

**Natural and socio-economic effects of erosion control in mountainous  
regions: A report and concluding remarks**

Miodrag Zlatic

Belgrade University, Faculty of Forestry, Yugoslavia

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mizlatic@yubc.net

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## **Introduction**

The International Conference on "Natural and Socio-Economic Effects of Erosion Control in Mountainous Regions", a contribution to the International Year of Mountains (IYM), was held in Belgrade and Banja Vrujci, 10-13th December 2002. This meeting was convened to explore and construct links between the biophysical and socioeconomic aspects of erosion control provision and to build on ideas emerging from earlier contributions to the IYM, not least September 2002's Headwater Control conference in Nairobi and the United Nations University's 'Public Forum: Mountains: Environment and Human Activities'. Copies of the Public Forum CD-rom and also the 'Nairobi 'Headwater' Declaration 2002' were included in the papers given to each delegate. Among other pressing motivations for this meeting was a desire to promote erosion control and the sustainable reconstruction of land and livelihoods in the troubled hills of the Balkan States and worldwide. This work would aim to bridge national divisions and reconstruct patterns of cooperation for the solution of a shared problem: depopulation and economic stress in the smaller communities of the Balkan hill country. This meeting also sought to start the work of re-building Yugoslavia's earlier eminence as a centre for innovation in erosion control, so bringing to a close years of isolation caused by political and civil conflict and UN sanctions.

This Conference was convened by the Forestry Faculty of the University of Belgrade, Yugoslavia, and co-sponsored by WASWC (World Association for Soil and Water Conservation) and the Belgrade-based NGO CEKOR "Center for Ecology and Sustainable Development". More than 70 delegates participated with more than a third arriving from abroad. In all 12 countries, including 5 of the Balkan States were represented: Albania, Australia, Austria, Bulgaria, Republic Srpska of Bosnia and Herzegovina, Czech Republic, Islamic Republic of Iran, FYR Macedonia, Switzerland, Thailand, United Kingdom, United States of America and Yugoslavia.

The conference was launched in Belgrade by Prof. Dr. Dragan Domazet, Minister for Science and Technology for the Republic of Serbia. This was followed by short welcome addresses from the Vice-Ministers of the Ministry for Agriculture and Water Management of Republic of Serbia Prof. Dr. Slobodan Petkovi, Ministry of Education and Sports of Republic of Serbia Mr. elimir Popov, Federal Secretariat for Labour, Health and Social Care-Environment Dept. Mr. Dunaan Jovi, Director of Directorate for Forestry of the Ministry for Protection of Natural Resources and the Environment of the Republic of Serbia Mr. Aleksandar Vasiljevi, the Dean of the Faculty of Forestry, University of Belgrade Prof. Dr. Milan Neai and Chief of the Dept. for Erosion Control, University of Belgrade, Prof. Dr. Stanimir Kostadinov. The ceremonial opening session was also addressed by foreign guests, the Vice-President of WASWC Prof. Dr. Martin Haigh (Oxford Brookes University, UK), the President of the International Association of Headwater Control - Prof. Dr. Josef Krecek (Technical University of Prague, Czech Republic), the Representative of CDE, Dr. Karl Herweg (Center for Development and Environment, University of Berne, Switzerland) and Prof. Dr. Ted Napier (Ohio State University, Columbus OH, USA), who spoke for the Soil and Water Conservation Society.

### **Key outcomes**

After the opening ceremony, the Conference transferred to Banja Vrujci to begin work. Here, the scene was set by a suite of key-note papers. The first charted the history of the WASWC's involvement in soil and water conservation work in hilly and headwater regions. This included discussion of major WASWC initiatives including WOCAT (World Overview of Conservation Approaches and Technologies) and the Better Land Husbandry Movement together with WASWC (Europe)'s local support of the 5 International Conferences for Headwater Control. Subsequently, each topic was represented by 2 key-note speakers: one foreign and one Yugoslav expert. This structure was adopted to help local participants assess the current status of the Yugoslavian profession in the world after the long and difficult period of UN sanctions and isolation that prefaced the democratic changes in Yugoslavia. These early sessions also included presentations from two local Water Management Enterprises engaged in technical erosion and torrent control works: "Erozija" from Valjevo and Nia. The promotion of these enterprises, which also provided financial assistance for the conference, was taken as an important feature of the Conference.

Papers were presented within three topics: (1) Water Erosion and its Control which dealt with the technical and biophysical assessment of erosion often at the regional scale; (2) Socio-Economic Effects which examined contrasting experiences concerning the implementation of erosion control measures and policies; and (3) Future Prospects of Development, the smallest section, which sought to integrate the biophysical and socioeconomic themes. For each section, a final discussion forum was organised after the all the papers had been presented, which attempted to draw together the key concerns of all

delegates and make the proposals and recommendations to be addressed in a concluding general plenary discussion forum.

## Plenary

The final plenary session, after a very dynamic and professional debate, proposed the following concrete conclusions, which represent the output the Conference. The conference, therefore, concludes thus:

1. Sustainable development principles and their implementation through sustainable land management practices are essential in providing a future for humanity.
2. In addition to promoting educational activities that increase public awareness of the long-term benefits of preserving a healthy environment, policy makers should strive to provide socioeconomic benefits to those who adopt sustainable land husbandry practices.
3. Studies of the natural and socio-economic effects of erosion and its control are needed to provide the public with the information required for achieving the long-term sustainability and to monitor the efficacy of land use policies and practices.
4. The environmental protection and conservation aspirations and advice commended successively by UNCED (Rio de Janeiro 1992), the World Summit on Sustainable Development (Johannesburg 2002), and the 'Nairobi 'Headwater' Declaration for the International Year of Freshwaters 2003' should guide our everyday practical work in soil and water management.
5. Across the Balkan States, erosion processes and erosion control problems, soil and vegetation conditions in watersheds, geological structures, climatic trends and conditions, the problems of forest and water management, and socio-economic circumstances are all very similar. This is why colleagues from the different Balkan States would benefit from working together to solve the problems these lands share. Consequently, this conference resolves to establish a working party to instigate and implement internationally coordinated soil and water management across the Balkans.
6. Erosion control is a key aspect of sustainable development and it plays an important role in integrated water management, as it strongly affects crops, soil fertility and all aspects of food and water supply.
7. Respecting the WASWC's policy to establish and coordinate a world-wide network of specialists in soil and water conservation, national branches for the WASWC were created for Yugoslavia (national representative Prof. Dr. Zlatic), Albania (Dr Ramazan Saraci) and FYR Macedonia (Prof. Dr. Ivan Blinkov).

During the course of the open discussions in the three technical sections of the conference, which preceded the final plenary sessions, the chairs of the groups established the following further conclusions:

## TOPIC 1: WATER EROSION AND ITS CONTROL

8. There exists a huge amount of experience on erosion control, including: (A) sustained environmental monitoring at various levels; (B) national/regional erosion/erosion hazard evaluations and maps. However, there is scope for a greater development of the use of remote sensing and GIS technologies for erosion control planning at the regional and local scales.
9. The major technical erosion control problems in mountainous regions are torrents and torrential floods. In mountainous regions, these occur as the consequences of erosion and topographic features. Torrent control is a pre-condition for sustainable development in mountainous regions. The successful management of torrents and mitigation of torrential floods also requires appropriate land use policies, including the scientific location of forest and farmland.
10. There is a need to emphasise and cost the multifunctional benefits of forests and apply the conclusion to more active and dynamic forest management strategies.
11. There is also a need to promote greater involvement of local people in the management of the commercial and conservation resources of the hilly areas, especially in forested upland watersheds.
12. Regular exchanges of experience and information can help optimise monitoring and guidance issued to policy makers. However, there was a need to coordinate the good work being done in experimental research basins and for the extension of hydrological regime data.
13. International participation can provide innovative ideas. WASWC & WOCAT provide tested frameworks & procedures for sharing knowledge. Moves should be made to establish local branches of WASWC in the Balkan region.
14. In view of the trans-boundary nature of both hydrological and climatic processes, erosion control and watershed management should be developed by teams that are both interdisciplinary and international.
15. An international working group should be created to coordinate erosion control and sustainable watershed management in the Balkan Region.
16. This plenary session concluded with one open question: how can erosion control and sustainable development specialists ensure that their research results are considered by decision makers in both the public and private sectors?

## TOPIC II: SOCIO-ECONOMIC EFFECTS: THE TASK AHEAD

17. Studies on economic & social impacts of erosion/erosion control remain underrepresented; there is a need for more integrated work and for a better integration between technical erosion control work and its functional benefits on the land. If research is to be conducted in the name of the public benefit, then this benefit should be fully assessed. There is a need for the systematic assessment of the social, economic and environmental costs and benefits of soil and water conservation.

18. Greater attention needs to be paid to assessing and enhancing the profitability of soil and water conservation works for those most directly involved. International experience indicated that erosion control works are most frequently sustained where there is an obvious and short-term economic return to the investments made.
19. Erosion control specialists needed to provide a better service to land managers. This should include, routinely, the provision of fully-costed multiple options for decision makers and the development of appropriate incentives and disincentives for motivating land managers. In support of this the following technical needs should be addressed: the development of reliable and valid assessment instruments, ways and means for encouraging inter-agency cooperation in conservation programs; methods for the assessment of responsibility of various actors in the conservation programming; and methods for conflict resolution;
20. Appropriate financial support is a prerequisite for much sustainable development. However, there is a need for better assessments of the successes of soil and water conservation subsidy and incentive programmes; the cost/benefits of structural changes in land use practices and the creation of appropriate agricultural systems.
21. Careful locally informed assessments of the relative merits of voluntary and coercive policy approaches to soil and water conservation are required.
22. There is a need for the provision of better social infrastructures to support soil and water conservation. Tasks include assessment of the most useful role for various government agencies and levels in local conservation programs and determination of the most useful roles for private and public groups in conservation programming;
23. There was discussion of the role of population pressure on the sustainability of land use patterns in the many places which are like the Balkan hill country, where the conservation planning has to be developed in the context of a failing local economic system and massive emigration of the younger and more productive elements of the workforce.

### TOPIC III: FUTURE PROSPECTS OF DEVELOPMENT

Many of the topic 2 themes were echoed by the discussion for Topic 3. However, this also tackled broader theme such as the property rights of land users, the rights of minority and disadvantaged groups, gender issues, transboundary problems and the likely impacts of globalisation. The group concluded that:

24. There is a need to promote procedures for more equitable land use policy making /decision making at local regional and national levels and for greater concern about the more effective implementation of plans and policies. This needed to be informed by improved awareness of the characteristics of sustainable land management and of the transboundary aspects of many of these problems.

25. There is a need for a better understanding and utilisation of existing legislation and institutions. There is also scope for the development of new or reformed laws, better land use guidelines, standards, limits and procedure for dispute resolution. In many cases, livelihoods and land management could be improved simply by means of improving procedures. Special foci, as always, are the particulars of local land tenure and the socio-economic situation.
26. There is a need to increase public involvement and participation through increasing public participation in decision making and also through increasing access to information. Enhancing the involvement of the local community, especially in decision making is a vital component of project success.
27. There is a need to investigate women's rights and issues and their significance for soil and water conservation planning and program priorities.
28. There is a need to develop a better understanding of the needs, perspectives and concerns of minority communities and disadvantaged sections of society with regard to soil and water conservation issues.
29. There is an urgent need to establish a glossary of standard definitions and terminology for sustainable development, soil and water conservation, and erosion control in the Balkan States.
30. There is an urgent need to investigate and plan for the impacts of globalisation on sustainable land use in the Balkan Region.
31. General conclusion: participants recommend that annual meetings should be convened to pursue and develop the priorities identified at this meeting.

This topic also concluded with some unresolved open questions:

32. How is it possible to achieve sustainability in the face of increasing environmental and economic degradation?
33. On what basis may the most appropriate balance between environmental protection and land use needs be established?
34. What is the role of "Social justice" in soil and water conservation programs?
35. What should be done with surplus crop land in high scale societies?
36. What is the role of the various "publics" in making decisions about conservation programs?

### **Field trip**

The excursion took place on the third day. Delegates visited the sites of erosion control works operated Water Management Enterprise "Erozija" - Valjevo. Hosts from the National Park Tara, as a demonstration of the potential for eco-tourism in these mountains, showed the delegates some of the most significant scenic resources and also provided a lunch consisting of the food derived from the Park's own "ecological resources".

### **Impressions of the Conference**

Following the conference, each participant was given a conference evaluation questionnaire that requested advice on the following: time schedule, presentations, conference organization, and excursion, social events during the Conference, general impressions and specific comments. The evaluation has not yet been completed by all participants, but it seems to be very favourable.

### **Media coverage and publications**

The technical sessions of the conference won national media coverage with delegate interviews appearing as a national news item on the main Radio-Television Serbia channel (RTS-1, Belgrade), and smaller reports being broadcast by Radio Valjevo and Radio Belgrade's Programme II.

The most immediate output of the conference will be the Proceedings volume, which will be published in February 2003 as a book. It is proposed that, later in the year, the conference team under Professors Zlatic and Kostadinov will prepare a fully edited and peer reviewed printed collection of the best papers from the conference. This volume will be published under the WASWC logo in 'Land Reconstruction and Management' (ISSN 1389-2541)', a series edited by Prof. Haigh, WASWC Vice President for Europe, and published through Science Publishers, Enfield NH, USA and Oxford & IBH, New Delhi.

### *President of Organizing Committee*

Miodrag Zlatic, D. Sc.  
Belgrade University  
Faculty of Forestry  
Kneza Viseslava 1  
11030 Belgrade  
Yugoslavia.  
Tel: +381 11 553 122  
Fax: +381 11 545 485