainable management of regional resources, wealth, poverty and sustainable development, water basins</td>
<td>- Two books, four articles in scientific magazines and one chapter in a book regarding basins, regional dev., rural development, wealth, poverty and SD and water production</td>
</tr>
<tr>
<td>- Metropolitan Autonomous University, (UAM) Campus Xochimilco</td>
<td>- Water quality, water</td>
<td>- Three articles in scientific magazines, three articles for congress proceedings about monitoring and diagnosis of water quality</td>
</tr>
<tr>
<td>- <a href="mailto:barkin@cueyatlu.am.mx">barkin@cueyatlu.am.mx</a></td>
<td>public management, water/technical, institutional and social aspects linkages</td>
<td></td>
</tr>
<tr>
<td>- Academic</td>
<td>- Biodiversity, forests, social participation, strategic planning for SD, in-stitutions, coastal zones, urbanisation, agriculture, protected natural areas</td>
<td>- 4 working papers, 4 chapters in books and various documents about mgt of hydrol. basins, national parks, a boil. corridor, coral reef systems, biodiversity, social participation in Quintana Roo</td>
</tr>
<tr>
<td>- Barrios Ordoñez, Eugenio,</td>
<td>- Water quality, water</td>
<td></td>
</tr>
<tr>
<td>- Institute of Engineering, National Autonomous University of Mexico (UNAM)</td>
<td>public management, water/technical, institutional and social aspects linkages</td>
<td></td>
</tr>
<tr>
<td>- <a href="mailto:jbao@pumas.ingen.unam.mx">jbao@pumas.ingen.unam.mx</a></td>
<td>- Biodiversity, forests, social participation, strategic planning for SD, in-stitutions, coastal zones, urbanisation, agriculture, protected natural areas</td>
<td></td>
</tr>
<tr>
<td>- Academic</td>
<td>- Divers, forests, social participation, strategic planning for SD, in-stitutions, coastal zones, urbanisation, agriculture, protected natural areas</td>
<td>- 4 working papers, 4 chapters in books and various documents about mgt of hydrol. basins, national parks, a boil. corridor, coral reef systems, biodiversity, social participation in Quintana Roo</td>
</tr>
<tr>
<td>- Bezaury Creel, Juan</td>
<td>- Biodiversity, forests, social participation, strategic planning for SD, in-stitutions, coastal zones, urbanisation, agriculture, protected natural areas</td>
<td>- 4 working papers, 4 chapters in books and various documents about mgt of hydrol. basins, national parks, a boil. corridor, coral reef systems, biodiversity, social participation in Quintana Roo</td>
</tr>
<tr>
<td>- The Nature Conservancy, Division Mexico</td>
<td>- Biodiversity, forests, social participation, strategic planning for SD, in-stitutions, coastal zones, urbanisation, agriculture, protected natural areas</td>
<td>- 4 working papers, 4 chapters in books and various documents about mgt of hydrol. basins, national parks, a boil. corridor, coral reef systems, biodiversity, social participation in Quintana Roo</td>
</tr>
<tr>
<td>- <a href="mailto:jbezaury@tnc.org">jbezaury@tnc.org</a></td>
<td>- Academic</td>
<td></td>
</tr>
<tr>
<td>- International non Governmental Organization</td>
<td>- Biodiversity, forests, social participation, strategic planning for SD, in-stitutions, coastal zones, urbanisation, agriculture, protected natural areas</td>
<td>- 4 working papers, 4 chapters in books and various documents about mgt of hydrol. basins, national parks, a boil. corridor, coral reef systems, biodiversity, social participation in Quintana Roo</td>
</tr>
</tbody>
</table>

Table 3. Inventory of specialists working on human dimensions of environmental change
<table>
<thead>
<tr>
<th>Name, Institution, e-mail and sector</th>
<th>Projects in the areas of</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Boehm of Lameiras, Brigitte</td>
<td>- Water: history, culture and public management</td>
<td>- Three articles in scientific magazines, various articles in newspapers about water: history, culture and public management</td>
</tr>
<tr>
<td>- The College of Michoacán, <a href="mailto:bboehm@colmich.edu.mx">bboehm@colmich.edu.mx</a>, Academic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Calvillo Unna, Alejandro</td>
<td>- Climate, human security, management of soils, industrial transformation, health, urbanisation, environmental risk, science/technology linkages, nuclear energy, coastal zones and social participation</td>
<td>- Co-ordinator of the public campaign, which let stop the project for the nuclear dump Sierra Blanca, USA-Mexico border</td>
</tr>
<tr>
<td>- Greenpeace, Mexico, <a href="mailto:alejandro.calvillo@dialb.greenpeace.org">alejandro.calvillo@dialb.greenpeace.org</a></td>
<td></td>
<td>- Monitoring and report about air pollution in Mexico-City. The report comprised information about benzene and TSP as well as the typical pollutants ((O_3), (CO_2), (NO_x), and (SO_3)).</td>
</tr>
<tr>
<td>- International non Governmental Organisation</td>
<td></td>
<td>- Report about irregularities in the Mexican nuclear plant “Laguna Verde”, press campaigns and lobbying against this plant in the chambers of deputies and senators</td>
</tr>
<tr>
<td>- Cervera Montejano, María Dolores</td>
<td>- Health, nourishment, behaviour of mother/babies and children under 5 years old regarding environment, application of results to the design, implementation and evaluation of community intervention programs</td>
<td>- Co-author of four articles in books about epidemiology and modernity, nutrition, motherhood and gender and epidemic panorama of the Mexican state of Yucatán</td>
</tr>
<tr>
<td>- Polytechnic National Institute <a href="mailto:mdcervera@prodigy.netmx">mdcervera@prodigy.netmx</a> <a href="mailto:lola@mda.cinvestav.mx">lola@mda.cinvestav.mx</a> Academic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Conde Alvarez, Ana Cecilia</td>
<td>- Climate change, agriculture and water resources</td>
<td>- Since 1997, participation in five international and national projects, three chapters in books and two articles in scientific magazines about climate change, its forecasting and its relation to agriculture and water resources</td>
</tr>
<tr>
<td>- Centre of Atmospheric Sciences, UNAM <a href="mailto:conde@servidor.unam.mx">conde@servidor.unam.mx</a> Academic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Cortez Ruiz, Carlos</td>
<td>- Biodiversity, forests, population, poverty, indigenous people, attitudes/perception/behaviour, social participation, strategic planning, agriculture, and human sustainable development</td>
<td>- Various reports about human and intercultural development, participatory regional diagnosis, proposals for the creation of units of sustainable management of wildlife, flora and agro-ecology by the communities, working papers for the communal qualification, and Program of Regional Sustainable Development for the Biosphere Reserve “Mariposa Monarca”</td>
</tr>
<tr>
<td>- Metropolitan Autonomous University, Campus Xochimilco <a href="mailto:corc4411@cueytal.uam.mx">corc4411@cueytal.uam.mx</a> Academic</td>
<td></td>
<td>- “Diplomado” in Human SD</td>
</tr>
<tr>
<td>Name, institution, e-mail and sector</td>
<td>Projects in the areas of</td>
<td>Results</td>
</tr>
<tr>
<td>-------------------------------------</td>
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<td>---------</td>
</tr>
<tr>
<td>- Chapela y Mendoza, Gonzalo</td>
<td>- Forests, management of soils, attitudes/perceptions/behaviour, strategic planning, institutions, desertification, agriculture, and cattle</td>
<td>- Two projects (harmonising public policies and natural resources in Latin America and against Desertification), four programs (Environmental of DF, Forest and Soils for the Federation, Social Enterprises for the Protection of the Fo-rests, DF, and Sustainable Development, “Monarca” Butterfly, Michoacán), preliminary assessment of the public policies and the rural sustainable development in Mexico, proposals for the improvement of technical forest services in Mexico</td>
</tr>
<tr>
<td>- Co-ordination Unity of the Program against the Desertification in Latin America and the Caribbean - <a href="mailto:gchapela@laneta.apc.org">gchapela@laneta.apc.org</a> - International non Governmental Organization</td>
<td>- Forests, management of soils, attitudes/perceptions/behaviour, strategic planning, institutions, desertification, agriculture, and cattle</td>
<td>- Two projects (harmonising public policies and natural resources in Latin America and against Desertification), four programs (Environmental of DF, Forest and Soils for the Federation, Social Enterprises for the Protection of the Fo-rests, DF, and Sustainable Development, “Monarca” Butterfly, Michoacán), preliminary assessment of the public policies and the rural sustainable development in Mexico, proposals for the improvement of technical forest services in Mexico</td>
</tr>
<tr>
<td>- Delgado Peralta, Martha</td>
<td>- attitudes/perception/behaviour, climate, health, human security, social participation, institutions, environmental information and education, natural protected areas</td>
<td>- One manual about information on pollutants, 14 reports about request of env. information for the government, and 3 workshops about environmental information in 3 Mexican cities - Citizen actions (organisation, mobilisation and critique) against proj. regarding climate change</td>
</tr>
<tr>
<td>- Union of Environmental Groups Mexican Citizen Presence - <a href="mailto:presenci@prodigy.netmx">presenci@prodigy.netmx</a> - National non Governmental Organization</td>
<td>- Forests, health, water, public management, human security, management of soils, industrial transformation, environmental risk, social participation, strategic planning, institutions, coastal zones, desertification, urbanisation and agriculture</td>
<td>- Participation in 40 environmental national programs, 30 state agendas (each one with 10 projects of co-operation among the three government levels), 14 projects of rehabilitation of water basins, 18 projects of management of national Natural Protected Areas, 7 projects of fisheries regulation, and 5 projects of reforestation and management of soils, 8 (urban) local 21 agendas, 20 Official Mexican Standards (NOM,s) for Env.Water Quality and Water Discharge/Treatment, 5 interdisciplinary specialisation courses</td>
</tr>
<tr>
<td>- Duffing, Eike - SEMARNAP - <a href="mailto:duffing@semarnap.gob.mx">duffing@semarnap.gob.mx</a> - Governmental</td>
<td>- Forests, health, water, public management, human security, management of soils, industrial transformation, environmental risk, social participation, strategic planning, institutions, coastal zones, desertification, urbanisation and agriculture</td>
<td>- Participation in 40 environmental national programs, 30 state agendas (each one with 10 projects of co-operation among the three government levels), 14 projects of rehabilitation of water basins, 18 projects of management of national Natural Protected Areas, 7 projects of fisheries regulation, and 5 projects of reforestation and management of soils, 8 (urban) local 21 agendas, 20 Official Mexican Standards (NOM,s) for Env.Water Quality and Water Discharge/Treatment, 5 interdisciplinary specialisation courses</td>
</tr>
<tr>
<td>- García Acosta, Virginia</td>
<td>- Disasters: history, social response, economic and social impacts, sociological analysis</td>
<td>- Co-ordinator of 4 books, co-author of one, 10 book chapters, 8 articles in sci. mag., 1 chapter in seminars proc., 2 doc., as well as 2 books, 2 articles and 3 chapters in press about disasters (history, social resp., econ. and social impacts, social. analysis)</td>
</tr>
<tr>
<td>- Centre of Research and High Studies in Social Anthropology, CIESAS - <a href="mailto:vgarciaa@juarez.ciesas.edu.mx">vgarciaa@juarez.ciesas.edu.mx</a> - Academic</td>
<td>- Disasters: history, social response, economic and social impacts, sociological analysis</td>
<td>- Co-ordinator of 4 books, co-author of one, 10 book chapters, 8 articles in sci. mag., 1 chapter in seminars proc., 2 doc., as well as 2 books, 2 articles and 3 chapters in press about disasters (history, social resp., econ. and social impacts, social. analysis)</td>
</tr>
<tr>
<td>Name, institution, e-mail and sector</td>
<td>Projects in the areas of</td>
<td>Results</td>
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<tr>
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</tbody>
</table>
| - Graizbord, Boris  
  - The College of Mexico,  
  - graizbord.lead.colmex.mx,  
  - Academic | - Urbanisation, population, public management, transport, economic and demographic state scenarios | - Two books about medium-sized cities and urban policies, 2 books about housing and human ecology in Mexico-City, works about transport and pollution in Mexico-City, assessment of economic and demographic scenarios in Guanajuato, and 2 state plans of urban development. |
| - Hernández Fernández, Claudia  
  - University Program of Environment, UNAM  
  - merengue@servidor.unam.mx  
  - Academic | - Attitudes/perception/behaviour, environmental education, social participation, strategic planning, institutions and domestic wastes | - Two books and 5 working papers about management of domestic wastes and environmental education. - Various courses about environmental education, environmental education, management of forests, environmental education, environmental education, environmental education. |
| - Herrera Ascencio, Patricia  
  - Mexican Institute of Water Technology  
  - pherrera@chac.imta.mx  
  - Governmental | - Water and strategic planning | - Various chapters for conferences about shared international waters, and two reports (technical prospecting of water resources for 2000 and technical international co-operation). |
| - Izazola, Haydea  
  - Metropolitan Autonomous University, Campus Xochimilco  
  - hizazola@cueyatl.uam.mx  
  - Academic | - Population, migration, quality of life and sustainability, water and sustainability in Mexico-City | - Five chapters in books, 2 articles in scientific magazines, and a compilation of 3 books about population, migration, water, quality of life and sustainability. |
| - Jiménez Cisneros, Blanca Elena  
  - Institute of Engineering, UNAM  
  - bjc@pumas.ingen.unam.mx  
  - Academic | - Water, health, management of soils | - More than 70 international publications about design and operation of water treatment systems. - Studies that have supported the design of the Mexican Official Norms about water analysis. - Development of various technical water treatment adapted to Mexico and other underdeveloped countries. |
| - Lazos Chavero, Elena  
  - Institute of Social Research, UNAM  
  - lazos@servidor.unam  
  - Academic | Attitudes/perception/behaviour, LUCC, social participation, agriculture, cattle, institutions and management of natural resources, population | - Co-author of 2 chapters in books, author of 4 chapters in books and of 1 book about indigenous people, institutions, management of natural resources, perceptions and culture. |
| - León Diez, Cuauhtémoc  
  - El College of Mexico A.C.  
  - cleon@lead.colmex.mx  
<table>
<thead>
<tr>
<th>Name, institution, e-mail and sector</th>
<th>Projects in the areas of</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesser Hiriart, Héctor - ICF Kaiser Environmental Services, S.A. of C.V. - <a href="mailto:kaiser1@df1.telmex.netmx">kaiser1@df1.telmex.netmx</a> - Private</td>
<td>- Biodiversity, forests, water, public management, fisheries, management of soils, coastal zones, air pollution, environmental auditing, environmental impact assessment, management of domestic and hazardous wastes</td>
<td>- More than 70 env. audits, more than 50 env. impact assessments - Advising env. authorities in Panama regarding the implementation of the Master Environmental Plan (env. policy of Panama) as well as waste waters treatment and reuse in industrial and ag. activities - Advising metal mechanic industries regarding diagnosis of soil pollution by hydrocarbon and cleaning/repairing strategies</td>
</tr>
<tr>
<td>Luzuriaga Cisneros, Carlos - Anáhuac University, D.F., - Tech. Inst. of High Studies of Monterrey, Toluca, Estate of Mexico, - <a href="mailto:consulcr@df1.telmex.netmx">consulcr@df1.telmex.netmx</a> - Academic</td>
<td>- Economy, environmental information, public management, forests, and use, rural waters suppand systems, rural development</td>
<td>- Ten books and various articles about economy, environmental impact, gender, rural development, human settlement, and management of forests and soils in Ecuador</td>
</tr>
<tr>
<td>Maganda, Carmen - Centre of Research and High Studies in Social Anthropology, - <a href="mailto:magya@juarez.ciesas.edu.mx">magya@juarez.ciesas.edu.mx</a>, - Academic</td>
<td>- Water management, territorial planning, risk, social vulnerability</td>
<td>- Ph.D. thesis in process</td>
</tr>
<tr>
<td>Martínez Arroyo, Amparo - Laboratory of Eco-physiology, Centre of Atmospheric Sciences, UNAM - <a href="mailto:marroyo@servidor.unam.mx">marroyo@servidor.unam.mx</a> - Academic</td>
<td>- Climate, water, environmental risk, coastal zones, urbanisation, environmental education</td>
<td>- Four articles in sci. magazines, 3 chapters in books and 2 articles in newspapers about coastal zones, biodiversity, energy, ecology and public policies</td>
</tr>
<tr>
<td>Mejía Ponce de León, Adolfo - National Polytechnic Institute - <a href="mailto:mejia.montero@infosel.netmx">mejia.montero@infosel.netmx</a> - Academic</td>
<td>- Public management, history, local government and municipalities, environmental training of engineers</td>
<td>- Two books about ecology and structural change in Chiapas and municipal management in Naucal-pan, State of Mexico, 2 articles in sci. magazines about boil. communities , and twelve outreach articles about env. training and legislation, 7 articles in reports about env. training of engineers and juridical frame of env. management</td>
</tr>
<tr>
<td>Melville, Roberto - Centre of Research and High Studies in Social Anthropology, CIESAS - <a href="mailto:melville@juarez.ciesas.edu.mx">melville@juarez.ciesas.edu.mx</a> - Academic</td>
<td>- Water, population, science/technology linkages, urbanisation, agriculture</td>
<td>- Five chapters in books, one article of sci. magazines, one book and one working paper about hydraulic systems, irrigation systems, hydrol. basins and planning - Co-editor of 10 about irrigation, water engineers, water use and other water-related issues</td>
</tr>
<tr>
<td>Name, institution, e-mail and sector</td>
<td>Projects in the areas of</td>
<td>Results</td>
</tr>
<tr>
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</tr>
<tr>
<td>- Mendoza, Guillermo</td>
<td>- Agriculture and water management in semiarid areas</td>
<td>Ph.D. thesis in process</td>
</tr>
<tr>
<td>- Cornell University, <a href="mailto:gfm1@cornell.edu">gfm1@cornell.edu</a>, - Academic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Monsalvo Velázquez, Ma. Guadalupe - International Institute of Water Management, <a href="mailto:yolo2000@yahoo.com">yolo2000@yahoo.com</a> - International NGO</td>
<td>- Water, gender, irrigation societies, and “institutional sustainability”</td>
<td>- One working paper about “institutional sustainability” in irrigation societies in Mexico</td>
</tr>
<tr>
<td>- Montes Contreras, Luisa - Ministry of Environment, Natural Resources and Fishery (SEMARNAP), <a href="mailto:lmontes@semarnap.gob.mx">lmontes@semarnap.gob.mx</a> - Governmental</td>
<td>- Biodiversity, forests, water, social participation, strategic planning, economic instruments and environmental financing, garbage and environmental efficiency</td>
<td>- Design of economic instruments for the Mexican Environmental Law (LGEEPA) and the Regulation of Natural Protected Areas - Creation of Ecobanca, a non profit public and private org. specialized in env. financing</td>
</tr>
<tr>
<td>- Murillo Licea, Daniel - Mexican Institute of Water Technology, <a href="mailto:dmurillo@cenca.imta.mx">dmurillo@cenca.imta.mx</a> - Governmental</td>
<td>- Water, communication and training, environmental tools aimed at managing irrigation systems</td>
<td>- Working reports, communication systems and training unity aimed at supporting the transference of irrigation systems - Participation in the editing of 11 books about water history and anthrop., various tech. articles about communication (in press), and one article about oral history for the assess. of communication actions in humid tropical areas - Graphic media campaign addressed to peasants and children</td>
</tr>
<tr>
<td>- Navarrete Hernández, María Alejandra - SEMARNAP, <a href="mailto:anavarrete@semarnap.gob.mx">anavarrete@semarnap.gob.mx</a>, - Governmental</td>
<td>- Environmental legislation, natural resources, biodiversity, genetic resources and protected natural areas</td>
<td>- Four articles about environmental legislation, deforestation, de-centralization, electricity and biodiversity</td>
</tr>
<tr>
<td>- Ortíz Espejel, Benjamín - Interdisciplinary Program in Sustainable Development and Environment, UIAGC, <a href="mailto:biosuel@sun.ieco.conacyt.mx">biosuel@sun.ieco.conacyt.mx</a> - Academic</td>
<td>- Forests, management of soils, biodiversity, indigenous people, agriculture, poverty, public management, social participation, strategic planning</td>
<td>- Five projects about deforestation assessment, boil. fertility of the soils, indigenous communal management of natural resources, tropical sust. cattle, and state SD - Two programs about indigenous agro-ecology</td>
</tr>
<tr>
<td>- Palerm Viqueira, Jacinta - College of Postgraduates, <a href="mailto:jpalerm@colpos.colpos.mx">jpalerm@colpos.colpos.mx</a> - Academic</td>
<td>- Water, self-organization and management of irrigation systems</td>
<td>- Editor of two books and author of 7 chapter in books as well as of one article in a congress report about water, self-administrated organization and governmental management of irrigation systems</td>
</tr>
<tr>
<td>Name, institution, e-mail and sector</td>
<td>Projects in the areas of</td>
<td>Results</td>
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<tr>
<td>-------------------------------------</td>
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</tr>
<tr>
<td>Peña de Paz, Francisco, El College of San Luis, A. C - <a href="mailto:frape@colsan.edu.mx">frape@colsan.edu.mx</a> - Academic</td>
<td>Water, poverty, forests, environmental risk, agriculture</td>
<td>Editor and co-author of 2 books, 1 article in scientific magazine and 2 chapters in books about the ethnographic dimension and the limits of agricultural irrigation with sewage waters, gender, development and indigenous people, and agriculture, population and deterioration of natural resources</td>
</tr>
<tr>
<td>Pérez Gil Salcido, Ramón - Faunam / PG7Advisers, <a href="mailto:perezgil@laneta.apc.org">perezgil@laneta.apc.org</a> - Private, Non government organization</td>
<td>Natural protected areas, wildlife, ecology and conservation of natural resources</td>
<td>Six studies and different actions of advising, technical attendance and training in the areas of management of natural resources, natural protected areas and wild fauna</td>
</tr>
<tr>
<td>Rodríguez H., María del Carmen - University Program of Environment, UNAM - <a href="mailto:mcrodri@servidor.unam.mx">mcrodri@servidor.unam.mx</a> - Academic</td>
<td>Climate change, biodiversity, public management, indigenous people, urbanisation</td>
<td>Author of one book and co-author of 2 books about climate change, notes of environmental interest environment in Mexico city</td>
</tr>
<tr>
<td>Robinson, Scott S. - UAM – Campus Iztapalapa - <a href="mailto:ssr@laneta.apc.org">ssr@laneta.apc.org</a> - Academic</td>
<td>Communication and information, UAM-TV centre, citizens and municipal management</td>
<td>Project in process</td>
</tr>
<tr>
<td>Romero Lankao, Patricia - Metropolitan Autonomous University – Campus Xochimilco - <a href="mailto:rolp7543@cuayatl.uam.mx">rolp7543@cuayatl.uam.mx</a> - Academic</td>
<td>Water, environmental policies, industrial transformation, agriculture, attitudes/perception/behaviour, science/policy linkages, institutions, urbanisation</td>
<td>Four books, 8 chapters in edited volumes, and 8 articles in scientific magazines (Mexico, Latin America, USA and Europe) about public management and uses of water in Mexico and its capital, design of Mexican industrial and agricultural environmental policy, attitudes/perception/behaviour of target-groups, and science/policies linkages</td>
</tr>
<tr>
<td>Ruge, Tiahoga - North American Centre of Environmental Information and Communication, CICEANA, <a href="mailto:jdiaz@correo.ciceana.org.mx">jdiaz@correo.ciceana.org.mx</a> - International non Governmental Organization</td>
<td>Environmental information</td>
<td>National System of environmental information</td>
</tr>
<tr>
<td>Sánchez Izquierdo, Marco Antonio - Mexican Institute of Water Tech, <a href="mailto:msanchez@cenca.imta.mx">msanchez@cenca.imta.mx</a> - Governmental</td>
<td>Water, science/tech. linkages, management of soils, social participation, desertification, ag., hydrol. basins</td>
<td>Master thesis in process about underground water impact of agriculture modernization</td>
</tr>
<tr>
<td>Name, institution, e-mail and sector</td>
<td>Projects in the areas of</td>
<td>Results</td>
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<tr>
<td>-------------------------------------</td>
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</tr>
<tr>
<td>Sánchez, Roberto</td>
<td>Climate, health, water, population, poverty, public management, human security, industrial transformation, social participation, strategic planning, institutions, urbanisation</td>
<td>Co-author and author 26 articles in scientific magazines, 18 chapters in books, one article seminar report, 11 research reports and one book about climate, health, water, population, poverty, public management, human security, industrial transformation, social participation, strategic planning, institutions, and urbanisation</td>
</tr>
<tr>
<td>Environmental Studies, UCSC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><a href="mailto:rsanchez@cats.ucsc.edu">rsanchez@cats.ucsc.edu</a></td>
<td></td>
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<tr>
<td>Academic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandoval Minero, Ricardo</td>
<td>Water, social participation, strategic planning and institutions</td>
<td>Participation in 9 reports about different environmental issues - One report, 7 chapters in seminar reports and 3 articles in scientific magazines about development, water, strategic planning, and social participation</td>
</tr>
<tr>
<td>Estate Commission of Water and Sanitation of Guanajuato</td>
<td></td>
<td></td>
</tr>
<tr>
<td><a href="mailto:rsyova@guanajuato.gob.mx">rsyova@guanajuato.gob.mx</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governmental</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valdovinos Terán, Miguel Angel</td>
<td>Nuclear energy, public management, environmental risk, coastal zones, air pollution, management of hazardous wastes</td>
<td>Four reports about nuclear security, Strengthening of state and municipal env. management in 11 Mexican states, and one project of reuse of water in 4 gas distribution enterprises - An environmental impact assessment of the nuclear plant Laguna Verde. - Diagnosis and restoration of sub-soils polluted by hydrocarbons in Guadalajara.</td>
</tr>
<tr>
<td>University Program of Environment, UNAM</td>
<td></td>
<td></td>
</tr>
<tr>
<td><a href="mailto:materan@servidor.unam.mx">materan@servidor.unam.mx</a></td>
<td></td>
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<tr>
<td>Academic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vargas Velázquez, Sergio</td>
<td>Water, social participation, indigenous people, coastal zones attitudes/perception/behaviour, institutions, agriculture</td>
<td>Three articles, one manual (assessment of small irrigation projects), and one book (in press) about water, social participation, indigenous people, coastal zones attitudes/perception/behaviour, institutions, and agriculture</td>
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<tr>
<td>Institute Mexican of Water Technology</td>
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<tr>
<td>Varis, Olli</td>
<td>Water, nourishment, poverty, urbanization</td>
<td>Around 60 scientific publications in international sessions, recognized by United Nations and international research and acad. institutions of Mexico and around the world</td>
</tr>
<tr>
<td>Helsinki Polytechnic University, Finandia</td>
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<tr>
<td><a href="mailto:olli.varis@hut.fi">olli.varis@hut.fi</a></td>
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<tr>
<td>Vega López, Eduardo</td>
<td>Climate, public management, water, biodiversity, forests, industrial transformation, strategic planning, institutions, coastal zones, urbanization</td>
<td>Co-author of 3 books about environmental economy, economic instruments and “biodiversity economy” - Co-editor of one book about econ. assessment of biodiversity - Various articles in newspapers</td>
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<tr>
<td>Ministry of Environment of the Federal District Governmental</td>
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<tr>
<td><a href="mailto:evega@lead.colmex.mx">evega@lead.colmex.mx</a></td>
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### Table 4. Inventory of specialists working on human dimensions of environmental change

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<th>Name, institution, e-mail and sector</th>
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<th>Results</th>
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<tbody>
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<td>- Velázquez Gutiérrez, Margarita</td>
<td>- Forests, poverty, indigenous people, social participation, attitudes/perception/behaviour, agriculture, gender</td>
<td>- Co-author of one book about culture, global change, perceptions and deforestation in the Lacandona rain forest - Editor of one book about gender and environment</td>
</tr>
<tr>
<td>- Regional Centre of Multidisciplinary Research, UNAM, <a href="mailto:mavg@servidor.unam.mx">mavg@servidor.unam.mx</a> - Academic</td>
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<tr>
<td>- Adame N., Alfonso (S. I.)</td>
<td>- Water and agriculture</td>
<td>- One book about water and agriculture</td>
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<tr>
<td>- Adamo Flament, Susana Beatriz - (S. I.)</td>
<td>- Water and irrigation agriculture</td>
<td>- One book about water and environment in an irrigation system</td>
</tr>
<tr>
<td>- Aguilar, Yasmine - Group of Environmental Studies GEA - <a href="mailto:geapasos@laneta.apc.org">geapasos@laneta.apc.org</a> - Non governmental organization, National</td>
<td>- Rural Development, agriculture and management of natural resources</td>
<td>- Co-ordinator of a program about use of natural resources - Different articles in scientific magazines and chapters in books about rural sustainable development</td>
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<td>- Aguilara H., Nicolás (N.D.)</td>
<td>- Soils</td>
<td>- One book about soils in Mexico</td>
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<tr>
<td>- Aguilar H. Herrera N. (N.D.)</td>
<td>- Forests</td>
<td>- One book about forests in Mexico</td>
</tr>
<tr>
<td>- Aguirre Armendáriz, Elizabeth - Centre of Studies and Research about Drought - <a href="mailto:eaguirre@sequia.edu.mx">eaguirre@sequia.edu.mx</a> - Academic</td>
<td>- Water</td>
<td>- (N.D.)</td>
</tr>
<tr>
<td>- Alanis Ortega, Gustavo - Mexican Centre of Environmental Law - <a href="mailto:galanix@lead.colmex.mx">galanix@lead.colmex.mx</a> - Organización no gubernamental</td>
<td>- Environmental Legislation</td>
<td>- Different “advising projects” and journalistic articles about Mexican environmental law</td>
</tr>
<tr>
<td>- Alatorre Edén Wynter, Rocío del Carmen - Hazardous Materials, Wastes and Activities, INE - <a href="mailto:rocio@lead.colmex.mx">rocio@lead.colmex.mx</a> - Governmental</td>
<td>- Environmental health</td>
<td>- (N.D.)</td>
</tr>
<tr>
<td>- Alatorre Frenk, Claudio - Consultant - c.alatorre.infosel.netmx - Private</td>
<td>- Energy and sustainable development</td>
<td>- Different articles in scientific magazines and chapters in books about energy, translator of different books and articles about sustainable development</td>
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<tr>
<td>- Albert, Lilia A. - (N.D.)</td>
<td>- Pesticides</td>
<td>- Co-author of one book and different articles about pesticides and environment in Mexico</td>
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<td>- Alborez, Beatriz (N.D.)</td>
<td>- Ecology and industry</td>
<td>- One book about environmental impact of the industry</td>
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<td>- Alcaráz Meléndez, Lilia</td>
<td>- Natural Resources</td>
<td>- One book about use and management of natural resources</td>
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<tr>
<td>- Alcárrceca Aguirre C. - (N.D.)</td>
<td>- Wildlife and natural protected areas</td>
<td>- Co-author of one book about wildlife and natural protected areas</td>
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<td>- Alexyer, M. (N.D.)</td>
<td>- Soils</td>
<td>- One book about soils microbiology</td>
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<td>- Almada Villela, P. C. (N.D.)</td>
<td>- Fisheries</td>
<td>- One article about fisheries</td>
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<tr>
<td>- Altamirano, René (N.D.)</td>
<td>- Water</td>
<td>- One article about water pollution control</td>
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<tr>
<td>- Alvarado Días, J. (N.D.)</td>
<td>- Wildlife</td>
<td>- One article about marine turtles</td>
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<td>- Alvarez Cárdenas, Sergio - Centre of Biological Research of Baja California Sur - Academic</td>
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<td>- Álvarez Icaza Longoria, Pedro C. - Unity of Economic and Social Issues, SEMARNAP <a href="mailto:palvarez@lead.colmex.mx">palvarez@lead.colmex.mx</a> - Academic</td>
<td></td>
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<tr>
<td>- Amaya Brondo, Abelardo (N.D.)</td>
<td>- Water</td>
<td>- One book about development of irrigation zones</td>
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<tr>
<td>- Amezcua Linares, Felipe (N.D.)</td>
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<td>- One book about marine biodiversity in the Central Pacific of Mexico</td>
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<tr>
<td>- Yerson, F. (N.D.)</td>
<td>- North American trades and environment</td>
<td>- One article about environmental impacts of NAFTA</td>
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<tr>
<td>- Andrade Salaverria, Dora Patricia - AN Advisers <a href="mailto:dyrade@mexis.com">dyrade@mexis.com</a> - Private</td>
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<tr>
<td>- Angulo Carrera, Alejandro - Federal Attorney for the Protection of the Environment, SEMARNAP - <a href="mailto:angulo@lead.colmex.mx">angulo@lead.colmex.mx</a> - Governmental</td>
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<tr>
<td>- Anta Fonseca, Salvador - UNAM - Academic</td>
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<tr>
<td>- Aragón Durand, Fernando of Jesus - Iberoamerican Univ. Gulf-Centre <a href="mailto:mregis@openlink.com.br">mregis@openlink.com.br</a></td>
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<tr>
<td>- Ecology, population, urban development, SD</td>
<td>- Co-ordinator of the program of SD of the Iberoamerican Univ., Campus Gulf-Centre</td>
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<td>Autonomous University of Baja California</td>
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<tr>
<td><a href="mailto:grambur@faro.ens.uabc.mx">grambur@faro.ens.uabc.mx</a></td>
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<td>Natural resources</td>
<td>- Co-author of one book about use and management of natural resources in the Mexican state of Baja California Sur</td>
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<td>Argueta Villamar, Jorge Arturo</td>
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<td>- One book about history of water in Mexico</td>
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<td>Astier Calderón, Marta</td>
<td>Agriculture, ecology, and use</td>
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<tr>
<td>Appropriate Technology <a href="mailto:mastier@lead.colmex.mx">mastier@lead.colmex.mx</a></td>
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<td>Athie Lambarri, M. (N.D.)</td>
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<td>Azuela de la Cueva, Antonio</td>
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<td>- Articles about traditional management of natural resources, culture and society</td>
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<td><a href="mailto:hbravo@servidor.unam.mx">hbravo@servidor.unam.mx</a></td>
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<td>Breceda Solís-Cámara, Aurora</td>
<td>Natural resources</td>
<td>- Co-author of one book about conservation of natural resources in the Mexican state of Baja California</td>
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<td>Biodiversity</td>
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<td>Secretary of SEMARNAP</td>
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<td>- She has been in charge of the Mexican Env.Ministry (SEMARNAP) during the last 6 years.</td>
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<td>- Caro Gómez, Rosendo Antonio - SEMARNAP - <a href="mailto:acaro@lead.colmex.mx">acaro@lead.colmex.mx</a> - Governmental</td>
<td>- Environmental management, natural resources, biodiversity, energy, community development and forests</td>
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<td>- Castañares Maddox, Eric John - SEMARNAP - <a href="mailto:ejcm43@yuc1.telmex.netmx">ejcm43@yuc1.telmex.netmx</a> - Governmental</td>
<td>- Public policy, and use and natural protected areas</td>
<td>- Responsible of projects regarding planning and use, natural protected areas inter-sector relations and environmental protection in the Mexican state of Yucatan</td>
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<td>- One article about management of water in Mexico-City</td>
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<td>- Cervantes Abrego, Mauricio - Areas of Important Birds of the North West Region - <a href="mailto:mcervan@lead.colmex.mx">mcervan@lead.colmex.mx</a> - Governmental</td>
<td>- Fauna and protection of natural areas</td>
<td>- Co-ordinator of the plan for the restoration of ecological areas in the Dam of Silva, state of Guanajuato</td>
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<td>- Césarman, Fernando, - (N.D.)</td>
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| - Chapela Mendoza, Francisco Javier  
  - Rural Studies and Advising  
  - fchapela@lead.colmex.mx  
  - Non governmental organization  
  - Academic  | - Land use, forests, rural development | - Participation in projects of technical advise for the management of natural resources and use in rural communities of Mexico |
| - Chávez Ortíz, César Rafael  
  - International Conservation, Mexico Ibero-American University  
  - crchavez_98@yahoo.com  
  - Non governmental organization.  
  - Academic  | - Environmental planning, conservation, environmental education, natural protected areas, cont. in urban areas, regional planning | - Participation in projects about Environmental planning, conservation, environmental education, natural protected areas, contamination in urban areas, regional planning |
| - Chávez, Juan Manuel  
  - Department of Man and his Environment, UAM-Xochimilco  
  - Academic  | - Urbanization | - One article about urban ecology in Mexico-City |
| - Cirelli, Claudia  
  - College of San Luis  
  - Ccirelli@colsan.colmex.mx  
  - Academic  | - Water | - (N.D.) |
| - Colmenero Rolón, L del C.  
  - (N.D.)  | - Environment and development | - One book about the relation between environment and development in the Mexican sate of Quintana Roo |
| - Coria Bennett, Rocío  
  - Centre of Biological Research of Baja California Sur  
  - Academic  | - Biodiversity | - Co-author of different books about biodiversity in the Mexican state of Baja California Sur |
| - Cortés C., Fernando  
  - The College of Mexico  
  - Academic  | - Poverty and other social aspects of development | - |
| - Cortinas de Nava, Cristina  
  - General Director of Hazardous Materials, Wastes and Activities, INE  
  - mcortinas@ine.gob.mx  
  - Governmental  | - Use and management of chemical substances, hazardous activities, disasters, and environmental risk | - Co-ordinator of different books, brochures and programs about use and management of chemical substances, hazardous activities, disasters, and environmental risk |
| - Coulomb, René  
  - Research Area of Sociology, UAM- Azcapotzalco  
  - Academic  | - Urban development, population and environment, urban policies, urban poverty | - Six books, different chapters in books and different articles in scientific magazines urban development, population and environment, urban policies, urban poverty |
| - Cristán Frías, Arturo  
  - Hazardous Materials, Wastes and Activities, INE  
  - Governmental  | - Industry | - Author of one book about industrial environmental policy and co-author of different brochures |
| Cruz Miramontes, Roberto (N.D.)  | - Water | - One article about water legislation |
| - Dávila Poblete, Sonia  
  - Mexican Inst. of Water Tech. sodavila@chac.imta.mx  
  - Governmental  | - Water | - Articles about social participation and water |
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<td>Saving of Energy</td>
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<td>Health, security, environment</td>
<td>Articles about health and environment</td>
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<td>Ecology and use of coastal zones and strategic planning</td>
<td>Participation in a program of Autonomous University of Baja California about conservation of the environment - Participation in two research projects in applied ecology and use of coastal zones</td>
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<td>One book about the lake system in the Basin of Mexico</td>
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<td>Ezcurra, Ezequiel - San Diego History Museum - <a href="mailto:eezcurra@sdnhhm.org">eezcurra@sdnhhm.org</a> - Academic</td>
<td>Biodiversity, urbanization and management of water basins, environmental history</td>
<td>Books, articles in scientific magazines and chapters in books about environmental history, water and urbanization in the Basin of Mexico, biodiversity, and urbanization and management of basins</td>
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<td>Fernández Lomelín, Luis Enrique - Ibero-American University Gulf Centre - <a href="mailto:fernye@lead.colmex.mx">fernye@lead.colmex.mx</a> - Academic</td>
<td>Water, air pollution, environmental conservation, environmental impact, management of natural resources</td>
<td>Participation in projects about environmental impact and protection, and environmental auditing</td>
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<td>Fernández Mejía, Enrique - Centre of Scientific and High Education of Ensenada - <a href="mailto:efernan@lead.colmex.mx">efernan@lead.colmex.mx</a> - Academic</td>
<td>Environmental risk and impact, environmental legislation</td>
<td>Participation in a project about sustainable development - Industrial advising regarding environmental risk</td>
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<tr>
<td>Fernández Rodríguez, Francisco José - Mexican Foundation of Technology Innovation and Transfer for the Small and Medium Enterprises - <a href="mailto:Cyberff@arkanetcom.mx">Cyberff@arkanetcom.mx</a> - Private</td>
<td>Technology, environmental education, planning, enterprises, sustainable development and communication</td>
<td>Participation in projects about technology transfer, communication and environmental planning</td>
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<td>- Biodiversity - Co-author of two books about biodiversity and use</td>
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<td>- Forests, rural development, environmental impact and use, biodiversity - Participation in one program about biodiversity in Mexico - Participation in different projects about use, conservation and management of forests</td>
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<td>- Environmental education - One book about influence of the environment in education</td>
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<td>- Biodiversity - One book about natural regions in Puebla</td>
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<td>- Gallina Tessaro, Patricia - Centre of Biological Research of Baja California Sur - Academic</td>
<td>- Natural resources - Participation in three books about natural resources and biodiversity in the Mexican state of Baja California Sur</td>
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<td>- García Ballinas, Victor - Newspaper “La Jornada” - Private</td>
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<td>- García Barrios, Luis - South East Centre of Ecological Research - Academic</td>
<td>- Indigenous people, agriculture - Participation in seminars organized by LEAD-Mexico - Books and articles in books about agriculture and environment</td>
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<td>- García Calderón, Jorge - (N.D.)</td>
<td>- Water - One book about hydro-geology in one region of Zacatecas</td>
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<td>- Water - One article about cultiv. systems, irrigation and control of water</td>
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<td>- García Cubas, Antonio - (N.D.)</td>
<td>- Biodiversity and ecology - One book about biodiversity in Tamaulipas</td>
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<td>- Forests - One book about management and use of forest by peasants</td>
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<td>One article about urban ecology in Mexico-City</td>
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<td>One book about poverty and environmental deterioration&lt;br&gt; Participation in seminars organized by LEAD-Mexico</td>
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<td>- Garduño, René&lt;br&gt; - Centre of Atmospheric Sciences, UNAM&lt;br&gt; - Academic&lt;br&gt; - Climate</td>
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<td>- Garibay Velasco, Ricardo María&lt;br&gt; - <a href="mailto:rgaribay@lead.colmex.mx">rgaribay@lead.colmex.mx</a>&lt;br&gt; - Governmental&lt;br&gt; - Environmental impact, indigenous people, natural resources, environmental education and communications</td>
<td>- Participation in projects about environmental impact&lt;br&gt; - Producer of videos about environmental issues such as indigenous people and management of natural resources</td>
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<td>- Garibay, Claudio&lt;br&gt; - (N.D.)&lt;br&gt; - Regional development, indigenous people</td>
<td>- Participation in the Program for the Regional development of the “Purépecha” Plateau</td>
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<td>- Garza Caligaris, Rosa Isabel&lt;br&gt; - Coordination of Women Projects&lt;br&gt; - <a href="mailto:educegr@laneta.apc.org">educegr@laneta.apc.org</a>&lt;br&gt; - Non governmental organization&lt;br&gt; - Education, gender and health</td>
<td>- Participation in educational projects and health programs for women in rural areas</td>
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<td>- Garza Salinas, Mario&lt;br&gt; - Iberoamerican University, Santa Fé&lt;br&gt; - Academic&lt;br&gt; - Disasters</td>
<td>- Co-ordinator of two books and author of different chapters in books about disasters in Mexico</td>
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<td>- Garza, Gustavo&lt;br&gt; - (N.D.)&lt;br&gt; - Urbanization</td>
<td>- Author and co-author of various books, chapters of books and articles in scientific magazines about development (urban – industrial) in big cities of Mexico</td>
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<td>- Gerez Fernández, Patricia&lt;br&gt; - Mexican Civil Council for the Sustainable Forestry, A. C.&lt;br&gt; - <a href="mailto:pgerez@edg.netmx">pgerez@edg.netmx</a>&lt;br&gt; - Non governmental organization&lt;br&gt; - Forests, rural and regional development, biodiversity</td>
<td>- Participation in programs of forest assessment for the certification according to international standards&lt;br&gt; - Co-author of two books about biodiversity and conservation in Mexico</td>
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<td>- Gispert, Montserrat&lt;br&gt; - UNAM&lt;br&gt; - Academic&lt;br&gt; - Biodiversity</td>
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<td>- Glender Rivas, Alberto Ignacio&lt;br&gt; - Secretary for Foreign Relations&lt;br&gt; - Governmental&lt;br&gt; - Environmental diplomacy</td>
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<td>- Gómez Pompa, Arturo&lt;br&gt; - Program for the Use of Tropical Rain-Forest&lt;br&gt; - Governmental&lt;br&gt; - Natural resources</td>
<td>- Two books and four articles about biodiversity and management of natural resources in Mexico&lt;br&gt; - Participation in seminars organized by LEAD-Mexico</td>
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<td>- One book about applied methodology for the agriculture</td>
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<td>- González Cano, Jaime Manuel Project of the Crawfish in Mexican Caribbean - <a href="mailto:jgcano@lead.colmex.mx">jgcano@lead.colmex.mx</a> - Private</td>
<td>- Environment, fishery and natural resources</td>
<td>- Participation in projects about fishery and management of natural resources</td>
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<td>- González León, T. (N.D.)</td>
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<td>- Water</td>
<td>- Co-ordinator of one book about history of water in Mexico</td>
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<td>- Graf Montero, Sergio H. SEMARNAP - <a href="mailto:semarnap@fisher.autlan.udg.mx">semarnap@fisher.autlan.udg.mx</a> - <a href="mailto:shgraf@yahoo.com">shgraf@yahoo.com</a> - Governmental</td>
<td>- Water, population, natural resources and Biodiversity</td>
<td>- Co-ordinator of projects of social development and conservation of the biodiversity in the “Sierra de Manantlán” - Two articles about institutions and environmental management of the “Sierra de Manantlán”, Mexico</td>
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<td>- Guajardo, Beatriz Mexican Institute of Water Technology - <a href="mailto:betyg@riego.imta.mx">betyg@riego.imta.mx</a> - Governmental</td>
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<td>- Co-ordination of one project about irrigation methods</td>
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<td>- Guerra, Luis Manuel Autonomous Institute of Ecological Research - <a href="mailto:inaine@ri.redint.com">inaine@ri.redint.com</a> - Non governmental organization</td>
<td>- Technology and environment</td>
<td>- Participation in seminars organized by LEAD-Mexico - One book about hydrology in the Valley of Mexico</td>
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<td>- Guevara Ávila, Jean Paul Main University of San Andrés - <a href="mailto:jguevara@lead.colmex.mx">jguevara@lead.colmex.mx</a> - Academic</td>
<td>- Culture/environment linkages, population and development</td>
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<td>- Postel, Syra</td>
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<td>- One book and various articles about sustainable use of ecosystems and water</td>
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<td>- Quadri de la Torre, Gabriel</td>
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<td>Two books about urban ecology in Mexico-City</td>
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<td>Conservation of natural resources, biodiversity and ecology</td>
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<td>Natural resources, environmental education, rural development, ecotourism -</td>
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<td>Technological innovation, agriculture, economic history, water history</td>
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<td>Agriculture, soils deterioration and restoration</td>
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<td>Urbanization, migration, agricultural development, population and gender</td>
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- National Institute of Ecology  
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- Governmental | - Climate, environmental policy, urbanization | - Projects about of environmental policy and climate change |
| - Villalobos Zapata, Guillermo Jorge  
- Autonomous University of Campeche  
- Gvillalo@lead.colmex.mx  
- Academic | - Ecology, fishery, coastal zones | - Participation in projects about coastal ecosystems  
- Publications about coastal ecosystems |
| - Villareal, Diana  
- Department of Economic Production, UAM-Xochimilco  
- Academic | - Ecological regulation | - Co-author of one book about changes in the Mexican ecological regulation |
| - Villas Salas, Avelino (N.D.) | - Forests | - One book about increases in conifers forests |
| - Villaseñor Rios, José Luis  
- UNAM  
- Academic | - Biodiversity | - Co-author of one book about weeds of Mexico |
| - Viqueira, Carmen  
- (N.D.) | - Water | - Compiler of one book about hydraulic systems and agriculture |
| - Vizcaino Murray, Francisco (N.D.) | - Air pollution | - One book about air pollution in Mexico |
| - Von Mentz, Brígida (N.D.) | - Water | - Co-author of one book about water history |
| - Warman, José  
- Ministry of Land Reform  
- Governmental | - Agriculture, agricultural policies, agricultural production systems in Mexico | - Books, chapters in books and chapters in scientific magazines about agriculture, agricultural policies, and agricultural production systems in Mexico |
| - Yáñez Arancibia, Alejandro (N.D.) | - Coastal zones | - One book about ecology of coastal zones |
| - Yuñez Naude, Antonio  
- The College of Mexico  
- Academic | - Agriculture, genetic resources, environmental policy | - Compiler and co-author of books, articles in scientific magazines and chapters in books about agriculture, genetic variety of seeds, and environmental policy and community development |
| - Zagema, Bertam  
- (N.D.) | - Environmental participation and conflict | - One book about ecological crisis and social movements in Mexico |
| - Zamudio Tiburcio, Alvaro  
- (N.D.) | - Industry | - One book about environmental industrial policies |
| - Zepeida Orozco, J.  
- (N.D.) | - Water and industry | - Co-author of one book about supply and use of water in the industrial sector |
| - Zizumbo Villareal, Rogelio  
- Digital Projects  
- Zizumbo@lead.colmex.mx  
- Private | - Rural development, natural resources, coastal zones | - Co-ordination of research and technical teams regarding issues such as rural development, natural resources, coastal zones |
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<td>Fund of Economic Culture</td>
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<td>Latin American Faculty of Social Sciences</td>
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<td>ICRI</td>
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<td>Mexican Institute of Water Technologies</td>
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<td>INEGI</td>
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<td>ONG</td>
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<td>Ministry of Social Development</td>
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<tr>
<td>SEMARNAP</td>
<td>Secretaría de Medio Ambiente, Recursos Naturales y Pesca</td>
<td>Ministry of Environment, Natural Resources and Fishery</td>
</tr>
<tr>
<td>SEP</td>
<td>Secretaría de Educación Pública</td>
<td>Ministry of Public Education</td>
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<td>SRE</td>
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<td>Ministry of Foreign Affairs</td>
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<td>SRH</td>
<td>Secretaría de Recursos Hidráulicos</td>
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<td>North American Free Trade Agreement</td>
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<td>ZMCM</td>
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<td>Metropolitan Zone of Mexico City</td>
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1. The Rationale of HDP-Senegal

In March 1999, the desire to set up the National Research Group working on “Human Dimensions of Environmental Global Change” was granted financial support in the form of a seed money grant from IHDP. In conformity with the different stages mentioned in the request document, a letter of intention was sent to about fifty institutions and scientists. And those who replied were convened for a meeting on July 3, 1999 to set up the HDP-Sen National Research Group. On that occasion, a scientific committee of nine members was formed to prepare the first workshop. Three panels were constituted to draft the texts that were to be submitted to the attendants of the July 24 meeting for further discussions. The following themes were selected:

1. Senegal in the context of global environmental changes: what human dimensions? by Dr. Mame Demba Thiam
2. The vulnerability of the populations in the context of environmental global changes by Dr. Alioune Ba, and Dr. Jean Baptiste Ndong
3. A definition of population vulnerability in relation to the themes of land use and land cover change by Dr. Moustapha Thioune
4. Industrial transformations from an environmental point of view by Mr. Habib Diemé, Dr. Michel Seck, Ms. Ndèye Nguènar Cissé and Mr. Ibrahima Niang.

At a workshop held on August 6 and 7, different issues were discussed and recommendations made to identify prospective actions concerned with:
- the elaboration of a network of collaboration between all institutes involved in HDP-Senegal;
- the preparation of an international workshop on "Environmental and Social Communication in the Context of Global Changes".

2. List of speakers

Plenary session
Speaker: Dr. Mame Demba Thiam
President, the Honorable MP Mamadou Lamine Thiam

First workshop: The vulnerability of populations in the context of environmental global changes
Speaker: Dr. Alioune Ba
Chairman: Dr. Michel Seck
Reporter: Dr. Jean Baptist Ndong
Second workshop  
Speaker: Dr. Mamadou Moustapha Thioune  
Chairman: Saliou Diangar  
Reporter: (Ms.) Dr. Mame Arame Soumaré

Third Workshop  
Speaker: Dr. Michel Seck  
Chairman: Dr. Alioune BA  
Reporter: Ibrahima Niang

Restitution Session  
1 - By Dr. Jean Baptist Ndong  
2 - By Dr. Mame Arame Soumaré  
3 - By Ibrahima Niang  
Summary, recommendations, conclusions by Dr. Mame Demba Thiam

3. Proposals  
1. The environment, confinement and evolution of insular and lagoon areas  
2. Traditional fishing from an environmental point of view

4. Core themes (Key human dimension areas within the country)

“Senegal In The Context of Global Changes: What Human Dimensions” was introduced by Dr. Mame Demba Thiam. The session was chaired by the Honorable MP Mamadou Lamine Thiam, who moderated the debates following the introduction of the topic.

Right at the beginning, he restated the fact that Senegal was facing a lack of provisional means and tools. So, for him, it was urgent for environment specialists to develop these means and tools.

Then stress was laid on rural migration issues and on the subsequent development of “rural towns”, which shows a certain dynamism not yet fully understood by the specialists in most localities. However, in many regions where religious cities have become the points that polarise neighbouring villages, it is noted that localities abandoned by populations remain the major characteristics of rural landscapes.

Nowadays, international migration, which is a continuation of rural exodus, has turned out to be a much resorted to option. In this context, a typology of localities should be made in regard to the financial investment contributed by migrants.

The question about the relation between under-development and poverty should be dealt with by correlating wealth, development and environmental crises. A lack of studies on the different types of pollution was pointed out. Also, it is necessary to raise public awareness of bacteriological pollution caused by nitrate and heavy metals in the peri-urban areas of Dakar.

The workshop recommended that the strategies implemented for the fixation of populations be dealt with in relation to their social needs. But one may consider:

- what the needs of the populations are;
• what new agricultural products are grown for local consumption (sorrel, water melons, other fruits);
• what, in terms of responding to food demand, the immediate profitability of those products is in fact.

The workshop recommended that the possibilities of an industrial transformation of these new agricultural products and an exploitation and vulgarisation of medicinal plants be considered.

A methodology of research leading to development should become an option that explores social needs. Instead of being integrated, this approach should be integral. As such, among other important issues, it will concentrate on poverty, on the environmental crisis and on the institutional dimensions of environmental changes.

The displacement of populations from rural areas has caused the emergence of new workers specialised in urban activities, which involves a different use of their income.

In addition to discussing inefficiency in rural management, the workshop also dealt with the development of new areas of habitat in the vicinity of Dakar that lay bare the problems of the city’s characteristics in terms of its status in relation to the rural areas.

In its institutional dimensions, the disengagement of the State seen from the context of the prevailing lack of coordination reveals that such a policy favours the need for active research. This fosters a reflection on the transfer of State competencies to different localities.

What state competencies and managerial means have been transferred? Anyway, one may be tempted to wonder if the state has not discretely got rid of its heaviest responsibilities to the detriment of basic communities. It would be appropriate for financial backers sponsoring good governance to recommend a better exploitation of such an interrogation.

Today it is a necessity to make a distinction between the financial means of the rich and those of the poor (money laundering is an eloquent example). On the other hand, raising the question of urban development in relation to planning deficits is becoming urgent. Given the example of Saint-Louis, which is flooded every year, adequate solutions should be adopted to define a strategy of how space is occupied. In addition, the situation of Dakar, with its numerous re-locations of populations and the progressive shrinking of the Niayes Belt, shows that the displacement of people is not the adequate alternative.

Is there a need today to re-think and re-orient the current land management policy in relation to the context of environmental global changes? The relation between tradition and modernism in a worldwide context of environmental changes offers an opportunity to exploit our local languages. In fact, a better use of our national languages to raise awareness among people can be a decisive step toward equal opportunities in social and environmental communication. Inequalities in the distribution of natural resources have raised other national issues which environment specialists have not addressed yet. The question of attributions and strategies of development for each social sector is not clearly defined. In a nutshell, for a rational management of spaces, it can be forcefully asserted that funds are of vital necessity. And environmental changes should be understood by putting a stress on the various transformations (climatic parameters and incidences) in regard to the satisfaction of individual needs. Poverty aggravated by a lack of institutional assistance is
generalised along with the vulgarisation of cereal farming. What is the right solution to this problem? Floriculture? Tourism? But can tourism really be a substitute for agriculture if the Senegalese economy is mostly turned to the outside world.

Core themes

Areas of research
- What new instruments?
- What approaches and methodologies?
- What tools and models?
- What system of interpretation
- What standards, norms and indicators
- What schemes
- What parameters and criteria
- What concepts and definitions
- What typologies and systems
- What areas of research and hypotheses
- What appropriate scales (space, time)?

The above questions may favour interactions at national as well as at international level:
- an analysis of the context of vulnerability
- the notion of risk
- climate change
- the quantification of the consequences of socio-economic changes
- the intensification of the pressure on natural resources and its inevitable consequence for human beings.

The new phenomenon of globalisation and inequality in levels of development which is aggravated by the drought and other forms of ecosystem degradation, mainly in Sahelian countries mainly.

Climate changes

Contrary to the previous crises, the 1970s drought occurred in a particular context, which illustrates the inefficiency of the strategies of adaptation of the production systems.

Drought does not always manifest itself in terms of rain deficit but also in terms of an inter-annual variability which is beyond 30% most of the time. The movement of isohyetes southward has caused a degradation of the vegetation worsened by human action. The forest is shrinking towards the south and pasturelands in front of the desert. The Peanut Basin, which no longer exists, is an eloquent illustration of on-going devastation.

The workshop insisted on the need to articulate natural calamities bearing in mind the helpless attitude of people on the one hand and the limitations of provisional capabilities with the solutions to the crisis in developing countries facing an acute lack of means on the other.

It appears that all West African countries with a coast are vulnerable in regard to the economic value of the land, which is likely to be flooded if sea levels rise. This is explained by the fact that in all these countries, economic activities are generally concentrated in coastal areas for historical reasons (location of former trading posts
with ports convenient for the consignment of goods). Nearly everywhere in Africa, there is a noticeable contrast between population density in the coastal areas and the interior, which is barely populated and essentially agricultural, with only a poor contribution to the GNP.

The workshop also raised the question of the means and costs necessary to finance the preservation of economic areas. The following proposals were made:
- the use of affordable and practical construction works like seawalls;
- re-settling populations in safe areas in poor countries, which would be it would be more appropriate.

Here, the underlying policy is to tackle the environmental crisis with available means.

The workshop drew attention to the fact that the use of firewood as the sole source of energy in urban and sub-Saharan rural areas has greatly increased because of the extension of urban localities and the subsequent rise in wood consumption. Consequently, this phenomenon has accelerated the degradation of the vegetal cover.

The use of horse-driven ploughs in farming is being generalised for a better mastery of the agricultural season. Since crop rotation and fallow lands have become almost impossible because of a rapid population growth, the option for crop rotation on a ten-year basis has been recommended. Motorisation and the use of horse-driven ploughs has favoured the extension of farmlands and the diminution of fallow lands. The immediate consequence of this environmental degradation is that many farmers are now jobless. The workshop insisted on crop diversification and on the rise of the price of rich products.

Participants expressed their worries regarding the fixation of the populations and the new status of communities (10,000 to 15,000 inhabitants) which have caused a proliferation of rural towns. Such towns are always confronted with problems like electrification, cleaning and other services, which the state is usually in charge of. The workshop cited the case of M'Bour-City as an example. Its rapid growth requires a re-definition of the status of Malicounda, a neighbouring village.

Regarding the juridical, institutional and political terms related to land management, the status of Touba-City, which is revealing a new model of urbanisation, represents a critical issue. The workshop asked the following questions: How can the evolution of the city or group of cities be understood? What model of organisation is regulating such a phenomenon?

The conception of land use (cattle breeding). The mismatch between agriculture and cattle breeding is caused by environmental problems. For example, the development of the pastoral zone should be envisaged through an association of an intensive agricultural system (in terms of fertility and erosion) with pastoral cattle breeding of limited mobility. Community associations composed of farmers and cattle breeders co-ordinating their activities within a certain number of villages should be set up as soon as possible. Such organisations should be sustained by an official acknowledgement of a status guaranteeing mobile pastoral cattle breeding with specific ground laws. Only in such conditions can agro-pastoral activities be developed along with a protection of the environment able to preserve the growing needs of rural populations.
Globalisation and inequalities in levels of development

A special emphasis was laid on the gap between the North and the South, and on the consequences of the devaluation of the CFA Franc (currency). The issue of water scarcity, which forces populations to migrate, was also raised during the workshop. Questions such as money laundering, drug trade, unequal distribution of natural resources, economic recession, unequal access to information and the balkanisation of African States were referred to as well.

It is necessary to identify and categorise all problems and find enough means while taking into account:
- the chronic debt incurred by farmers;
- privatisation of public sectors;
- bored wells and water-pricing;
- the need of analysis of agricultural technologies (seeds, other inputs);
- the eventual integration of the notion of "user system";
- the crucial problem related to migration in the northern part of Senegal (land salinisation, problems of health in combination with water quality).

The renewal or modernisation of instruments of monitoring and analysis prompted us to raise the issue of methods of new technologies such as the automation of the monitoring of environmental changes.

The workshop pointed out the interdisciplinary character of the HDP theme, which has socio-cultural, anthropological, industrial, economic, technological, scientific and historical implications. Its aspect concerned with industrial transformations is a focus of interest in this research programme, which aims at minimising the risks of using traditional boats (pirogues) while preserving the sector’s economic growth.

Tourism as a strategy of development in the context of global environmental changes allows the following questions:
- What is endogenous tourism?
- Are local people employed by tourist centres?
It should be noted that Senegal hardly benefits from income generated by tourism.

The workshop underlined the fact that turning off bored-wells during the rainy season obliges people to fetch their daily provision of water from ponds and pools. Thus they are exposed to illnesses like Guinea worm. The participants also raised the problem of goitre-illness in some regions producing salt. This shows that the salt consumed in those regions is not iodated.

The workshop acknowledged that there should be a prerequisite to the implementation of research programs which would involve task sharing between HDP members affiliated to different institutions. According to participants, though the HDP national committee was set up through CLEAR, a common agreement on the modalities of partnership with other laboratories is becoming a necessity. They also gave the example of LARSA which is well-equipped to study the agricultural system and cattle breeding in rural and peri-urban areas. The approach they proposed is modelled on the example of UICN which, for research in national parks, resorted to the competencies of “Wet-Zone” network who are originally from organisations like CRODT, SENAGROSOL, CSE, UCAD, etc.

The workshop expressed the need to re-define a referential framework for a better understanding of the human dimension of environmental changes in Senegal. Also the participants discussed a number of methodological recommendations. The problem of renewal or modernisation of instruments led the workshop to talk about
some methods or new techniques such as automating monitoring of environmental changes.

The participants noted the transversal characteristics of the research themes, which involve socio-cultural, anthropological, industrial, economic, technological, scientific, and historical stakes. The aspect of the theme concerned with industrial transformation occupies a prominent place in the research program which aims at shifting constraints on the flotilla of traditional fishing composed of wooden pirogues while preserving the sustained dynamism in the sector.

The participants expressed their satisfaction with environmental action aimed at preserving a fragile biotope and the highest foliages of the trees forming the most stabilised forest layers (kapok-cotton trees, cail cedar, at trees). These host a considerable vegetal and animal biodiversity that constitutes the remnants of the greenery in the south of Senegal. The participants laid stress on communication as a means to raise awareness among social actors like fishermen who may have socio-economic motivations hostile to any proposal derived from action research.

A thorough reflection will be developed in the formulation of the communicative approach incorporating an elaboration of questionnaires and surveys. In this respect the suggestion made by IT-Focus group to set up a committee for action research on communication appears appropriate. The local communities in areas deforested because of the construction of wooden pirogues are more receptive to the policies of decentralisation in regard to environmental issues. In this respect the participants referred to article 3 of the law on decentralisation, which stipulates the possibility of the state to transfer to the rural community the management of the forest within its boundaries and the delivery of woodcutting licenses.

It would be greatly beneficial for pirogue constructors and other sculptors to set up a system of compensation for financial losses and other frustrations engendered by the interdiction of woodcutting. The workshop suggested to re-orient woodcutters, sculptors and wooden pirogue constructors toward an exploitation limited to firewood and charcoal production (60 % of the demand for firewood and charcoal is produced in the south of Senegal). To be sustainable, this type of forest exploitation should be restricted to collecting dry wood from fast growing species not yet menaced by environmental degradation.

It is necessary to study the system of management of the pirogues in order to identify and take into account the actors behind the scene of the fishing industry such as pirogue owners who usually work with youth organisations and fishermen’s associations in the form of leasing or franchise. An industrial unit constructing another type of pirogue not made of wood might not be economically profitable. But subsidies could come from financial backers (Global Environment Fund) whose rationale is to preserve the environment at all cost. The workshop laid a stress on the full involvement of social actors (local communities, farmers’ organisations, village associations, associations for women’s advancement) in the management of such an industrial unit if it were to be set up and perpetuated. Since environmental problems are being faced by most West African countries on the coast, the result of any successful project should be transferred and disseminated in the framework of sub-regional integration.
5. Critical recommendation

We only dealt briefly with the legal and institutional aspects of land management

- problem of dysfunction in the approach
- the impact of local currencies, depreciation

A discussion to determine every researcher's domain of intervention with the perspective of integrating the different approaches. Even if the issues of vulnerability is dealt with in Senegal some of its aspect remain unexplored.

On the other hand, particular stress should be laid on:

- freedom in research
- research convergence
- avoidance of duplicating research actions.

In dealing with the main topics there should be a focus on:

- environmental communication in relation to illiteracy rates
- the adverse effects of tourism on the environment.

It is a necessity to develop a framework of exchange like forums or workshops at a local, regional or international level (magazine and other publications). For this purpose, a meeting will be initiated between the National Research Group, the members of parliament in charge of environmental issues and the network of journalists interested in the same area. It is equally recommended to guarantee the full participation of laboratories on the basis of research convergence that has become apparent since the setting up of the National Research Group including other stages subsequent to the workshop. The focus should be on:

- elaboration of a research program;
- fund raising and design a plan of execution;
- setting up a permanent secretariat;
- identification of partners (grass-root communities, associations, NGO’s, different network of support and research on development);
- definition of research areas according to the HDP objectives that should be made accessible to any competence;
- development of a curriculum on “Communication and the Environment: tradition Vs. modernism”;
- identification of vulnerabilities among all the sectors;
- identification of the most sustainable environmental management or poverty alleviation;
- awareness campaign, monitoring, evaluation, in relation to the HDP objectives (research-action);
- appropriation or transfer of the research outcome.
6. Follow-up Activities

Another meeting is to be held in a month’s time to evaluate technical reports in order to draft a national program and sub-programs based on scientific cross-cutting. The problem of means and institutional tutelage will also be raised. In concluding the session, the workshop participants expressed their warm thanks to:

- IHDP, ISSC and UNESCO for its support through Seed Money Initiative
- the Honourable MP Mamadou Lamine Thiam for chairing the session and participating in the debates
- NGOs and associations (AFEE, GOSSIP - Operational Group of the Sahel for Assistance to Grass-root initiatives)
- the Department of the Environment (Ministry of the Environment and Preservation of Nature)
- Université du Sahel our sponsor and active partner
- ISRA (Institute for Scientific Agronomic Research)
- Tropis-Environment (Research Consultancy)
- Sahel Engineering (Consultancy)
- the Department of the Environment (Ministry of the Environment and Preservation of Nature)
- the Network of Members of Parliament for the Environment (National Assembly)
- GERCOM-NORD (Research Consultancy on Human Resources Management, Communication and Marketing)
- The Department of Tourism (Ministry of Tourism and Airlines)

7. Connected Institutions

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<th>Group of research and consultancy on decision-making</th>
<th>Research on relations between environmental changes and their repercussion on health</th>
<th>IRD (Research institute of development = former ORSTOM) ARDIS (Research association for integrated development in Senegal)</th>
<th>International Development Research Center (IDRC) Family planning development</th>
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<td>FRAO, PAIN Pour Le Monde, IFP, European Union, World Bank</td>
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<td>ISE (UCAD)</td>
<td>Research on industries, transport, wastes, recycling and reusing materials, energy, agriculture, and reinforcement of capabilities</td>
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<td>Research of territory management, hydro-</td>
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<td>IFAN (UCAD)IRD</td>
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| **Ceinture Verte (green belt) National Program, Ministry of the Environment and the Preservation of Nature** | **Reforestation, preservation, and conservation of nature**
| **Development of populations** | **GEF** |
| **Association Femme Enfant Environment (Women-Children-Environment Association)** | **Reforestation, agriculture, development for grass-root populations, family planning, literacy programs** | **Sponsoring and self-funding** | **Department of Water, Forest, and Game Hunting Local communities CONGAD Reseau 2000 of PNUD** |
| **Department of Chemistry (UCAD)** | **Industrial wastes, risks linked with the use of chemical products in industries** | **Faculty of Sciences (UCAD)** | **ASHOKA DOEN Foundation** |
| **CIERVAL, Gaston Berger University (UGB)** | **Socialisation of social changes: gender and environmental changes**
| **Changes in territorial administration**
| **Populations and environmental changes** | **CERTOP (Toulouse II-Le Mirail)**
| **CERSI (Ouagadougou, Burkina Faso)** | **IES (Université de Cocodi, Côte d’Ivoire** |
| **LARSA, Université du Sahel** | **Economic Analysis of the dynamic of agrarian systems** | **Université du Sahel** | **Forum du Tiers Monde IRD (former ORSTOM)** |
| **CLEAR Université du Sahel** | **Dynamic of landscapes in the context of global changes and environmental crises and population displacements** | **Université du Sahel UCAD** | **IDRC CODESRIA** |
## 8. List of Participants

### 06-07 août 1999

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<tr>
<th>Prenoms</th>
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<th>Institution</th>
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<td>El Hadj</td>
<td>SALL</td>
<td>UNIS</td>
<td>33, Sotrac Mermoz</td>
<td>824 99 75</td>
<td><a href="mailto:unis@syfed.refer.sn">unis@syfed.refer.sn</a></td>
</tr>
<tr>
<td>Mame Demba</td>
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Vietnam

HD Workshop Report (February 8, 1999)

1. Introduction
Vietnam set up an HD programme in 1998. Most scientific research on global change in Vietnam has a human dimension aspect. At the moment Vietnam is facing a twin challenge. The nation must maintain economic growth while coping with the emerging threat of global change. The human dimension issues have been involved in all problems of environment in this country.

To develop IHDP’s network in Vietnam, the Center for Environment Research Education and Development (CERED) and the Global Environment Programme at Hanoi University of Science organised the first meeting of the Vietnam HD Programme in collaboration with IHDP in Hanoi on February 8, 1999. The meeting brought together academics and policy-makers from different institutions and universities in the country. It identified key issues concerning human dimensions in environment and development, focusing on capacity building in global change, particularly with respect to institutions and land use and land cover change.

Discussions included:
- Environmental economy
- The social-cultural context of global change
- Land use and land cover change
- Human security and compatibility with institutions
- People and the environment
- Environmental issues and development.

The Coordinating body of Vietnam HDP set up during the workshop is as follows:

Chairperson: Dr. Nguyen Huu Ninh (Biology/Development Policy)
Coordinator: Dr. Pham Thi Mong Hoa (Geography)
Programme Manager: M.Sc. Do Thi Lan Phuong (Anthropology/Culture-History)
Secretary: Ms. Ngo Cam Thanh (Environmental Management).

2. Lessons from the meeting
The participants briefly presented their interests and studies in human dimension issues and focused on the network development of Vietnam HDP. They were unable to give proper abstracts on their discussions for the meeting report (as requested) because of a lack of research and policy application regarding the human dimension issues here.

3. Research
The researchers have worked in different areas and focused their interests on particular fields. The challenge of integrating natural and social sciences to achieve an enhanced understanding of the processes of change is recognised as an urgent problem.
The impact of social research on global environmental change is still limited. We should study the customs and habits in using resources to develop the economy. Collaboration among different scientific sectors would assess the habits and customs to research the relationship between communities.

The civilisation of the Red River is based on normal use of alluvial soil. There is no knowledge of using slope-land, resulting in an imbalance in land use in the ecological system.

The scientists would exchange databases to achieve a better understanding of other areas where they have to conduct their integrated studies.

The IHDP’s documents, such as Working Papers No.1: Scaling Issues in the Social Sciences and No.2: The Problems of Fit between Ecosystems and Institutions, are very useful for Vietnamese scientists involved in HD research.

Since socio-economic research has recently assumed a more significant role in the context of economic development in Vietnam, policies should be developed from HD research.

4. Network

Establishing the Vietnam HD network was an important topic of the meeting. The participants focused on linking up network members involved in HD research. The network members were called upon to inform each other about developments in their research for a better understanding of HD issues in Vietnam. The secretariat will provide necessary information and IHDP documents to the network members. The secretariat can help the HD get in touch with other organisations and assist in research proposal development.

5. HD priorities in Vietnam

The work on the coastal zone (through IGBP-LOICZ /WOTRO) is related to Focus 4 on integration of socio-economics into mangrove rehabilitation in the Red River Delta. The integrated study on global change and the Red River Delta has been developed in the Red River Delta Research Programme for 1999-2001, organised by the Dutch-Vietnamese Joint Research Programme, and the Human Impacts on Resource Use is a part of that programme.

The Vietnam HDP has developed a proposal to the Asia Pacific Network on Global Change (APN) that will address the issue of El Niño and La Niña impacts on Vietnam and Southeast Asia. It is to consist of two components:

First, a workshop which will examine the impact of the El Niño/La Niña phenomenon on Southeast Asia (focusing on the neglected region of Cambodia, Laos and Vietnam), taking an interdisciplinary perspective and paying particular attention to social and economic consequences, policy lessons and implications regarding the longer-term impact of global environmental change.

Second, an information project addressing scientists and policy-makers that will build on the results of the workshop by promoting further research and policy development.
The proposal has been funded by APN for the period 1999-2000. Research proposals on land use and land cover change have been prepared and sent to START/SARCS and GEF/NASA for funding consideration for the period 1999-2001.

The Vietnam HDP has also been involved in the UNEP/UNU/NCAR Project in 1999-2000 on Reducing the Impacts of Environmental Emergencies through Early Warning and Preparedness - The Case of El Niño Southern Oscillation (ENSO), funded by the United Nations Foundation for International Partnership.

The workshop’s participants suggested that a meeting on HD and policy development be organised in Hanoi, where the scientists and the policy-makers would work together on HD issues and implications in Vietnam. The meeting proposal will be developed in the future.

6. Core themes

- Land Use and Land Cover Change
- Biodiversity
- Coastal Zone
- Water
- Climate
- Health
- Human Security
- Culture/Perception/Behaviour

7. Research proposals and follow-up activities

The research proposals on HD will be prepared by individuals or by the groups of scientists. The Coordinator and the Programme Manager of the Vietnam HDP will contact the scientists and the institutions in Vietnam to identify the appropriate proposals and design the further activities in HD research in Vietnam.

8. Conclusion

The meeting:
- brought together natural and social scientists from different institutions to work together in the HD network in Vietnam and set up a secretariat of Vietnam HD.
- identified priorities and core themes of HD issues for research in Vietnam.
- recognised the importance of HD research and its implications for policy development.

9. Appendices

- List of Participants
- List of Observers
- List of Speakers
## Appendix 1. Workshop Participants

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## Appendix 2: List of Observers

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Appendix 3: List of Speakers

**Dr. Nguyen Huu Ninh**, CERED/HUS:
“Introduction to IGBP/IHDP and Vietnam's frameworks”

**Prof. Le Ba Thao**, Chairman of Geographical Association of Vietnam:
“Guideline on integrated research with natural and socio-economic sciences”

**Dr. Tran Viet Lien**, Climate Research Center:
“Overview of global environmental change: scientific background”

**Dr. Pham Thi Mong Hoa**, Human Geography, Research Center:
“Human dimensions on global environmental change”

**Dr. Hoang Minh Hien**, Remote Sensing Division, HMS:
“Overview of LUCC in Vietnam”

**M.Sc. Vo Thanh Son**, CRES:
“Human dimension of land use and land cover change in up-land areas of Vietnam: Tuyen Quang case study”

**Dr. Nguyen The Chinh**, National Economics University of Hanoi:
“Introduction to environmental economics”

**Mrs. Ngo Cam Thanh**, CERED:
“Social incidence of wetland conservation in Quang Ninh province: data and methods”

**Dr. Nguyen Huu Ninh**, CERED/HUS:
“Socio-economic impacts of ENSO in Vietnam”

**Mr. Nguyen Ngoc Binh**, Vietnam Institute of Forestry Science:
“Forestry-land allocation and environmental issues”

**M.Sc. Do Lan Phuong**, Vietnam Institute of Culture and Arts Studies:
“Ethnics people and culture-environment”

**Mrs. Pham Kim Oanh**, Ministry of Agriculture and Rural development:
“Decision-making processes for agricultural development and environmental issues in up-land areas: case study in five up-land provinces of Northern Vietnam”

**Dr. Phung Quoc Bao**, Vietnam National University:
“Environmental modelling”

**Dr. Do Duc Dinh**, Institute of Global Economy:
“Socio-economic aspects for innovation process development”

**Mr. Nguyen Lam Hoe**, VUSTA:
“Sustainable development and economic tools”

**Dr. Nguyen Huu Ninh**, CERED/HUS:
“Priority of human dimension research on global environmental change in Vietnam”