European Sediment Research Network

Acronym: SedNet

EC contract No.: EVK1-CT-2001-20002

Key action: 1.4.1 Abatement of water pollution from contaminated land, landfills and sediments

SedNet – Inaugural Conference
22 – 23 April 2002
San Servolo, Venice, Italy

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1. Introduction

1.1. SedNet

SedNet is the demand driven, European sediment research network. The SedNet mission is to be a European network for environmentally, socially and economically viable practices of sediment management on river basin scales. Due to the trans-boundary nature, no single water manager or country has the responsibility for solving sediment management problems at such scale. SedNet is established to help to structure and facilitate a European approach on this issue.

SedNet will annually organise a conference and several technical and socio-economic oriented workshops addressing riverine related sediment and dredged material management issues. Those responsible for that management can meet here with the experts who provide them with the demanded management approaches, tools, technologies and expertise.

The SedNet activities are financially supported for 3 years by the European Union under the Energy, Environment and Sustainable Development program and within area 1.4.1 on "Abatement of water pollution from contaminated land, landfills and sediments" (Thematic Network project, contract No. EVK1-CT-2001-20002, starting date: 1 January 2002).

More detailed information on SedNet and its activities are available via the SedNet website: www.SedNet.org.

1.2. Guide to this report

In this document the outcome of the first (inaugural) SedNet conference is described. The following issues are described in the next chapters of this report:

Chapter 2:	Summary of the conference, the opening and closing addresses of the chairman of SedNet Steering Committee and a brief description of the SedNet working groups and their workshops;
Chapter 3 – 8:	Working group 1 to working group 6 report of the parallel working group sessions at the 2nd day of the conference;
Annex:	List of participants to the above parallel working group sessions.

This document can be downloaded as PDF-file via the SedNet website: www.SedNet.org.

2. Inaugural Conference

2.1. Conference summary

The Inaugural Conference of SedNet was held at the SedNet home base at San Servolo Island, Venice, Italy at 22 and 23 April 2002. More then 120 people from 18 countries visited the conference. The detailed programme and a copy of the paperwork/proceedings can be downloaded via the SedNet website (www.SedNet.org).

Tiedo Vellinga, as chairman of the SedNet Steering Committee, opened the conference. He briefly addressed the sediment management area and the SedNet mission (section 2.2). Subsequently Stefano Della Sala welcomed the participants on behalf of the Venice International University and the center for Thematic Environmental Networks, who hosted the conference at the San Servolo Island. Jurgen Büsing of the European Commission addressed in his keynote sediment from a EU perspective, the expectations regarding the outcome of SedNet and he presented the outline of the 6th European Framework Program. He complimented the organisation upon the excellent job done to get sediment key-people together. The morning session was closed by four excellent keynotes on sediment management cases on a river basin scale. Els Kuijper, Jarmila Makovinska, Carlos Vale and Axel Netzand presented the Rhine, Danube, Tagus and Elbe basins respectively. The keynotes indicated clear similarities but also some distinct differences in cutting-edge sediment management issues for each basin. SedNet can indeed play an important role in giving guidance for this management and in the exchange of the needed management knowledge.

The two-hour lunch break (day 1 and day 2) was intensively used for networking and for studying the nearly 40 posters/papers presented by the conference participants. The papers can be downloaded via the SedNet website (www.SedNet.org).

In the afternoon session EU LIFE sediment project coordinator Klaas Groen presented the outcome of this project and Jos Brils, as SedNet coordinator, introduced SedNet. The 6 SedNet Working Groups (WG) were briefly introduced by the SedNet WG leaders (section 2.3). Unfortunately Martin O'Connor, the leader of WG 6 'Financial and economic aspects' was ill and, therefore, his presentation and his parallel WG session at day 2 of the conference had to be cancelled. Emanuele Zanotto, from the SedNet homebase, responsible for the organisation of the conference, closed the first day with logistical remarks.

The organisation of day 2 met great enthusiasm. Most participants highly appreciated the opportunity to discuss a whole day in parallel WG sessions (chapter 3 to 8). This was done in order to get a first idea of, and try to reach consensus on the actual, most urgent demands of problem owners related to the management of sediment and dredged material. A lot of participants expressed to be willing to stay involved in the WG activities and to be interested to take part in the WG workshops (section 2.4). Some participants even offered to prepare white papers on their specific area of expertise, thus helping the WG leaders to get an overview of the state-of-the-art on sediment management tools, techniques and knowledge. Therefore, it can be concluded that the WGs made a perfect start for the organisation of their specific activities.

Johan van Veen chaired the report back/wrap up from the parallel WG sessions. This made clear that there is a clear need for SedNet to prepare a strategic document that can serve as an umbrella for the SedNet activities to come. Finally, Tiedo Vellinga closed the conference by thanking the participants for the strong commitment and enthusiasm he had experienced during the conference and by stating that the strategic document should describe how to evolve from mission to vision to strategy to guidance (section 2.5).

At the conference it was also agreed upon that SedNet should express its interest in EU FP6 by submitting an Expression of Interest (EoI) for extension of SedNet to a Network of Excellence on the management of European sediment resources (SedNet-excel).[1]

2.2. Opening address chairman SedNet steering committee

"Good morning ladies and gentlemen,

The history of mankind is reflected in the sediment, so our future will be in the sediment. The water is only the carrier.

Ladies and gentleman, welcome to this conference.

It is very rewarding to stand here for you for start of the SedNet inaugural conference, after almost two years of preparation. The SedNet Steering Committee, the working group leaders, the SedNet home base and I as chairman of the SedNet Steering Committee, are very pleased that you want to be part of SedNet. We hope that we and this excellent setting of our get together may inspire you to a maximum participation in this inaugural conference and ongoing in SedNet. This conference which is aiming to further define the SedNet issues, your SedNet participation and what we are here for: to take of with the program.

Talking about the setting I want to thank the Venice International University for their excellent hospitality and for their kind corporation to facilitate the SedNet home base on this inspiring Isle of San Servolo. I would say the perfect ingredients for SedNet are at hand. The science atmosphere of the international university, with all its connections to the SedNet relevant world. The water and the sediment you cannot miss coming here. A much respected water and sediment management authority at hand in the Venice community and the Venice Port Authority. And the isle in itself seems like a perfect place for reflection needed for the development of sustainable sediment management strategies.

Talking about sustainable sediment management strategies brings me to the core business of SedNet. The EU Fifth Framework Programme Key Action Sustainable Management and Water Quality says: Life cannot exist without water. I would add life couldn't exist without sediment. The functioning of many ecosystems is entirely dependent on sediment and sediment dynamics. Water and sediment go together but the characteristics of both are very different. Water tends to dilute but sediment tends to accumulate. As I said at the start, history of mankind has accumulated in the sediment and not in the water. In the field of water management you have to be aware of this principle. The ecological risks in water tend to dilute as the ecological risks in sediment tend to accumulate.

The water can seem clean while the ongoing accumulation in the sediment, in the natural situation a very vital function, can still inhibit an unacceptable ecological risk. The sediment characteristics, its distribution patterns and the sediment functionality's therefore set the scene for the watermanager. And I would say it is our task the coming years to help to manage this scene. To help create this awareness. To advance risk-based, scientifically sound approaches for the evaluation of sediment management decisions. And to collect, develop, analyse and share data and information on the effectiveness of sediment management technologies and approaches.

[1] The draft EoI was prepared by the SedNet management (coordinator, working group leaders and steering committee members) and subsequently send to all SedNet participants (at that moment more then 450 persons, 350 organisations and 26 countries) for comments, suggestions and approval. Finally the definite EoI was send to the EC just before the deadline (6 June 2002). The SedNet-excel EoI can be downloaded via the SedNet website (www.SedNet.org).

One of our main objectives will be to develop on a river basin scale sediment management guidance that can serve and complement the implementation of the EU Water Framework Directive.

Another main objective of SedNet is to do this effectively in a network, to share knowledge, to make one plus one three. And it is a pleasure to see that many representatives of other for SedNet very important networks are present today.

From the start it has been the intention of SedNet to have a close corporation with existing networks, in order to strengthen, link and integrate knowledge and experience in all the networks.

A central theme in SedNet will be the triple P principle. The p's stand for the planet, the profit and the people. It aims a balanced integration of environmental, social and economic values. The planet to stand for the use of, in our case the functionality's of riverbasins with respect for nature, the profit for there can no protection without economy and the people for they must continue to feel the responsibility to act, not only for their, but also for future generations.

This brings me to the SedNet mission statement: 'The SedNet mission is to be a European network for environmentally, socially and economically viable practices of sediment management on river basin scale.'

I hope now the SedNet mission is clear and that we all together are ready and eager to start our challenging task. A task that is as, a thematic network, in a very essential way financially supported within the EU fifth framework program.

And finalising this opening address I now declare the SedNet inaugural conference to be formally started."

Tiedo Vellinga,
Rotterdam Municipal Port Management,
Chairman SedNet Steering Committee

2.3. Working groups (WG)

The main and final deliverable of the EU SedNet project is guidance for integrated, sustainable sediment management, from local to river basin level. The specific SedNet working groups, and especially their workshops, play a key role in achieving this goal.

In order to be able to effectively deal with this challenge, related sediment issues are handled in specific thematic working groups (WG). The WGs specialize in different aspects of sediment management from a technical (WG1 – WG4) and from a socio-economic perspective (WG4 – WG6):

- *WG1 Site investigation and characterisation*
  Led by Eric de Deckere , UIA, Belgium and Joop Bakker, RIKZ, The Netherlands
- *WG2 Contaminant behaviour and fate*
  Led by Damià Barceló, CSIC, Spain
- *WG3 Sediment treatment*
  Led by Giuseppe Bortone, ARPA, Italy
- *WG4 Planning and decision making - Opportunities for river basin planning of sediment management*'
  Led by Phil Owens, Cranfield University, United Kingdom
- *WG5 Risk management and communication*
  Led by Susanne Heise, TUTECH, Germany

- *WG 6 Financial and economic aspects*
  Led by Martin O'Connor, UVSQ, France

Contact details and a brief CV of the WG leaders, and a further description of the scope of each WG can be found at the SedNet website (www.SedNet.org).

2.4. WG workshops

The objective of each SedNet workshop is to exchange knowledge regarding state of the art tools, technologies, and approaches related to sediment management. Related to the scope of the working group, the workshop will produce the output needed for the preparation of the sediment management guide (see above). Furthermore, the workshop output will be used to prepare a project overview of the most import current international as well as national research projects.

The workshops will also play a key role in the identification of the most urgent demands of problem-owners related to the management of sediment and dredged material. The results will be summarised in a problem catalogue.

2.5. Closing address chairman SedNet steering committee

"Respected SedNet participants, SedNet friends,

The inaugural conference comes to a close, it is time for conclusions.

You all did a very good job. The Steering Committee, the Working Group Leaders, the SedNet Home Base and I have experienced a strong commitment and enthusiasm for SedNet.

The productivity, the results and our observations of the process of yesterday and today will help us focus our guidance for next steps. This was the first round, things are still on different tracks, and have different paces. It is now important that things not diverge, but come together. It is the challenge of all of us now to structure and to find the right common tracks, to develop a common language within SedNet. For that we will use all the input you gave, good suggestions you did, but also the critical remarks you made and we want to include answers to questions you raised.

The first next task of the Steering Committee and the Working Group leaders will be to manage this process. And tomorrow we meet here in Venice to evaluate and take the lead to write a process/policy document that can serve as an umbrella for the SedNet activities to come.

Elements in this strategic SedNet document will be the description of the evolution from mission to vision to strategy to guidance.

The mission now hopefully can be dreamed by all.

For the vision we think to include a message like: 'Recognize and protect the integrity of the natural system and the role and values of sediment, interfere with respect for this nature, find ways to protect the sediment and its values however with awareness of and anticipation on the natural recovery potential of the sediment.'

In the sense of strategy we think of shared ideas about the importance of the creation of public and political awareness as a very basic element, next to the exchange of knowledge and experience through networking within SedNet. And the setting up of shared decision making frameworks. This in order to define through this collaboration the best sediment management guidance we can give.

Guidance for instance, while recognizing the complexity, on how to define relevant processes, relevant stakeholders, identification of problems, general identification of solutions, how to make specific riverbasin strategies. A guidance that will stimulate creative solutions. With it to bring sediment management in Europe to a high professional level.

It is important that we distinguish processmanagement and contentmanagement. In processmanagement it is very important that you know were you are and know were the others are in process, to identify communication needs and collaboration needs. In the contentmanagement the information infrastructure is very important. And here the SedNet website and your wish to share information and negotiate knowledge are very important.

Clear: what can you expect from us in the near future:

1. A process/policy document as described.
2. A report on the contents and results of the seminar.
3. The most important conclusions of the Steering committee and what this means for the working group plans and working group participants.
4. A newsletter.
5. And last but not least we will draw up a proposal for an expression of interest to the EU 6th framework to become a Network of Excellence on Sediment Management.

The process/policy document and the expression of interest both need your input. Therefore you will be informed when these proposals are ready for your review. A review we will organize through the web. From you we expect your continuing participation and productivity as already committed, or soon to be discussed and committed between you and the working group leader.

Well this brings me to the end of this inaugural conference.

On behalf of the Steering Committee, the Working Group Leaders and the SedNet Home Base, thank you very much for your participation and excellent contributions. We hope to see you all in Venice again next year and also at the workshops.

I think we all agree that this was and is a bright location for the conference. And I would like to thank the Venice International University again for their kind hospitality. And I especially want to thank the staff here at the SedNet Home Base for their outstanding performance.

Well to close the event I wish you a continued pleasant stay in Venice and a safe trip home. See you next time!”

Tiedo Vellinga,
Rotterdam Municipal Port Management,
Chairman SedNet Steering Committee

3. WG 1: Site investigation and characterization

3.1. Objectives and program of first meeting

Monday, April 22nd.

Short introduction (10 ') by Joop Bakker.

Purpose was to attract attention to the work package and goal of WG1. Main item of the presentation: Eric de Deckere and Joop Bakker as WG-chairpersons did some preliminary work on the contents of WG1. Participants will eventually have to contribute to the effective work package and goal of WG1. This is, within limits with respect to the other working groups, open for input and discussion.

Tuesday, April 23rd.

This day was separated into 3 discussion sessions with participants of WG1. A list of the participants and of people who explicitly expressed their interest into WG1 is given in the Annex.

Session 1: Quality, quantity and origin

The first session started with a general personal introduction. The introduction focussed on their personal interest in WG1 with respect to their work at home. This ranged from getting information on the outcome of bioassay tests in other waters/sediments of Europe till getting to know how to apply bioassay testing. There was a big need for the exchange of knowledge on assessment methodologies and experiences.

Session 2: Triade, TIE and BDI

During the second session some short introductory notes were given by Eric de Deckere (on Sediment Quality monitoring in Flanders according to the TRIAD method), Werner Brack (If chemical analysis of priority pollutants and biotesting do not fit – Identification of toxic, mutagenic and Cyp1A-inducing compounds in contaminated sediments) and Juergen Gandrass (TIE, a promising tool in the scope of dredged material management?).

The purpose was to introduce TIE (Toxicity Identification Evaluation) and BDI (Bioassay Directed Identification) as a method to identify and prioritise the toxic compounds as the culprit chemicals in bioassay response.

The discussion showed the difference in the state of the art between European countries on this aspect.

3.2. Key issues and concerns of WG

Key issues

First of all the list of topics, based on the stakeholder demands from the original Sednet Questionnaire, was discussed. These topics will be addressed within the program of WG1. The following list was composed:

- International harmonisation and standardization of characterisation procedures (at least at river basin scale, including the 10 nautical mile marine coastal water zone for chemical compounds, mentioned in the European Water Framework Directive)
- Identification of real (ecosystem) effects
- Rapid screening methods, bioassays and TIE
- Background and/or reference concentrations

- Bioavailability of chemicals (interface with WG2)
- Mineralogical & physical characteristics (interface with WG2)
- Accumulation of sediments in wetlands and marshes (interface with WG4)
- Accumulation of sediments in lakes and reservoirs (interface with WG4 issue)
- More sophisticated investigation methods in order to reduce the amount of contaminated sediment that has to be dredged
- Local silting at sites of dreding
- Development of appropriate technologies for sediment dating
- Monitoring at river basin scale (including EWFD 10 mile marine coastal water zone)
- Rivers-lakes, freshwater-salt water: a different approach?

Two topics were skipped from the list, namely:

1. TBT-pollution in harbour sludge. It was believed that this topic was more relevant within the scope of WG 2.
2. International contaminant fluxes. This falls into the scope of WG 4.

Relation with other WGs

Considering the standardization and contaminant dynamics in sediments, the importance of mineralogy (e.g. clay fraction) was mentioned and the relation to food chain accumulation. This work would be an important cross-over between WG1 and WG2.

3.3. Organisation of WG

A number of people present at the 1st Conference has to inform at their home office how their institution and by whom will be represented in WG1.

It was proposed to establish a smaller "Core Group", numbering 1 representative per country (as final selection criterion), with a maximum of about 16 people. Those "Core Group" members can act as a central contact for SEDNET Working Group 1 in their country.

The Core Group members will be asked to spent some additional energy in assisting the WG1-chairpersons, attending all workshops (travel expenses being paid for by SEDNET), act as a national representative for WG1, act as a sounding board for WG1 activities and plans. To this extend we are looking for a balance between the scientific and authorities representatives. This could imply that from every country 2 representatives are required.

WG1 has planned to organize a total of 8 workshops, where each 2 workshops are combined in time and place. Workshops 1 & 2 are organized during session 1, WS 3 & 4 during session 2, WS 5 & 6 during session 3 and, finally, WS 7 & 8 during session 4.

3.4. Next WG meetings

Workshop 1 & 2: Ecological (WS1) and biochemical (WS2) assessment methodologies for sediment quality

The first two workshops are planned to take place in parallel at Antwerp at 25 – 27 September 2002. Due to organizational restrictions it was decided to stick to Antwerp for Workshop 1 & 2. Considering the importance to keep everybody "on-board" and the limited travelling budgets in less-rich European countries, it was decided to follow up on alternative meeting locations for the next workshops during Workshop 1 & 2.

A planning and a first announcement for the first two workshops will be spread during the second half of May.

Based on the general principle "to keep everybody on-board" WG1 decided to organize Workshop 1 & 2 as a very informative one. Items mentioned to address at Workshop 1 & 2:

- Compilation of a "Problem and Methods Catalogue" consisting of a number of items (Workshop 1,2)
- Overview of current guidelines and their application in European countries (EEC and non-EEC) (Workshop 1,2)
- Overview of existing strategies of bioeffect testing, best available techniques (e.g. TRIAD, etc.) (Workshop 1,2)
- Overview of currently applied bioassays (Workshop 1)
- Overview of currently used Biodiversity indices (Workshop 1)
- Overview of databases, containing bioeffect testing results. (e.g. TRIAD) (Workshop 1,2)
- Overview of standardization protocols (ISO etc.) (Workshop 1,2)
- Inventory of encountered problems (Workshop 1,2)
- Inventory of problem areas in Europe / participating countries, where site investigation and characterization has been implemented. (Workshop 1,2)
- Presentations of some top-problem case studies/areas (Workshop 1,2)
- Strategy and Plans for follow-up

All participants promised to sent information about sediment assessment methodologies that are used by their institutes to the working group coordinators Eric and/or Joop. Based on these documents a discussion/white paper will be made for the first workshop.

Next workshops

It was decided to await the outcome of Workshop 1 & 2, before defining TIE/BDI as the subject of **Workshop 3 & 4**. It could be wise to switch Workshop 3 & 4 with Workshop 5 & 6 in time, but on the other hand is the linkage with the SETAC conference in Hamburg an argument to keep TIE as the topic of the 3rd & 4th workshop.

Workshop 5 & 6 was planned to deal with the origin and quantity of problematic sediments. Closely related to the work of Working Group 4. With respect to this item it was mentioned, that mineralogy could act as tracer for the origin of sediments.

3.5. Any other business

Relevant (EU) networks and projects

Several networks are already operating at a European level, e.g. NICOLE with respect to soils. Experiences from those networks will be incorporated into SEDNET as a whole, e.g. by representatives present in the Steering Committee. At the WG1 level, we are also looking for EU Projects, which can contribute to the WG1 purposes. This is expressed in the second deliverable (ref. "Deliverables", see next section).

Actions to be taken

Deliverables

July 2002 1st Draft Problem and Methods Catalogue

July 2002 1st Draft Projects Catalogue

List of actions

Task	**Date**	**Responsible**
Drafting and distribution of the Conference 1/WG1 report	Before the 25th of May	Eric and Joop
Composing and distributing an overview of the work of working group 1	Before the 25th of May	Eric and Joop
Proposal for core group composition	Before the end of May	Eric and Joop
Working out program workshop 1 & 2	Before the end of May	Eric, Joop and core group
Sending information about assessment methods and relevant projects (descriptions) to Eric or Joop	As soon as possible	Everyone
First proposal for EoI for IP	18th of May	Eric and Joop
Submitting EoI for IP	7th of June	Eric and Joop

Expression of Interest

As preparation to the 6th Framework Program of the EC-RTD, the European research community is invited to submit "Expressions of Interest". Discussing this in the WG1 sessions did not culminate into an EoI, due to the fact that it was felt as impossible to identify research topics, large enough to meet the EC requirements for a "critical mass of research and development".

In the meanwhile, the issue was discussed with people who are more familiar with the European planning. They advised to submit an EoI for an Integrated Project with the working group, even if it was supported only by a small number of institutes. Therefore Eric and Joop prepared a first draft for an EoI, based on the discussion of the second day and the Normal Phase Workshop, which was held at the RIKZ on friday the 27th April. Then it was send to all the people present at the meeting in Venice and to other people interested in the work of working group 1 before the 18th of May. Finally the EoI for an Integrated Project has been submitted on friday 7th June, entitled: "Strategy for Integrated Chemical/Biological Assessment and Identification of Toxicants". This was done on behalf of the WG1 of SEDNET and the Normal Phase Working Group, submitted by RIKZ.

4. WG 2: Contaminant behaviour and fate

4.1. Objectives and program of first meeting

- To come to a proposal for the core group of experts interested to work closer with the WG leader in all issues related with the identification of demands/tasks, preparation of a problem catalogue and organisation of sessions and meetings
- To define boundaries of the WG
- To identify knowledge gaps
- To identify key problems regarding the actual research activities
- To cluster activities of EU sediment related projects, i.e. ABACUS, WELCOME
- To plan the different workshops and meetings

4.2. Key issues and concerns of WG

One of the first questions that was pointed out by some of the participants was to know what type of sediments we are dealing with. In this regard the EU is implementing the European Water Framework Directive (WFD) and it is clear that the management of water resources should be carried out at river basin scale. Consequently the focus of interest of WG2 will be: freshwater sediments, estuarine systems and dredged material. General opinion is that, although marine sediment contamination is important issue, it is necessary to tackle the problem as close to its origin as possible, and therefore starting point of WG2 should not be in the coastal area. It was suggested that the tidal limits (mean high and low water of spring tides) of coastal waters could be used to clearly define the geographical limits of WG2 interest.

The complex issue of behaviour (e.g. bioavailability, binding) and fate (e.g. degradation) of contaminants in sediments is being studied by numerous research institutes, within and outside Europe. The goal of these studies is to gain more insight into the factors that determine the bioavailability and understanding the release of contaminants. The problem of sediment contamination was associated, briefly, to different forms of sediment movement, either dredging, resuspension, floods, and to the risks associated with that movement. The different ways to evaluate such a risk was pointed out as one of the key questions to be answered by SEDNET.

At present substantial amount of knowledge, which represents a base for assessment of the risk of sediment pollution, is available. However numerous knowledge gaps are identified.

Gaps identified can be subdivided into several groups: knowledge gaps dealing with some general points related with the sediment contamination and diffuse pollution, dredging, speciation of contaminants, biotransformation and bioavailability, respectively.

The main **gaps in knowledge** are listed below:

- Knowledge about the main sediment traps, both man-made and natural is too fragmented and a holistic approach on the river basin level is required. How to predict behaviour in dynamic traps?
- Hydrodynamics is rarely included into consideration of behaviour and fate of contaminants. Modelling needed to understand and predict impact of floods, tides, accidents, deposition of dredged material into land, impact of climate changes etc. (interface with WG4)

- There is an increasing concern regarding the diffuse pollution (pesticides, sewage treatment plant effluents) at river basin scale, since point source pollution (industry) is increasingly controlled. Although a lot is known on the impact of farming practices into water there is a lack of information on soil, like for instance the impact of antibiotics contained in animal feed. The cost of diffuse soil contamination is not seen so much in sediment itself but in the consequences of the breakdown of the buffering capacity of sediment.
- There is lack of knowledge regarding the influence of environmental factors, natural and anthropogenic, for example influence of hydrological factors, long term behaviour of contaminants related to geochemical conditions, historical pollution, buffering capacity of sediments, etc.
- More research is needed to understand the role of sediments in filtration of water from river banks into groundwater
- Extrapolation of the results of laboratory studies is under the question, especially those conducted under different conditions (e.g. oxic vs. anoxic conditions)
- Open questions regarding the dredging are related with the resuspension and turbidity generated by dredging and shipping, relocation of dredged materials and subsequent problems connected with soil pollution, dredging in harbours.
- Needs for additional expertise related with the speciation and stabile forms of inorganic contaminants and necessity to transfer knowledge available (i.e. from mineralogists).
- Important question is possibility to control bioavailability. How organisms can modify sediment chemistry? Under which conditions, in view of climate changes, is possible to predict peaks of bioavailability (the worst case scenario)?
- Sequestration and bioavailability of pollutants. How can we elucidate the nature of sequestration-a slowly desorbing fraction- in sediments?
- How to define long-term behaviour (e.g. problem of radio-active contamination)?
- How to measure the freely dissolved pore-water concentration? How to discriminate between the dissolved forms of an analyte from its sorbed forms?
- How to predict consequences for ecological systems?
- Which contaminants should be included in risk assessment studies? Basic research has been done for some priority pollutants, however there is a broad range of emerging contaminants that need to be studied.

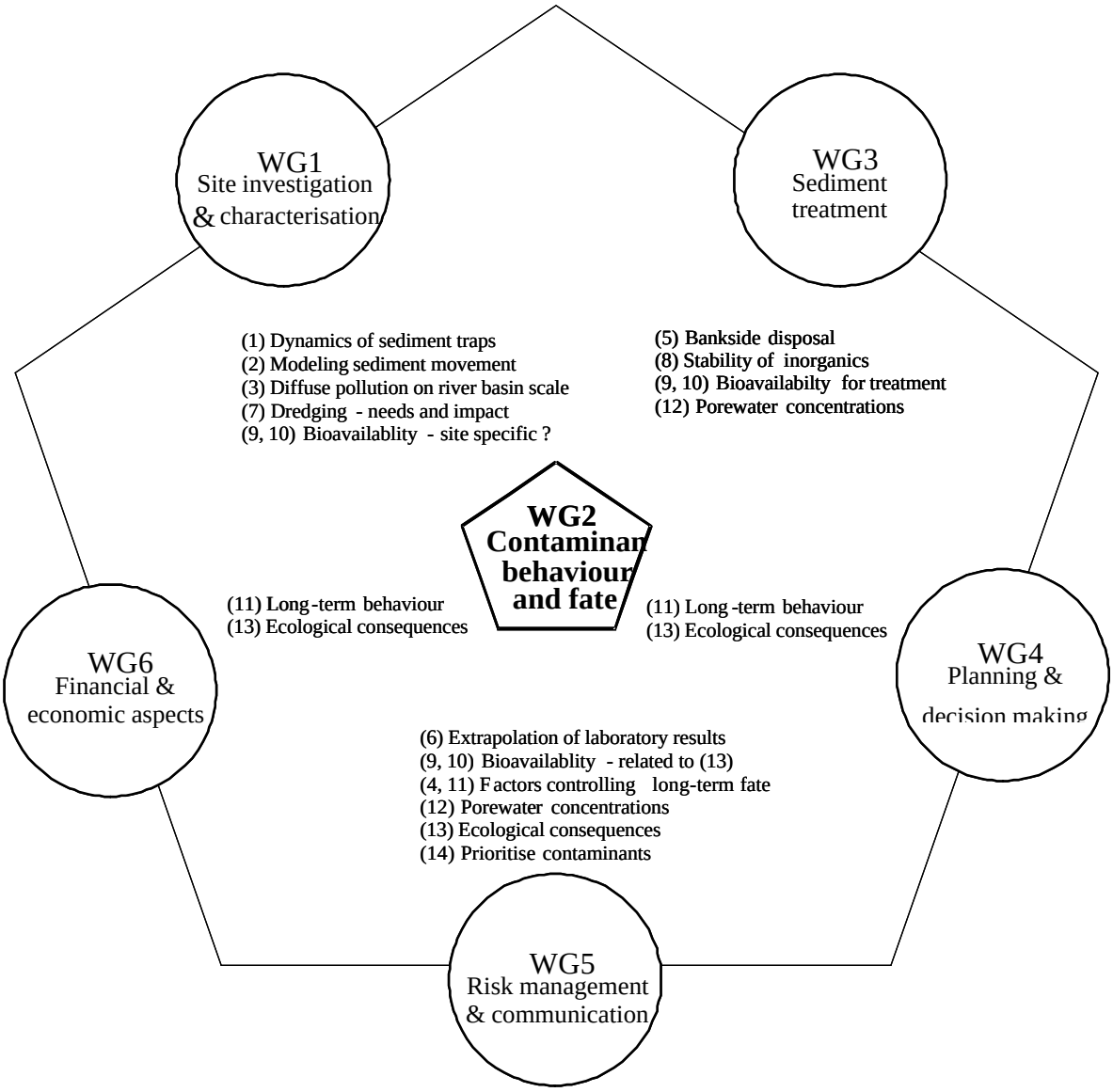
To fill these gaps and to gain more insight into the problem of contaminated sediments **multilayer approach** was proposed:

- *Source*
  Identification of source, mapping and characterization of parameters should be related with hydrology, reactivity, environmental conditions, change of conditions and their impact, suspension-resuspension
- *Analysis (chemistry/biology), in close cooperation with WG1*

  Choice of contaminants should be put in the frame of Water Framework Directive, with special emphasis on emerging contaminants. It is well known that only a limited number of substances can be chemically detected and target compound-chemical analysis hardly gives information about the bioaviailablity of contaminants. By using bioassays, and applying Toxicity Identification Evaluation (TIE) procedures, effects of contaminants can be detected (an example is effect-oriented approach in studying endocrine disrupting compounds).

– *Food-ecosystem-bioavailability, in close cooperation with WG1*
Basic approach risk assessment/TIE. Use of field organisms in studying bioavailability. Biotransformation of contaminants should be also studied in view of natural attenuation, long-term behaviour and relocation of sediment.

Relations with other working groups, which are likely to be of interest in filling knowledge gaps and feedback expected, are presented in the following chart.



2.3. Organisation of WG

WG will be organized through a Core group of experts interested in working closer with the WG leader in all issues related with the preparation of a problem catalogue and organisation of sessions and meetings. The Core group will be composed of 6-8 experts following the balance between the problem-owners (authorities) and problem-solvers (scientists).

Additionally, all WG participants are invited to contribute to the work of the WG and to sent their comments and additional information on specific problems in their areas.

2.4. Next WG meetings

The SedNet working group "Contaminant behaviour and fate in freshwater sediments and dredged material" will organize four workshops, which are indicated below:

1. Chemical analysis and risk assessment of emerging contaminants in sediments and dredged material, November 2002, Barcelona
2. Integration of chemical analysis/bioassay (TIE approach). Highly contaminated sites and dredged material, April 2003, Hamburg
3. Behaviour and fate of pollutants in sediments. Availability of pollutants to organisms, September 2003, Berlin. Co-chair P. D. Hansen
4. Transboundary rivers and monitoring programs of sediments. Bridging research with the implementation of EU water-related directives, 2004, Portugal or Spain

The First Workshop, which will be held in Barcelona from 28 to 30 November 2002, will focus on chemical analysis and risk assessment of emerging contaminants in freshwater sediments and dredged material. Emphasis will be given to chemical analysis of emerging pollutants, like aromatic sulfonates and endocrine disrupting compounds, isotopic speciation studies of organometallic compounds, to the movement of pollutants into river sediments, toxicity and risk assessment related issues and EU regulations.

Preliminary programme and all logistical informations regarding the 1st Workshop are published, and flyer distributed to all participants of SedNet Inaugural Conference. This information is also available through the web site www:wastewater-cluster.com

Expected output of the 1st Workshop:

We hope that this Workshop will be a communication platform and will provide enhanced cooperation between problem owners, like river water and harbour authorities and problem solvers, lake universities and public and private research institutions. Workshop recommendations will provide input to the Sediment Management Guideline that is the main deliverable of SedNet.

4.3. Any other business

No other important issues to be mentioned were discussed.

5. WG 3: Sediment treatment

5.1. Objects and program of first meeting

Monday, April 22nd.

Short introduction (10 ') by Giuseppe Bortone.

Brief description of the work package and goal of WG3. Giuseppe Bortone, as WG chairperson, did some preliminary work on the contents of WG3.

Tuesday, April 23rd.

During the Inaugural Conference, in order to optimise and to make fruitful all the future meetings, it has seemed opportune to fix a series of simple rules to be followed for the carrying out of the WG3 activities.

Participants agreed on the following:

- To deliver an useful tool for treatment scenario evaluation;
- To get researcher, practitioners and firms participation;
- To compromise innovation with applicability (open minds);
- To compromise confidentiality and transparency;
- To pursue an integrated approach;
- To pursue cooperation and purposiveness;
- To perform homework involving PhD, Post Docs, etc.
- Try to learn from mistakes;
- Never say:
    - I got the solution!
    - I did it a number of years ago! (But be able to avoid duplication of work and reinvention of the wheel!)
    - Never best (but better than another in these circumstances)
    - no one solution, solutions have to be found case by case (often combination)

5.2. Key issues and concerns of WG

Key-issues

The aim of WG3 is to evaluate, compare and implement in situ and ex situ treatment (clean-up) techniques/options for contaminated sediments and dredged materials.

In particular, WG3 activities are focused on technical issues regarding the development and dissemination of knowledge related to the widespread existing treatment techniques such as biological (bio-remediation) as well as physical and chemical ones.

Moreover, Land and Aquatic Disposal of sediments represent another purpose of WG3.

In all WG3 activities, particular concern will be given to the selection, evaluation and definition of:

- All the available existing Technologies for sediments treatment;

- *Unit Processes* – defined as a combination of one or more 'techniques' that influence each other, with common specified input and output material characteristics;
- *Attributes to unit processes* – defined as basic parameters for the characterisation of all Unit Processes like energy, chemicals, footprint, leaching, time, eco-toxicological risk, health and safety, product, waste production, conversion of components, air emission, operating costs and of the treated sediments like input/output chemical, physical and biological parameters – which have potential for use in a fast-track demonstration at a significant scale.

In particular, during the 1st WG3 Session, it has been established that the selection of the points listed above will be made using the following criteria:

- Sustainability (with the chance to apply LCA techniques, when is possible);
- Flexibility;
- Public perception;
- Environmental Impact (EI);
- Effectiveness;
- Implementability;
- Costs (operative, investment);
- Full scale suitability;
- Potential for beneficial use of (post-treated) dredged material.

Moreover, at the same time, it has been agreed upon the arrangement of a flow-sheeting database containing all the information collected during the activities of WG3 and on the basis of the data coming from other WGs as well.

The database to be implemented will constitute a tool and a guideline with recommendations for design, evaluation and comparison of sediment *Treatment Scenarios* (defined as a combination of Unit Processes interacted each other).

The required information will be selected referring to the following criteria:

- Characterisation of sediments (input-output);
- Identification and classification of technologies and unit processes;
- Definition of attributes to unit processes;
- Development of a database with flow-sheeting and optimisation (cost/benefit, including beneficial reuse);
- Creating of (new) treatment scenarios;
- Proposal for a sediment treatment guideline

Relation with other WGs

On the basis of the discussion it has been agreed the need to establish a pro-active co-operation between all the different WGs, according to their specific mission. More in detail the relationship between WG3 and other groups will be focused on the following topics:

<u>WG1 and WG2 Sediment characterisation for:</u>

- Source control;
- European standards (harmonization);

- Reuse standard and risk assessment;
- Chemical physical characterization;
- Bioavailability, toxicity, treatability;
- Evaluation of treatment efficiency;
- Quality standards for end products and sediment;
- Treatment scenarios selection.

WG4, WG5 and WG6:

- Integrated approach;
- Factor affecting scenarios;
- Economical aspects (costs).

5.3. Organisation of WG

Concerning the organisation of the activities to be performed by WG3, it has been established that the best way to proceed is to constitute two different sub-groups, each one to be reported by a specialist in the field.

The topics, the two sub-groups will deal with, are:

Sub-Group1: Ex-situ treatment
reported by Dr. Hakstege Pol and Dr. Hamer Kay;

Sub-Group2: In-situ treatment and disposal
reported by Dr. Pallemans Ivo and Dr. Soerjoesing Maya;

All WG participants can indeed contribute to the work sending contribution e-mailing to: palumbo@bologna.enea.it

5.4. Next WG meetings

The Next meeting will be held in Rotterdam, 28-29th of October 2002, and will be hosted by Rotterdam Port Authority, two days before the "Environmentally-sound Remediation of Contaminated Dredged Harbour Sludges and River Sediments into Useful Building Materials", held in Rotterdam from 30es of October to the 1st of November 2002

A draft of next meeting Programme has been structured as follow:

- State of the art:
  - Ex-situ treatment
  - In-situ treatment and disposal
- USEPA experience
- Inventory of innovative technologies and research projects
- Selection of the applicable technology (fast track) - first tentative
- Definition of the data base process units and their attributes (efficiency, sustainability, investment and operational costs etc.)

To facilitate discussion and collection of all information before and after the WG meetings, a dedicated internet site is going to be created.

All logistical information about next WG3 meeting will be published on the SedNet website http://www.sednet.org

5.5. Any other business

Actions to be taken

Participants agreed on the following homework activities:

Ex-situ treatment (Sub-Group1)

Preparation of a draft regarding the state of the art of the contaminated sediments treatment systems.

Dr. Hakstege suggested the following table of contents:

- Introduction
- Current situation in Europe
- Problem analysis, aim of treatment
- Treatment units:
  - ripening and landfarming, bioremediation, phytoremediation
  - separation and dewatering
  - cleaning up decontamination
  - chemical immobilisation, stabilisation
  - thermal immobilisation
  - others

In-situ treatment and disposal (Sub-Group2)

Preparation of a draft regarding the state of the art of the contaminated sediments treatment systems.

6. WG 4: Planning and decision making

6.1. Objects and program of first meeting

Monday, April 22nd.

Short introduction by John Quinton, giving a brief description of the work package and goal of WG4.

Tuesday, April 23rd.

Discussion on possible topics/key-issues to be handled in WG4, chaired and moderated by John Quinton, assisted by his co-worker Alison Collins.

6.2. Key issues and concerns of WG

Discussions during the workshop highlighted the following issues:

- The need to identify contaminant sources as well as sediment sources, and to relate contamination sources to sediment sources
- What is planning? Not scheduling but 'spatial management of sediments'
- Quantity or quality of sediment – which is the bigger issue? Varies according to decision-maker, location and stakeholder. Also how quantity and quality interact will determine the seriousness of sediment transport and deposition
- Need to map decisions spatially and conceptually
- EU water framework directive doesn't address source control
- Importance of historical sediments in the landscape, the risk in mobilisation particularly if contaminated (legacy risk), and the need to consider time-scales
- Inventory of decision-making guidelines required
- Which working group is responsible for decision-making – WG6 or 4? Important topic that needs to be covered. Need to work together with WG6
- The title of WG4 doesn't adequately match the content – the WG actually covers technical issues such as source identification, transport modelling and prediction as well as decision-making.
- Need for catchment or river basin scale approaches to management
- Need to link sediment management to EU water framework directive and soil communication

Following discussions during the workshop these conclusions were made:

- The need to reinstate what the specific role of WG4 is in SedNet; The WG4 is part-technical as well as socio-economic and wishes to retain the technical elements such as source identification and modelling, which are not covered in other working groups and are necessary to provide the river basin approach for decision-making and management
- Decision making is a key element for this working group and will be progressed in collaboration with WG6
- The title of the working group will be added to in order to more accurately reflect the scope of our work – WG4 'Planning and decision-making – *Opportunities for river basin planning of sediment management*'. This addition will cover more accurately the issues considered to be part of the WG4 remit, including the spatial management of both the

quantity and quality of sediment movement at an appropriate scale (i.e. the river basin) and the tools and techniques necessary to achieve sediment management (modelling and monitoring).

– Central to the philosophy and operation as a working group is river basin or catchment context for planning, decision-making and management of sediments

6.3. Organisation of WG

It is proposed that the participants present at this meeting will also help to guide the evolution and progress of the WG.

6.4. Next WG meetings

Workshops 1 - 4

Provisional titles and scope were established for the four workshops:

1. Opportunities for river basin planning of sediment management: existing guidelines and the EU framework directives
2. Sources and transfer of sediments and contaminants in the river basin (including legacy)
3. Modelling as a decision making tool
4. Decision making in sediment management – *following discussions with WG6 may be held in conjunction with WG6*

Workshop 1

Workshop 1: opportunities for river basin planning of sediment management: existing guidelines and the EU Framework directives

Dates and logistics

A one-day workshop spread over two days will be organised allowing participants to arrive and depart at convenient times. Participants will arrive on Monday 28th October a.m. and the workshop will begin p.m. with a series of keynote speeches each followed by group discussions. Monday evening a workshop dinner will be held with further opportunities to network. Tuesday 29th October a.m. will continue with further keynote speeches and group discussions on the issues arising from the keynotes (if there are more than 15 members - will split into smaller focus groups). Finally a workshop review session will wrap up the meeting. Members will depart Tuesday p.m. with the option of lunch before departure to local airports.

The workshop will be held at Cranfield University at Silsoe, Bedfordshire, UK. Members will have the opportunity to stay in the conference centre accommodation on site. It is recommended that members fly to London - Luton airport where the transfer by taxi to Silsoe is less than 30 minutes. Alternatively, the other London airports are within easy reach of Silsoe, Heathrow 1 ½ hours by train, Stansted 1 ½ hours by road and Gatwick no more than 2 hours transfer by train.

Proposed outputs from workshop

The following items are seen as important outputs that should result from the first workshop:

– A statement on how the water framework directive and other policies will present opportunities and change the way sediment is managed

– Problems of implementing the water framework directive for sediment management (i.e. practical problems such as including diffuse sources, monitoring and tools)

– Description of what sediments mean for the water framework directive – what is missing and the need for a sediment policy

– How tidal and fresh waters fit into the water framework directive in sediment management

6.5. Any other business

Actions to be taken

1. List of decisions that are made in sediment management – Sjoerd Hoornstra
2. List of stakeholders and decision makers – email to be circulated to all SedNet members – Alison Collins following completion of action 1
3. Inventory of existing national and international guidelines used in sediment management – Harald Koethe to compile initial list and Alison Collins to circulate by email to all SedNet members for completion
4. Prior to workshop to agree on definition of sediment – Alison Collins to email to working group members for email discussion
5. Working group members to agree on workshop 1 plans and to add any the details – all following report circulation by Alison Collins

7. WG 5: Risk management and communication

7.1. Objectives and program of first meeting

A maximum number of 25 people attended the workshop with some moving in and out throughout the discussions. 22 participants entered their names on a list which was frequently circulated and which is attached as Annex. A short statistic gives an overview over the countries that were represented.

Country	**No. of participants**
Belgium	4
Canada	1
France	2
Germany	4
Italy	3
Norway	1
The Netherlands	5
UK / (USA)	2

Three Participants regarded themselves as representing a problem owner, 14 a problem solver and four people belonged to institutions that where acting as owners as well as solvers of sediment-related problems (no entry for one person). Eight persons stated that they were interested in also joining further SedNet workshops on this issue, while the others were undecided.

During the short self-introduction a strong background in risk assessment techniques and sediment quality criteria and guidelines became apparent. Main interest in integration of risk assessment but also of legislative and communicative aspects into risk management procedures were mentioned.

The composition of the group provided a good basis for discussions. However we decided that it would be favourable to our goal, if we could persuade more people from Southern and Eastern Europe, preferably problem owners, to join this working group.

7.2. Key issues and concerns of WG

Key-issues

During the meeting it was agreed to concentrate upon the following key issues:

Risk Assessment

Risk assessment is regarded as a substantial part of risk management. In order to integrate it into RM (= risk management) procedures, requirements on risk assessment have to be formulated, i.e. the kind of information needed from risk assessment in order to carry out a sound risk management needs to be defined. However, WG5 is not a technical working group and as such will not go into detail regarding risk assessment techniques and methods – this will be an issue of communicating with the other (technical) working groups, especially WG 1 and WG2.

The need of a harmonised approach

The ideas regarding a harmonization of risk assessment procedures and sediment quality criteria will be encouraged and formulated, e.g. in form of a universal scaling, as this is going to enable management of transboundary rivers on a river basin scale tremendously.

The need of a flexible approach

On the socio-economic level, the recommendations for the management guideline should be flexible to account for the different economical and social situations in European countries.

Topics for the next workshop(s):

A strong need for clarification of words' meanings became apparent to be one of the first issues that this working group will have to deal with, in order to find a common basis of understanding:

- What are the goals that we are talking about? Are they perhaps country-specific?
- What kind of sediments is concerned? Dredged material? Accumulating sediments? Suspended material? Contaminated sediments? All?
- What is meant by "risk"? Is it the ecological, the manageable, the site-specific risk?
- What is understood by "sustainability" and how is it integrated into risk management procedures.

The scope of this working group comprises ecological, economical and societal aspects. Therefore what kind of information is needed from the different categories has to be clear: The tools in terms of information have to be specified that may be needed before any regulatory framework could be set up. This concerns the risk assessment procedure as well as

instruments of environmental policy. It is needed to discuss what is expected from a regulatory framework – where it should be strict and based on harmonised protocols, and where it has to be flexible – site-specific, country-specific.

In order to communicate recommendations for new risk management concepts the driving forces for political decisions have to be defined. The degree of public involvement will have to be debated and based on knowledge about awareness and interest in environmental problems.

Critical aspects

The inclusion of marine sediments into the scope of the working group was frequently raised. It was stated, that SedNet is oriented towards the Water Framework Directive, and therewith we will deal with estuaries and coastal zones, where a connection to river systems is concerned. This will also include a comparison of risk assessment and management procedures for freshwater and estuaries.

The problem of (contaminated) sediments touches several EU-regulations without being in the focus of any of them, such as the wastewater directive, the waste management regulation, the water framework directive, the habitats directive. Dredged material, which is regarded as waste independent of the degree of contamination, puts problem owners into an inflexible position. The complexity and severity of the sediment problems was proposed to justify a specific European approach to sediments.

7.3. Organisation of WG

Susanne Heise gave a short overview over the aims, the organisation and structure of the WG, the interactions between the different working groups, the expectations from the discussions of this Day 2 of the conference, and some aspects regarding risk management in Europe.

The aims of the working group were formulated as:

- Finding a common base of understanding between the participants
- Identification of deficiencies and problems (set up of a problem catalogue)
- Recommendations for EU topics
- Initiation of EU-projects
- Communication with other projects and networks
- Recommendations for a risk management procedure

The participants were informed that (at least) 4 workshops will be organised, which each will last for presumably 1.5 days. It would be appreciated if a core group of people is found that would frequently attend the workshops.

The preparation of white papers, sent to the participants well before the workshop was promised.

A SedNet-timetable demonstrated the frequency of meetings between the working group leaders (8 meetings in 3 years) and possible interactions between the workshops of the different working groups.

Expectations from discussions of this day were a revision of structure and organisation of the working group and the identification of urgent/necessary topics for research and communication in the field of risk management of sediments. The results would shape the items of discussion for the next workshop.

As an introduction to the topic, a short presentation on differences between selected European countries in terms of dredged material assessment and regarding the choice of instruments of environmental policy and the change of environmental strategies was given.

Sabine Apitz (Sea Environmental Decisions, UK), director of the "sediment management laboratory" in San Diego and at the moment on long-term assignment in the UK, gave a presentation, prepared by Beth Power and herself, over different sediment management frameworks and an analysis of the different factors of sediment management that are guided by different goals. She presented "lessons, learned from the North American experience", and suggested approaches for SedNet and the EU, which became part of the discussion. Sabine's presentation will be published in JSS, presumably volume 2 (2) 2002.

7.4. Next WG meetings

Workshops 1- 4

1. 1st WS: Location: Technical University Hamburg Harburg, September, 26th- 27th , 02; Title: "Problem formulation in Risk Management and Communication, Questions to Risk Assessment"
2. 2nd WS: Risk characterization and perception in Europe, Integration of socio-economic issues (Hamburg May 03)
3. 3rd WS: Applications of risk management/ Case studies (Venice or Prague, Sept. 03)
4. 4th WS: Synthesis of the meetings, final recommendations (Venice, early 04)

Workshop 1

The next workshop will be held in Hamburg at the Technical University Hamburg-Harburg on September 26th and 27th under the topic: "Problem formulation in Risk Management and Communication. Questions to Risk Assessment."

Program for the next workshops

It will be important to build up a common base of knowledge between all participants. Therefore it was regarded as important to prepare several white papers on the following topics well before the next meeting:

1) Legislative regulations: legislative regulations in Europe regarding sediment management need to be evaluated. Therefore a first white paper is concerned with the implementation of risk management procedures into (national) legislations
2) An overview over the implementation and current (and planned?) use of SQC will be prepared.
3) Information will be gathered regarding the degree of interest or kind of perception of sediment (or environmental) problems by the public in various European states.

In addition, it was suggested to prepare and continuously update maps, in which ecological and socio-economic data along river basins are depicted, which can then be used as a tool for management procedures.

In order to validate the outcomes of the first workshops regarding new aspects for risk management and communication, 3 to 4 river basins will be chosen as case studies for the 3rd workshop. These river basins should also include the Danube river, if the countries of this area agree.

In any case it was agreed upon the necessity to include more people from Eastern and Southern Europe in the working group in order to balance the current majority of Northern European participants.

7.5. Any other business

Expression of Interest

Integration of the following topics into the upcoming 6th framework programme were identified as important:

- Development of methods to balance information from different sources (groups/networks) or assessments/predictions with socio-economic factors in order to make decisions on the EU-level on possible actions, e.g. investment of money in upstream or downstream areas in a river catchment (WG6 issue?).
- Methods to establish communication (WG6 issue?)/ transmission of risk-based sediment management issues between European Countries.
- Methods for creating a river basin oriented database for a risk based sediment management.

8. WG 6: Financial and economic aspects

As mentioned in chapter 2, unfortunately Martin O'Connor, the leader of WG 6 was ill and, therefore, his presentation and his parallel WG session at day 2 of the conference had to be cancelled. However, Martin O 'Connor manage to send his idea's regarding his WG by e-mail, so that this information could be spread to the interested conference participants.

For this a short meeting was held during lunch break at the 2nd day of the conference. Thus conference participant were also given the opportunity to express their interest to participate in WG6 and already to come up with some suggestions for key-issues of concern to this WG. The list of people that showed up is presented in the annex.

Suggestions for issues to tackle in WG6 were:

- Strong link/cooperation/discussion with WG4 and WG5 is essential: who is going to tackle what and in what sequence (how can the WGs deliver input to each other and at the right time)
- Needed to develop, at river basin scale, a list of stake-holders / decision makers
- What type of decision is taken by whom?
- Description/analysis of decision making process needed
- What/whom is the critical factor in this?
- Definition of used terms is needed (speak each others language)
- How to move forward?
- Framework for problem owner concertation regarded as a very important issue
- In general people agree with Martin O'Connor's proposal: a) preparation of problem catalogue, b) review of analytical evaluation methods, c) development/validation of concertation framework, d) dissemination of results.

9. Appendix: WG participants

WG1: Site investigation and characterisation

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WG3: Sediment treatment

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WG4: Planning and deciscion making

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Jean Berlamont	Hydraulics Laboratory, University of Leuven	Jean.berlamont@bwk.kuleuven.ac.be	Professor of hydraulics interested in catchment scale modelling, uncertainty and inputs and sources of sediment
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Harald Koethe	Federal Institute of Hydrology, Germany	Koethe@bafg.de	Developing federal strategies and therefore interest in decision making
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Heinz Glindemann	Department of port and river engineering Hamburg	Heinz@glindemann.de	Engineer interested in identification of point sources of sediment and contaminants
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Per Òstlund	Studsvik Ecosafe, Sweden	Per.ostlund@studsvik.se	Geochemist with interest in sediment treatments and soil and sediment remediation
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John Quinton	National Soil Resources Institute, Cranfield University at Silsoe	j.quinton@cranfield.ac.uk	Soil scientist and erosion modeller interested in soil erosion and its control, assessment and prediction and the transport of contaminants
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WG5: Risk management and communication

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X	Eric Chauvet		Project Rivfunction		France	
X	Dr. Geza Jolankai		Tisza project		slovakia	
X	one or two representatives from the WWF-danube-carpathian programme					

tentative Statistics	approximately
PO	7
PS	7
Project coor.	4
Countries involved	9

WG6: Financial and economic aspects

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