Data handling in EU Flood Related Projects:

Past, Present and Future

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1. Introduction

In the future, new and ongoing projects under FP6 should build as much as possible on results of completed FP4 & FP5 projects and avoid repetition to ensure an optimal use of resources. One of the goals of ACTIF is to identify what has been done in the past, what is being done at the moment and what can be done to secure the future use of available data gathered during FP4 and FP5 and future FP6 projects on flood forecasting. Secondly, to give ideas/guidelines on how to achieve a workable way of collecting, storing and handling available data in flood forecasting projects in the EU for future use.

To achieve these goals a web-based questionnaire (Appendix A) has been sent to project coordinators of current and past EU flood related projects. Based on the answers of this questionnaires an overview of current and past practice has been obtained. The project coordinators also gave their opinion on how to secure collected data in the future. Below, the results of the questionnaire will be discussed starting with the past and present and closing with suggestions/possibilities of handling data in future for flood related projects.

An actual database with available data has not been built, but a list of EU projects linked with contacts for possible reuse of available has been compiled. Futhermore, conclusions and recommendations have been formulated.

2. Material and Methods

An internet accessible questionnaire was formulated (Appendix A). From May 2003-October 12 project coordinators were invited to fill out the questionnaire.

3. Results & Discussion

3.1. Past and present

The first part of the questionnaire was used to find out how projects evolve and what role data & data providers play in projects. Information about the various projects can be obtained from the websites listed in table 1. From these websites information on the project and often even the final report can be obtained.

Table 1. Overview of projects including website and point of contact

project	start date	end date	website	data available through
Carpe Diem	01-01-2003	31-12-2005	http://carpediem.ub.es/	project coordinator
Mantissa	01-02-2001	01-02-2004	http://prswww.essex.ac.uk/mantissa/index.html	project partners (see web site)
HERA	01-12-1996	01-02-1999	-	-

Floodman	01-02-2003	31-01-2006	http://www.itek.norut.no/projects/floodman	project coordinator
EFFS	01-03-2000	30-09-2003	http://effs.wldelft.nl	project coordinator
EURAINSAT	01-01-2001	31-12-2003	http://www.isac.cnr.it/~eurainsat/	Prof. Chris Kidd, School of Geography, Earth & Environmental Sciences, The University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK, c.kidd@bham.ac.uk
ShyLoc	01-11-1997	01-11-2000	http://poplar.sti.jrc.it/public/iain/shyloc/home.html	Julian Thompson (UCL), j.thompson@geography.ucl.ac.uk George Bilas (Greek Biotope Centre) : bilas@agro.auth.gr Delilah Al Khudhairy (JRC): delilah.al-khudhairy@jrc.it
MITCH	01-02-2001	01-07-2003	http://www.mitch-ec.net/links.htm	-
IMPACT	01-12-2001	01-12-2004	www.impact-project.net	-
TELFLOOD	??-??-1996	??-??-1998	-	hydrometric agency in country concerned
RIBAMOD	01-01-1997	31-12-1999	http://www.hrwallingford.co.uk/projects/RIBAMOD/	pilot study leader
EUROTAS	01-05-1996	31-10-1998	http://www.hrwallingford.co.uk/projects/EUROTAS/	N/A
MUSIC	??-??-2001	??-??-2004	http://www.geomin.unibo.it/orgv/hydro/music	Prof. Ezio Todini, University of Bologna
AFORISM	??-??-1991	??-??-1994	-	Prof. Ezio Todini, University of Bologna
NOAH	??-??-1997	??-??-2000	http://www.spotimage.com/accueil/appli/hazard/noah/welcome.htm	-

Relevant information on other projects (SIREN, MEFFE, SNOWTOOLS, HYDROMET, FLOODAWARE, FLOODGEN, SPHERE, COST, ECOFLOOD, RAPHAEL) was not provided, but may be found through the EU website (http://www.cordis.lu) and the ACTIF website (http://www.actif-ec.net/links.htm).

3.1.1.Project objectives and test sites

AFORISM

The Haute-Mentue catchment (12.5 Km2), located in the Swiss Plateau region some 20 Km north of Lausanne. In a first experimental period (1988-1991) the main objective for this catchment was to test land use effects on hydrological response. This was related to an effort to parameterize physically based models such as SHE on the basis of land use characteristics. The results were not conclusive. It was then decided that further work should concentrate on the role of the topographic factor. Consequently four forested sub-catchments (20-35 ha) with rather different topographic characteristics were monitored since 1992-1993. This experimental set-up allows a fairly objective evaluation of the role of topography. The Real Collobrier, a small catchment in France. The purpose of the experiments was the coupling, over the same catchment, between experiments and modelling for a better identification and understanding of flood runoff generating mechanisms. The Reno River in Italy (1081 km2) was used for (a) the analysis of the performances of different hydrological models from event types to continuous simulation ones and the selection of the most appropriate ones to be included in a comprehensive real-time flood forecasting system; (b) the choice of the most appropriate and robust flood 1-D routing models; (c) the study of the possibility of using real-time meteorological QPF as a forcing rainfall to hydrological models for real time flood forecasting.

Carpe Diem

Carpe diem is focused on the improvement of QPE and QPF using radar data for a flood forecasting system. Many case studies are therefore identified. Some of them concentrate on removing anaprop echoes from radar maps, while others are addressed to compare the different methodologies used to assimilate remote sensing data into numerical weather prediction models. Finally, some hydrological experiments will be done in Sweden and in Ireland to assess the usefulness of the techniques developed.

EFFS

The case studies are identified with the purpose of carrying out flood forecasts for different European basins by making use of weather forecast data. The basins are the river Rhine, the Elbe and the Po. Hindcasts are carried out, whereby numerical weather forecasts forming the archives are used to reproduce flooding events over the last years.

EURAINSAT

Several case studies were studied by the partners with the purpose of verifying the performance of various satellite rainfall estimation algorithms. Among them:

- Mesoscale Alpine Programme IOP-2 case (17-21 September 1999). Influence of orography on autumn precipitation in complex terrain over the Alps.

- Algiers flood (8-13 November 2001). Coastal flood with heavy rains and a challenging environment for the satellite rain algorithms given the land and sea surface simultaneous presence.

- Several dates of sustained but inconspicuous rains over the British Isles. Test of satellite rainfall algorithms in unfavourable light rain conditions.

- 17 March 1998. Rainfall episode over Eastern Mediterranean. Test of passive microwave and multispectral VIS-IR data synergy.

EUROTAS

Saar Catchment Study

1. Undertake integrated catchment modelling
2. Demonstrate flood risk assessment
3. Testing and application of river engineering and environmental change procedures
4. Testing and application of ICM and DSS

Thames Catchment Study

1. Undertake integrated catchment modelling
2. Assess effects on flood risk river engineering procedures
3. Examine land-use and climate change impacts upon flood risk

4. Testing and application of ICM and DSS

Pinios Catchment Study

1. Undertake integrated catchment modelling
2. Examine land-use and climate change impacts upon flood risk
3. Testing and application of procedures
4. Testing and application of ICM and DSS

Elbe Catchment Study

1. Undertake integrated catchment modelling
2. Examine land-use and climate change impacts upon flood risk
3. Testing and application of procedures
4. Testing and application of ICM and DSS

Liri-Garigliano Catchment Study

1. Undertake integrated catchment modelling
2. Flood risk and uncertainty assessment
3. Testing and application of procedures
4. Testing and application of ICM and DSS

<u>FLOODMAN</u>

Sub-objective 1: Develop improved methods for near-real time continuous monitoring of flood extent from EO data, in particular space borne radar data.

Sub-objective 2: Develop techniques and methods to utilise EO and in-situ data in distributed hydrological and hydraulic models.

Sub-objective 3: Develop a generic, distributed scalable prototype water management information system, which integrate information from EO data with in-situ data and model data.

Sub-objective 4: Validation and demonstration of the information system in operational environment.

The test areas identified in the project are:

Kemijoki, Finland, a an boreal forest drainage basin;

Rhine, Germany (from Maxau to Lobith);

Alessandria, Italy The test site of Alessandria is 40% flat agricultural area with mixed crops and residential areas, 40% hilly wine yards and 20% mountainous area. The area is located in Northwest Italy and is crossed by Po, Scrivia, Tanaro and Bormida rivers.

<u>FLOOD RELIEF</u>

Evaluate the developed improved technologies for flood forecasting through tests on two highly flood prone regional basins (Odra Catchment in Poland Welland and Glen Catchment in UK). These basins were selected because they include a wide range of flood producing storms and hydrological regimes over a broad spectrum of spatial and temporal scales.

HERA

HERA only considered the atmospheric part of the hydrological cycle.

IMPACT

There is a range of case studies within this project. Data is being collected via field case studies, field tests, laboratory physical modelling, and numerical modelling.

MANTISSA

1)To install dual frequency microwave links in order to measure line integrated attenuation through rain, and hence infer line integrated rainfall, over catchments in Germany, Italy and the UK.

(2) To develop a stochastic-deterministic rainfall-runoff model for use in these catchments to use link, raingauge and radar data.

MITCH

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MUSIC

Reno River (1081 km2) in Italy

Arno River (4080 km2) in Italy

Maggia (Ticino) (926 km2) in Switzerland

Vistula (296.7 km2) in Poland

The objective is to test the new MUSIC prototype for real time flood forecasting, which combines raingauges, RADAR and METEOSAT to produce an unbiased minimum variance precipitation input to a distributed hydrological model (TOPKAPI).

<u>NOAH</u>

The Mosel basin was the major case study, in order to provide operational services with a flood management methodology using EOD

<u>RIBAMOD</u>

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<u>SHYLOC</u>

Four case studies: 2 in Greece and 2 in UK.

First objective was to set up a hydrological model for two sites: a former wetland in Karla, Greece, and a managed wetland in the N Kent Marshes, UK.

Second objective was to develop a remote-sensing based software to measure wet width of ditches and streams.

Third objective was to develop statistical relationships between satelite-derived wet ditch width and groun-based measurements of ditch water levels and to use these to estimate, using archived satellite images, historical hydrological conditions in wetlands.

Fourth objective was to identify the limits of using standard hydrological models for modelling wetland hydrology and to modify them accordingly within the time frame of the project and thereafter by Danish Hydraulic institute who thereafter proceeded with developing a wetland hydrological model based on the results of SHYLOC.

<u>TELFLOOD</u>

1. Dargle catchment (Ireland) Comparison and assessment of various types hydrological models.

2. Reno catchment (Italy). Utility of radar information on precipitation

3. Various catchments in Sweden (Pepparforsen, Stadarforsen, Eman, Indalsalven, Tanemolla, Holjies, Gavunda) Evaluating use of rainfall forecasting with HIRLAM together with hydrological model (HBV)

Most of the projects have well defined objectives. Despite or maybe because of these well defined objectives most projects claim that although research is conducted on specific sites the research is generic in nature. Developed techniques and skills are or should be site independent. Some test sites were chosen because of previous work (modelling and availability of measurements) on these sites. Some test sites were chosen to represent specific behavior or to cover a wide spectrum of catchments.

3.1.2 Data Needs

-At the start of a project a clear picture of what kind of data is necessary exists. During the course of the project hardly any changes are necessary, although reviews are conducted regularly. In some projects not enough data was gathered.

-A variety of data is used and foreseen to be necessary :radar data-, satellite data-, standard hydrological and meteorological data, rainfall rates, DEMS and digitized drainage networks, geomorphology data., climate scenarios, numerical weather forecasts

-A variety of data is collected during the project itself.

3.1.3.Data Provision

Most of the data was provided by project partners and water authorities, or collected during the project. Satellite and remote sensing data are often obtained from data providers, such as space agencies and meteorological agencies. Remote sensing data can be costly, but in most cases the data providers are project partners. A lot of these data is only available for the project itself and cannot be used afterwards (protected by copyrights and licenses for instance DEMs, remote sensing data, numerical weather forecasts, etc). The nature of the research might prohibit data owners to hand over data because they fear public awareness.

3.1.4. Data Management

Data is easily distributed between project partners often through the internet or anonymous ftp. Responsibility for post project data management is not or hardly organized. Although data can or may be reused, this has only happened in a very few cases and only a limited amount of data was reused. Very few projects have a project database but in most cases the individual project members are responsible for the storage of data. Several project have stored the data on CDrom, but there are also examples of not storing the data at all. Most of the collected data was validated in one way or the other. In most cases both the validated data and the raw data are available. Information on conditions under which the data were collected is available for about half of the projects. In all projects the quality of the collected and available data is valued as good. Data from the HERA project are partly available through the MAP data centre (http://www.map2.ethz.ch/index.htm).

3.2. Future Scenarios

To obtain a clear picture of possible future ways of handling and storing data a handful of scenarios were provided. Additionally, the project coordinators could propose their own ideal fifth scenario. Below we will describe the 4 scenarios followed by an analysis of the results

Scenario 1 Business as usual

Projects are carried out as before. The final document and available project reports make it possible for people to contact other project coordinators for available data.

Scenario 2 Identifying EU-test sites

A few experimental sites (catchments) across Europe are selected. All research will focus on these selected sites. This will optimize the use of available data and resources.

Scenario 3 Setting up an EU-wide database

All data obtained during (past, present and future) projects will be collected in an EU-database (for instance physically located at JRC or another institute). The data will be stored in easy accessible standardized formats. This data can be accessed and downloaded by future project participants through internet.

Scenario 4 Specific requirements

Instead of creating a EU-database, each awarded project has to comply to predefined guidelines on how collected data should be stored, handled, and made available after the project has finished. This will enhance uniformity of data storage and consequently enhance the re-use of collected data.

Scenario 5 ?

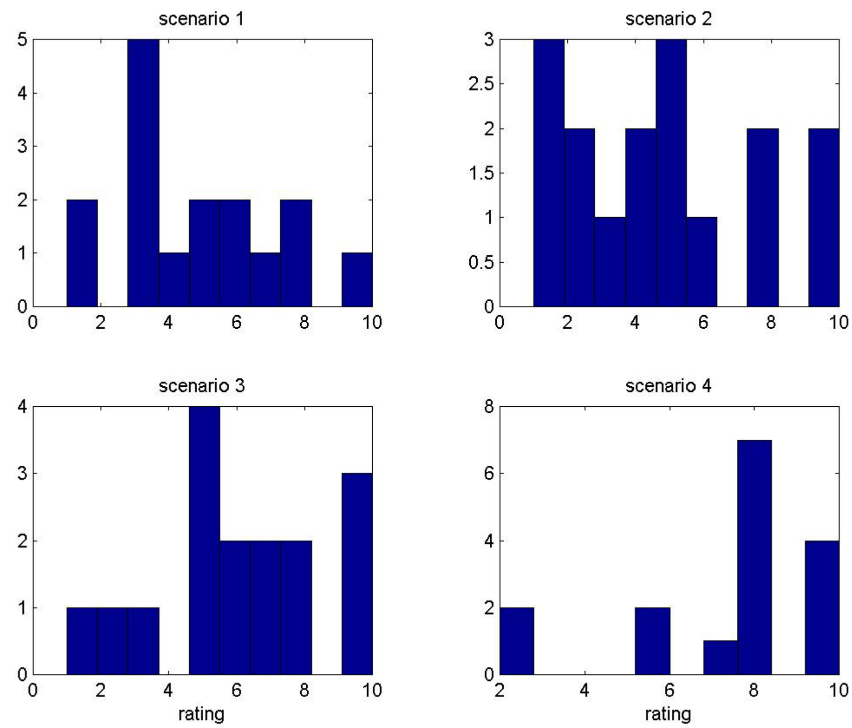

Figure 1. Histograms of the ratings of the 4 scenarios.

Table 1. Statistics of the ratings for scenario 1-4.

Table 1. Statistics of the ratings for scenario 1-4. scenario	Mean	std	Median
1	4.75	2.59	4.5
2	4.69	3.05	4.5
3	6.13	2.73	6
4	7.44	2.48	8

Figure 1 shows the 4 histograms of the ratings obtained through the questionnaire. Table 1 shows the mean, median and the standard deviations of the four scenarios. It is clear that scenario 1 and 2 are rated as the worst scenarios followed by scenario 3. Scenario 4 is rated as the best scenarios. Many coordinators mention that not all the data can be stored. For instance, the data obtained under licenses or protected by copy rights. Proposed as Scenario 5 is often a blend of scenario 3 and 4 and even a blend of 1 and 4 is proposed.

Comments scenario 1: Continuing "business as usual" would be bad practice. It leads to fragmentation and loss of data. It is, however, the simplest alternative and no additional costs are required. A lot of time, financial resources and energy is lost in finding and retrieving data at the beginning of the project. There is no real commitment to sharing the data after a project is finalized. The data providers retain ownership of their data. Data has a value that cannot be ignored. Data is being lost or not used to the maximum value. Project leaders can leave their institutes and hence knowledge departs with main person who knows where and how data are stored. Lack of resources and mandate to maintain database of past projects.

Comments scenario 2: too restrictive. There will always be situations not covered by a limited number of research catchments. They will yield useful high quality data in specific areas. Efforts can be concentrated on catchments were the quality of data allows for meaningful comparisons of techniques to be tested. The identification and setup could become protracted, and objectives made too broad. In attempting to address all issues on a few sites, the management of wide ranging projects becomes onerous. It is very difficult to agree on specific sites. Provided EU funding is available for baseline instruments, this will provide excellent facilities for future research. This unnecessarily confines work to specific locations. Inflexible approach. A few "dedicated" test sites is excellent for scientists, but makes it difficult to get real end-user involvement. Different methodologies could be compared on a standard set of data.. It is important to test methodologies on local conditions, so this approach could be restrictive in this sense.

<u>Comments Scenario 3</u>: Hardly acceptable by many organisations. Not all the data can be made available.. Optimal solution. Optimizes time and energy. This is a good idea and would greatly simplify the job of storing data from the projects. One should work towards making all data available to everyone, However, it would be difficult to control the origin and quality of the data. Centralized systems are the past, distributed belong to the future. This data must belong to the data providers and not EU. Good data is a project partner asset. A good idea providing that the system can be sufficiently flexible to cover all types of project data.. Difficulty of agreeing formats, but could be an excellent resource. It would be useful to have a comprehensive database. However, the issues of management and updating are considerable. Experience of EU collaboraive projects shows that as much if not more effort is spent on management and administration as on science. It requires a good quantity of work and most of the time, if the updating is not maintained, many difficulties may arise in the extraction of stored data. Will need a long-term commitment by the EC and the reason for the EC doing this in terms of cost-benefit appraisal are not clear. Data are

accessible for all communities to use assuring cost effectiveness of past EU funded EU projects. Avoids collection of data that are already available anyway. Would be very advantageous if the E-wide database includes results from all EU-funded projects. Who will pay and decide who should host the EU-based database.? Copyright of certain data such as remote sensing. Good but difficult to implement and to maintain. However some good worldwide experience has shown its possible, cf. Met services exchange of information

Comments Scenario 4: Not all the data can be made available. Standardisation. Reduction of workload to use the data. Increase in the workload to prepare project database. Good idea, but implies additional work within projects, that many teams are most probably not prepared to invest This is as good as scenario 3, but there would be no problems with specific fundings. A distributed system where the data owners are responsible for maintaining, updating, and sharing the data would be the ideal solution. Web technologies, and data exchange standards makes this solution more feasible than ever. This data must belong to the data providers and not EU. Good data is a project partner asset. This is the best approach. Give guidance to coordinators on how to collate, store and reference data but retain the freedom to store data with host organisations. Organisations can then also see who is wanting to use the data and why. Some groups will not comply; databases will not be maintained locally This would have some of the advantages of scenario 3, without its major administrative drawbacks. It would mean that results from individual projects would be more amenable to transfer and post-project uptake. Can link to nationally funded research programmes. Good link between data archivers and the data user. Potentially difficult to agree on "universal" standards for all data types. Will need some long term commitment to a data "warehouse" in each organisation - will require funding. Data quality and standards are assured and this facilitates use by other communities and integration in EU-based database. Good as a general requirement for funded projects. Enforcement must be considered, quality of data assured (international standards etc.) and results integrated into scenario 3.

4. Conclusions

Although data transfer within a project works well, continuing current practice implies that a good deal of data will be lost. As mentioned by various project coordinators there is no commitment or requirement for providing data after a project is finished. Secondly, project coordinators switch jobs and consequently the data availability is endangered. Both these points, raised by project coordinators, became very clear while evaluating the questionnaire. The vast majority of project coordinators feel that continuing as in the present is counter productive.

Identifying various test sites over Europe is being regarded as too restrictive. Maybe the most important drawback of such a policy is that it makes real end-user involvement difficult or even impossible. However, it can be noted that many projects are investigating the same theme: Radar/Remote sensing – QPF – flood/hydrology. And because all the project claim to carry out generic research, it can be argued that identifying one or two EU test catchments/sites would be cost effective. Moreover, It would be good for science. So, identifying one or two catchments as reference catchments which should be included, beside specific catchments, in most or each future project might be a good idea.

Setting up a EU database for flood related data is found to be a good idea that may optimize energy and money. However, it needs several boundary conditions and hard commitments like controlling origin and quality of data, one format (for instance in XML), long term commitment of the EU etc. It is argued that it would be (politically) unacceptable by many organizations and that data is an asset. However some good worldwide experience has shown it is possible, cf. Met services exchange of information.

Each funded project has to comply to predefined guidelines on how collected data should be stored, handled, and made available after the project has finished: this is the preferred option of most project coordinators. It has the advantages and not the bureaucratic burden of scenario 3,. A distributed system where the data owners are responsible for maintaining, updating, and sharing the data would be the ideal solution. Web technologies, and data exchange standards make this solution more feasible than ever. It will be good as a general requirement for funded projects, and enforcement must be taken seriously. The quality of data must be assured (international standards). Of course, this requires extra funding in the short term, but will pay itself back on the long term (both for the EU as for the project participants themselves).

Appendix A Web-Based Questionnaire

ACTIF Questionnaire

Data collection, handling and use for flood forecasting in the EU: Past, Present and the Future

Background

In the future, new and ongoing projects under FP6 should build as much as possible on results of completed FP4 & FP5 projects and avoid repetition to ensure an optimal use of resources. Therefore, as part of ACTIF (FP5) in work package 8, an effort will be made to prepare a document on data handling, collection, distribution and use in flood forecasting of finished and ongoing FP4 and FP5 projects that will benefit future (FP6) projects. The goal of this work package will be to identify what has been done in the past, what is being done at the moment and what can be done to secure the future use of available data gathered during FP4 and FP5 and future FP6 projects on flood forecasting. Secondly, to give ideas/guidelines how to achieve a workable way of collecting, storing and handling of available data in flood forecasting projects in the EU for future use. An actual database with available data will not be build, but the idea is to compile a list of available data linked with projects and contacts. The responsibility for such a list with available data, as complete as possible, lies with the project coordinators of finished and ongoing FP4 and FP5 projects that will

be consulted through a questionnaire. This questionnaire will consist of three parts. The first part will be focus on the role of data providers in the projects, experience with data providers, data distribution within the project, data accessibility after the project, conditions for use, copyright protection, costs etc. Secondly, the questionnaire will focus on technical issues such as data type, methods of detection, data storage, handling, data quality, and data sources. Finally, attention will focus on how project coordinators foresee how collected data can be made available to other future projects using a few scenarios.

Can you please fill out this questionairre and send it back before September 1 2003?

contents of questionnaire

Part 1 Past experience

Project data

Data needs

Provision of data

Data management

reuse of data

Part 2 Technical information

Part 3 Future scenarios

Part 1 Past experience

Project data

1. What is the name of your project?

2. When did it start and when was it finished or is it still ongoing?

start date | final date

3. Do you have a reference to a website?

4. Which were the case studies and their objectives?

Data needs

5. Before the project started, what kind of data was foreseen to be necessary to successfully finish the project?

6. During the project, was there an evaluation if it was really necessary to obtain specific data to meet the final goals of the project?

7. In the end, was all data that was collected and was foreseen to be necessary, used to successfully finish the project?

8. What kind of data was used during the project?

Provision of data

9. Who provided the data in the project? Was data collected during the project?

10. Was data easily provided by the data providers? At what costs?

11. What was the role of the data providers in the project?

12. Restictions and conditions set by providers? Where the data provided under certain conditions (for instance copy right etc.)?

13. Field measurements specifically for project?

Data management

14. Was data collected and handled during the project passed on to other (future) projects or used again after the project had been finished? Is all of the data collected during the project described in the final report?

15. Can you specify who is/was responsible for post-project distribution of the data?

16. Was the data easily distributed within the project between project partners?

17. Was data re-used in other (also non EU) projects?

18. Was the data published in scientific literature?

Reuse of data

19. How site specific was the research that was carried out?

20. On what basis where experimental sites chosen in the research proposal?

21. On what basis can the data be re-used?

Part 2 Technical information

22. How are/was the data stored? Project database or database per partner?

23. What formats are being used or have been used to store the data?

24. What detection/measurement methods have been used in the project?

25. How is the quality of the data?

26. How is the data stored momentarily?

27. Where is the data located at the moment?

28. Who is responsible and can be contacted to obtain the collected data?

29. Is the data readily available for use in other projects?

30. Is information available on where, who and under which specific circumstances the data was collected?

31. Are both raw and processed (validated) data stored and available?

32. Was the data validated? And if so which methods were used?

Part 3 Future Scenarios

Below 4 scenarios are described. Can you specify your thoughts on each of the scenarios?

Scenario 1 Business as usual

Projects are carried out as before. The final document and available project reports make it possible for people to contact other project coordinators for available data.

Scenario 2 Identifying EU-test sites

A few experimental sites (catchments) across Europe are selected. All research will focus on these selected sites. This will optimize the use of available data and resources.

Scenario 3 Setting up an EU-wide database

All data obtained during (past, present and future) projects will be collected in an EU-database (for instance physically located at JRC or another institute). The data will be stored in easy accessible standardized formats. This data can be accessed and downloaded by future project participants through internet.

Scenario 4 Specific requirements

Instead of creating a EU-database, each awarded project has to comply to predefined guidelines how collected data should be stored, handled, and be made available after the project has finished. This will enhance uniformity of data storage and consequently enhance the re-use of collected data.

Scenario 5 ?

On the scale of 1 (bad) - 10 (good)

34. How do you rate Scenario 1?

35. How do you rate Scenario 2?

36. How do you rate Scenario 3?

37. How do you rate Scenario 4?

38. What are in your opinion the advantages and drawbacks of Scenario 1?

39. What are in your opinion the advantages and drawbacks of Scenario 2?

40. What are in your opinion the advantages and drawbacks of Scenario 3?

41. What are in your opinion the advantages and drawbacks of Scenario 4?

42. Can you add your own favorite scenario 5, taking into consideration that future FP6 projects should avoid repetition and use available resources optimally?

43. Finally, What are your thoughts on re-use of collected data in future projects? Do you really foresee this can effectively be organized?

Send Clear

Thank you for filling out this questionnaire!

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