RAPORT DE ANALIZA PRIVIND POTENTIALUL TEHNIC SI STIINTIFIC EXISTENT IN REGIUNEA DUNARII, RELEVANT PENTRU MANAGEMENTUL INTEGRAT AL SISTEMELOR FLUVIU – DELTA – MARE

Pachet de Lucru # 2

Analiza potentialului tehnic si stiintific existent in Regiunea Dunarii, relevant pentru managementul integrat al sistemelor fluviu – delta – mare

Autori: **GEOECOMAR**
INSB
FM Management Consultancy SRL
GEA Strategy & Consulting SA

Experti: *Dr. Adrian Stănică*
Dr. Manuela Sidoroff
Dr. Simona Lițescu
Dr. Mihaela Păun
Mădălin Ioniță
Lavinia Cioară
Virgil Dinulescu
Dana Bețliu
Flaviana Rotaru
Dragoș Pîslaru
Adriana Constantinescu
Tanislav Manta
Albert Scrieciu
Bogdan Alexandrescu

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CUPRINS

1. INTRODUCERE

Acest raport are ca scop principal realizarea unei analize detaliate a potențialului de cercetare tehnico-ştiinţific existent in Regiunea Dunării, relevant pentru managementul integrat al sistemelor de tip fluviu-deltă-mare (FDM).

Centrul Internaţional pentru Studii Dunare- Delta Dunării - Marea Neagra (*DANUBIUS - RI)* va fi propus pentru a fi inclus pe viitoarea foaie de parcurs ESFRI ca infrastructura de cercetare majoră pan-europeană în domeniul managementului integrat al sistemelor de tip fluviu-deltă-mare, cu accent pe macrosistemul Dunăre-Marea Neagră. Propunerea DANUBIUS-RI va trebui depusa în cadrul următoarei competiţii de proiecte pentru următoarea foaie de parcurs a ESFRI (apel asteptat pentru următoarea competitie ESFRI - in prima jumătate a anului 2014).

Se prevede ca DANUBIUS – RI să cuprindă un Nucleu în Delta Dunării – având rolul de centru de comandă şi un rol major ca infrastructura de cercetare (transformând delta intr-un „laborator natural"), precum şi o serie de Noduri în Europa. Noul Centru va contribui la cercetarea mediului si va promova inovarea in regiunea extinsa a Dunării, inclusiv Delta Dunării si Marea Neagra. Aceste noduri vor da DANUBIUS-RI un caracter de infrastructura distribuita si vor avea o contribuţie suplimentară în structura proiectului, dat fiind faptul că vor aduce împreuna facilităţi de cercetare angajate în procese şi metodologii de cercetare din întreaga Europă. Vor fi astfel aduse împreună ca noduri ale unei infrastructuri distribuite, cu nucleul central in Delta Dunării, facilitati de cercetare de excelenta in diferitele problematici ale sistemelor FDM.

Misiunea centrului DANUBIUS-RI va fi aceea de a furniza soluţii ştiinţifice inovative, ca răspuns la principalele provocări globale din domeniu şi de a stabili cadrul pentru dezvoltarea durabilă a sistemului Dunăre – Delta Dunării – Marea Neagră, ca bună practică pentru sistemele majore de tip fluviu-deltă-mare la nivel mondial.

În cadrul procesului de pregătire, România – în calitate de iniţiator al DANUBIUS - RI – necesită sprijinul celorlalte State Membre ale UE, atât din interiorul, cât şi din exteriorul Regiunii Dunării. Ţările care se vor alătura consorţiului DANUBIUS - RI vor fi selectate pe baza comunităţilor de cercetare puternice de care dispun, capabile să contribuie în mod substanţial la dezvoltarea proiectului. Un element important de reţinut în acest demers constă în nevoia de a dezvolta DANUBIUS-RI ca infrastructură de cercetare distribuită în accepţia ESFRI şi nu ca o reţea de infrastructuri de cercetare– toate acestea abordând aceleaşi teme – deoarece în acest caz ar putea fi asociată cu o „Iniţiativă de Infrastructuri Integrate" (I3). O eventuală confuzie din acest punct de vedere ar putea conduce la respingerea DANUBIUS-RI în cadrul viitoarei Foi de parcurs a ESFRI.

Obiectivul final al DANUBIUS - RI este de a deveni şi funcţiona ca Infrastructura de Cercetare pan-europeană Distribuită cu acces deschis şi de a deveni „ERIC (European Research Infrastructure Consortium - Consorţiu pentru o infrastructură europeană de cercetare)" din punct de vedere juridic.

Pentru a îndeplini aceste obiective, DANUBIUS-RI va numi o echipă de management la nivel internaţional, va avea un *Consiliu Ştiinţific* şi un *Consiliu General* internaţional, cu participarea tuturor asociaţilor.

Prin Strategia Uniunii Europene pentru Regiunea Dunării (SUERD), DANUBIUS-RI a primit statutul de *Proiect Fanion* în cadrul Domeniului Prioritar 7 „Societatea Bazată pe Cunoaştere" a SUERD (2 octombrie 2013). La nivel naţional, Guvernul României a considerat demersul de dezvoltare a DANUBIUS - RI şi a Nucleului său din Delta Dunării drept un Proiect Major de Infrastructură de Cercetare, permiţând finanţarea prin fonduri publice naţionale şi structurale în perioada de programare 2014-2020.

2. METODOLOGICA APLICATĂ

Realizarea raportului de analiză privind potenţialul de cercetare tehnico-stiinţific existent în Regiunea Dunării, relevant pentru managementul integrat al sistemelor de tip fluviu-deltă-mare, a necesitat o componentă esenţială de cercetare susţinută.

În vederea îndeplinirii obiectivelor raportului, Consorţiul a aplicat mai multe instrumente de cercetare, precum analiza documentară (literatura de specialitate relevantă, documente oficiale şi resurse de pe internet), sondaje în rândul celor mai importanţi actori implicaţi, întâlniri de tip atelier cu experţi din comunitatea ştiinţifică şi cea de afaceri, schimburi de idei între membrii Consorţiului.

Pe parcursul acestui demers, cercetarea a fost structurată în *5 etape*:

Etapa I: Cercetare documentară a datelor existente

În cadrul acestui proces, Consorţiul a abordat un volum semnificativ de studii descriptive şi de explorare cu privire la infrastructurile şi proiectele de cercetare existente în *Regiunea Dunării*, ce abordează potenţialul existent în materie de infrastructură de cercetare, agendă ştiinţifică şi instruire. Versiunea actuală a raportului se referă la potenţialul tehnico-stiinţific din partea cursului mijlociu si inferior al Regiunii Dunării, inclusiv Delta Dunării, zona costiera si platforma continentala din vestul Mării Negre, aflate sub influenţa fluviului, în timp ce versiunea finală va trata şi porţiunea centrală şi superioară a Regiunii Dunării.

Analiza documentară a implicat realizarea următoarelor activităţi: informare asupra proiectului pentru toţi membrii echipei, identificarea surselor de informaţii, colectarea şi procesarea datelor, completarea fişelor de date privind infrastructura cu referire la aspectele mai sus menţionate, interpretarea şi analiza datelor.

Sursele utilizate în vederea colectării informaţiilor au constat din: versiunea actualizată a Cărţii Albe, Cartea Albastră (dezvoltata in cadrul acestei faze), resursele internet ale infrastructurilor de cercetare şi programelor existente, rapoarte oficiale publicate pe pagina de internet a Comisiei Europene şi domeniul ESFRI, studii şi rapoarte realizate de către membrii Consorţiului în cadrul altor proiecte (FP7 DANCERS), informaţii furnizate în mod direct de către toţii partenerii din consorţiul DANUBIUS-RI.

Esantionul de date folosit pentru analiza in acest raport provine din rezultatele obtinute de proiectul FP7 DANCERS (coordonat de GeoEcoMar şi având INSB în calitate de partener), date care pot fi accesate din

baza de date creata in cadrul proiectului si care este gazduita pe serverul Universitatii Wasser Cluster Lunz. Baza de date este active si se poate accesa la adresa http://wcl-geo.boku.ac.at/geonetwork/srv/eng/search . Analiza care este prezentata in Sectiunea 5.2 consta dintr-o parte de analiza descriptiva in care variabilele de interes, cum ar fi tipul de finantare, statutul proiectului, aria tematica, tipul de program sunt investigate din punct de vedere cantitativ, iar rezultatele sunt prezentate grafic.

Cea de-a doua parte a analizei prezinta o investigare inferentiala, testeaza ipoteze statistice si efectueaza analiza temporala preliminara a datelor. De exemplu, este testata ipoteza de independenta a variabilelor ariilor tematice ale proiectelor folosind testul Chi-square de independenta. Tabele de contingenta afisand distributia frecventelor variabilelor analizate sunt prezentate si folosite pentru teste statistice care investigheaza relatiile dintre variabile. Analiza presentata in sectiunea 5.2 este obtinuta folosind pachetul statistic R.

Etapa a II-a: Cercetare cantitativă (sondaj)

În vederea completării rezultatelor cercetării cantitative, s-a optat şi pentru realizarea unui sondaj calitativ în rândul celor mai importanţi actori implicaţi (oameni de ştiinţă, factori de decizie şi responsabili de formularea politicilor, comunitatea de afaceri), inclusiv participanţii la atelierele organizate de către partenerii din Consorţiu, în contextul acţiunilor întreprinse pentru dezvoltarea propunerii DANUBIUS - RI pentru ESFRI.

Echipa Consorţiului a dezvoltat *trei seturi de chestionare*, acoperind o *arie largă de teme* ce vor *furniza informaţii importante nu doar pentru evaluarea potenţialului tehnico-ştiinţific existent în Regiunea Dunării – relevant pentru managementul integrat al sistemelor de tip fluviu-deltă-mare – ci şi în vederea înfiinţării şi operării viitorului centru DANUBIUS-RI*: potenţialul de cercetare existent în Regiunea Dunării şi domeniile care necesită îmbunătăţiri (infrastructură, agendă ştiinţifică), prioritizarea temelor de cercetare ştiinţifică de abordat în cadrul noii infrastructuri de cercetare în contextul Orizont 2020 (prioritizarea temelor referitoare la Provocările Sociale existente, cu relevanţă pentru DANUBIUS-RI), tipuri de programe de învăţământ comune care vor putea fi oferite de noua infrastructură de cercetare etc.

Chestionarele au utilizat, în mod sistematic, seturi de răspunsuri predefinite şi este de aşteptat ca informaţiile colectate să furnizeze o descriere complexă a convingerilor, opiniilor şi cunoştinţelor actorilor majori implicaţi. 40 de chestionare din partea comunităţii ştiinţifice şi celei de afaceri. Întrebările au fost dezvoltate pe baza provocărilor din domeniul gestionării apelor, în contextul Orizont 2020, şi sunt anexate prezentului raport.

Întrebările formulate acoperă o arie largă de subiecte cu privire la potenţialul existent în Regiunea Dunării, dar şi cu privire la nevoile de dezvoltare ulterioare de tratat în cadrul DANUBIUS - RI:

- necesitatea unei noi infrastructuri de cercetare distribuite la nivel pan-european, având Nucleul în Regiunea Dunării, dedicate managementului integrat al sistemelor de tip fluviu-deltă-mare;

- principalele priorităţi ale activităţilor ce vor fi desfăşurate în cadrul noii infrastructuri de cercetare (şi anume, educaţie, cercetare de bază, cercetare/tehnologie aplicată, inovare, colectare de date şi observaţii, servicii de consultanţă privind reglementarea politicilor);
- lista prioritizată de teme de cercetare privind macrosistemul Dunăre – Delta Dunării – Marea Neagră, necesare în vederea dezvoltării ulterioare a infrastructurii de cercetare din Regiunea Dunării;
- potenţialul de cercetare existent în Regiunea Dunării (laboratoare, programe, proiecte şi iniţiative) şi domeniile care necesită expertiză din alte regiuni;
- agenda de cercetare existentă în Regiunea Dunării şi nevoile de dezvoltare ulterioară în domeniul managementului integrat al sistemelor de tip fluviu-deltă-mare (este dezvoltată şi implementată la momentul actual o abordare la nivel de macrosistem?; constituie abordarea la nivel de macrosistem o soluţie pentru succesul managementului integrat al aspectelor privind regiunea Dunăre-Delta Dunării-Marea Neagră?; studii multidisciplinare versus cercetare sectorială?; este necesară o mai bună integrare şi dezvoltare a cercetării multi- şi pluri-disciplinare din Regiunea Dunării?; care este nivelul actual al calităţii cercetării de mediu din regiune?; este cercetarea actuală privind navigabilitatea în regiunea Dunăre-Marea Neagră la un nivel corespunzător de dezvoltare şi eficienţă şi rezolvă aceasta problemele de navigaţie?; este cercetarea actuală privind riscurile naturale din regiunea Dunăre-Marea Neagră la un nivel corespunzător de dezvoltare şi eficienţă şi acoperă aceasta aspectele legate de prevenirea efectelor aferente?; este cercetarea actuală privind calitatea apei pentru diverse utilizări în regiunea Dunăre-Marea Neagră la un nivel corespunzător de dezvoltare şi eficienţă? Este necesară o mai bună dezvoltare a cercetării privind calitatea apei pentru diverse utilizări?);
- centrele existente de învățământ superior specializat din Regiunea Dunării şi nevoile de dezvoltare ulterioară în domeniul managementului integrat al sistemelor de tip fluviu-deltă-mare (existenţa unor programe dedicate de învăţământ superior, diferite de cursurile universitare, care să abordeze soluţiile pentru problemele de gestionare a apelor din Macroregiunea Dunăre-Marea Neagră, şi necesitatea unor astfel de programe în Regiunea Dunării);
- infrastructurile de cercetare din Regiunea Dunării (sunt infrastructurile existente de cercetare şi inovare corespunzător dezvoltate şi coordonate în regiunea Dunăre-Marea Neagră şi este necesară la momentul actual o astfel de infrastructură distribuită la nivelul regiunii?);

- aspectele privind parteneriatele dintre instituţiile de învăţământ şi capacitatea acestora de a îmbina expertiza de cercetare şi cea de predare, îmbunătăţind calitatea studiilor oferite studenţilor şi permiţând, în ultimă instanţă, dezvoltarea cunoştinţelor ştiinţifice (o prioritizare a parteneriatelor dintre instituţiile de învăţământ aflate pe agenda ştiinţifică a DANUBIUS-RI, o prioritizare a instituţiilor implicate în parteneriate în domeniul educaţiei în funcţie de localizarea lor geografică (Regiunea Dunării, alte ţări europene, nivel internaţional); aria geografică a domiciliului studenţilor care participă la cursurile din cadrul DANUBIUS-RI (Regiunea Dunării, alte ţări europene, nivel internaţional); tipuri de diplome/certificate oferite de programele de învăţământ comune ale DANUBIUS-RI (programe universitare comune, programe de masterat comune, programe doctorale comune, programe comune de certificare a cadrelor de conducere – de scurtă durată şi la un nivel ridicat de specializare, alte tipuri de diplome etc.); tipuri de activităţi de pregătire pentru carieră în cadrul programelor comune de învăţământ ale DANUBIUS-RI).

Etapa a III-a: 3 workshopuri cu experti din comunitatea stiintifica, reperezentanti ai mediului de afaceri si factori de decizie

În vederea completării informaţiilor menţionate anterior, partenerii din cadrul Consorţiului au organizat trei întâlniri tip atelier:

- un *atelier cu principalii experţi din comunitatea ştiinţifică (17 – 18 martie),* având ca scop analizarea cercetării specifice întreprinse până în prezent în Regiunea Dunării. Atelierul a abordat, de asemenea, Delta Dunării şi zona de nord-vest a Mării Negre, precum şi zona de coastă a acesteia, cu accent pe proiectele cu finanţare naţională, internaţională şi europeană din domeniul managementului integrat al sistemelor de tip fluviu-deltă-mare.
- un *atelier cu comunitatea de afaceri (19 – 20 martie)*, intitulat: „*Ştiinţă şi afaceri în domeniul gestionării apelor în Regiunea Dunării: idei noi pentru oportunităţi mai bune de afaceri*". Participanţii la acest atelier au fost invitaţi să descopere împreună modul în care ştiinţa poate răspunde mai bine nevoilor comunităţii de afaceri regionale, care sunt nevoile stringente la nivelul companiilor private, ce pot fi abordate prin idei inovatoare, precum şi acele acţiuni de realizat pentru a dezvolta în continuare Regiunea Dunării.
- *un atelier cu factori de decizie si politici (26-27 mai)*, intitulat: „*Suport stiintific in luarea de decizii in managementul apei din Regiunea Dunarii"*. Participantii la intalnire au fost invitati sa-si exprime opiniile despre situatia managementului apei in macroregiunea Dunare – Marea Neagra, despre posibilele contributii ale cercetarii in luarea de decizii in acest domeniu.

Minutele celor trei ateliere şi prezentările respective sunt incluse în prezentul raport, iar principalele constatări şi concluzii sunt sintetizate în secţiunea şase, "*Concluzii şi recomandări*". Atelierele au fost moderate de către Dr. Adrian Stanica (GeoEcoMar).

Lista participanţilor la ateliere a inclus reprezentanţi ai următoarelor organizaţii:

- ISMAR- CNR şi CORILA – Italia
- University College Cork – Irlanda
- IFREMER şi Universite de Lorraine, Metz – Franţa
- Hellenic Centre for Marine Research – Grecia
- Centrul National de Oceanografie din Southampton (NOC), Universitatea din Stirling şi Universitatea din Birmingham – Marea Britanie
- ZSI Vienna, Zentrum Fuer Soziale Innovation, WasserCluster Lunz Biologische Station GmbH – Austria
- UNESCO – IHE
- Universitatea Ecologică de Stat din Odessa - Ucraina
- Universitatea Szeczeni Istvan din Gyor, Aquaprofit, HydroInform, Institutul de Cercetare pentru Protectia Mediului si Managementul Apei – Ungaria
- Centrul de Cercetare a Mediului Costier, Universitatea Politehnică din Barcelona – Spania
- Univ. Geneva – Elveţia
- DELTARES – Olanda
- Apele Croate – Croatia
- Universitatea din Novi Sad, Directoratul pentru Ape Interioare, PLOVPUT – Serbia
- Agentia pentru Dezvoltare Durabila si Eurointegrare-ECOREGIONS, Remote Sensing Application Center – ReSAC, Institutul de Oceanologie – Academia de Ştiinţe din Bulgaria
- Centrul National de Mediu – Moldova
- FMMC, Gea Consulting, Marine Research Ltd., Institutul Naţional Delta Dunării, Universitatea din Bucureşti, INSB, GeoEcoMar, Institutul National de Hidrologie si Gospodarirea Apelor, Administratia Fluviala a Dunarii de Jos, Ministerul Mediului si Schimbarilor Climatice - România

Toate materialele de prezentare, precum şi minutele aferente celor trei evenimente menţionate mai sus au fost utilizate în elaborarea diferitelor secţiuni ale acestui raport.

Etapa a IV-a: Procesarea, analiza şi interpretarea datelor

În cadrul etapei de analiză şi procesare a datelor, informaţiile şi datele colectate din mai multe surse au fost procesate într-o manieră standardizată, folosind un set de criterii predefinite.

Consorţiul a dezvoltat o serie de instrumente de procesare şi interpretare a datelor. A fost dezvoltat un set de fişe de date privind infrastructurile şi programele, (a se consulta anexele), acoperind aspectele relevante referitoare la potenţialul tehnico-stiinţific existent în Regiunea Dunării, din perspectiva managementului integrat al sistemelor fluviu-deltă-mare. Au fost colectate următoarele seturi de date aferente fiecărei organizaţii: nume, categorie, statut, localizare, obiective, descriere, resurse umane şi agendă ştiinţifică.

Etapa a V-a: Redactarea raportului ştiinţific

Instrumentele de cercetare şi sursele de informaţii menţionate mai sus au furnizat date de intrare solide pentru elaborarea diferitelor secţiuni ale raportului şi formularea seturilor de concluzii şi recomandări în legătură cu propunerea de proiect DANUBIUS - RI pentru ESFRI.

Informaţiile incluse în versiunea curentă a raportului se bazează exclusiv pe constatările rezultate din analiza documentară şi concluziile celor două ateliere şi ale reuniunii CII organizate de către partenerii din Consorţiu.

Analiza principalelor puncte forte şi puncte slabe va fi dezvoltată în versiunea finală a raportului, odată ce vor fi disponibile rezultatele sondajului calitativ, permiţând membrilor echipei să formuleze un set relevant de concluzii şi recomandări esenţiale pentru dezvoltarea ulterioară a DANUBIUS-RI, raportul constituind – în consecinţă – un solid studiu de caz.

3. CONSTRÂNGERI ALE RAPORTULUI DE ANALIZĂ

Pe parcursul acestui demers, Consorţiul a formulat următoarele ipoteze şi constrângeri în ceea ce priveşte raportul final:

- Raportul de analiză asupra potenţialului tehnico-stiinţific existent în Regiunea Dunării, cu relevanţă pentru managementul integrat al sistemelor fluviu-deltă-mare, trebuie utilizat în integralitatea sa şi nu parţial.
- Toate materialele elaborate în cadrul acestui proiect vor fi utilizate pentru pregătirea propunerii privind *Centrul Internaţional pentru Studii Avansate Dunăre - Delta Dunării - Marea Neagră* (*DANUBIUS - RI)* în vederea includerii sale pe viitoarea foaie de parcurs ESFRI, ca infrastructură de cercetare majoră pan-europeană în domeniul managementului integrat al

sistemelor de tip FDM, cu accent pe macrosistemul Dunăre-Marea Neagră (apel aşteptat la jumătatea anului 2014).

- Informaţiile cuprinse în acest document se bazează pe eforturile de cercetare şi analiză întreprinse de către consorţiu şi se consideră a fi corecte, constituind informaţii oficiale privind infrastructurile de cercetare, programele şi iniţiativele existente în Regiunea Dunării. Conţinutul raportului de analiză poate suferi modificări şi nu trebuie considerat a fi garantat în nici o circumstanţă.
- Conţinutul acestui raport de analiză a fost elaborat pe baza surselor de informaţii existente, şi anume: informaţii de interes public (paginile de internet ale infrastructurilor de cercetare/ programelor/ iniţiativelor din Regiunea Dunării), minutele întâlnirilor şi prezentările din cadrul evenimentelor organizate de către GEOECOMAR şi INSB (trei ateliere, o şedinţă CII si o intalnire de lucru), Cartea Albă, Cartea Albastră, alte informaţii de interes public obţinute pe parcursul acestui proces (a se consulta secţiunea *Bibliografie*). Sondajul organizat va colecta date ce nu pot fi determinate în prealabil şi va fi interpretat în cadrul versiunii finale a raportului, prevăzută pentru livrare pe data de 30 iunie 2014.
- Raportul de analiză se bazează pe informaţiile disponibile referitoare la centrul DANUBIUS - RI, aşa cum este descris în Cartea Albă, versiunea 7 (fără informaţii de tip cantitativ).
- Autorii nu îşi asumă responsabilitatea privind aspectele de natură juridică.

4. CENTRUL PENTRU STUDII AVANSATE “DANUBIUS”

4.1. DESCRIEREA CENTRUL PENTRU STUDII AVANSATE “DANUBIUS”

Centrul International pentru Studii Avansate a Sistemelor Fluviu-Delta-Mare “DANUBIUS-RI” este o initiativa romaneasca de a crea o noua infrastructura care va reprezenta atat un Centru International de cercetare pentru sisteme Fluviu-Delta-Mare cat si un Pol International de Excelenta pentru cercetare si inovare in management si dezvoltare durabila a zonelor umede si a macrosistemelor fluviu-delta-mare.

O abordare integrata a anumitor probleme si aspecte legate de sistemele fluviu-delta-mare este din ce in ce mai necesara, chiar daca numeroasele organizatii de cercetare, avand ca obiect de activitate studierea fluviilor, estuarelor, deltelor si oceanelor, desfasoara proiecte multidisciplinare in acest domeniu, la nivel european. Acest lucru este necesar pentru ca ecosistemele de la interfata apa-uscat reprezinta zone foarte bogate din punctul de vedere a biodiversitatii, care furnizeaza servicii esentiale si sunt (inca) caracterizate de procese dinamice. De asemenea, impactul actiunilor antropice asupra sistemului este important, acestea exercitand o presiune semnificativa si din ce in ce mai intensa, asupra functionarii sisteme naturale (vulnerabile). Toti acesti factori trebuie considerati parti integrante ale ecosistemului, fiind foarte important sa fie identificate si apoi promovate initiative pentru asigurarea durabilitatii (regionale), a protectiei mediului si a dezvoltarii socio-economice in mod optim.

Initiativa va raspunde in principal cerintelor a doua strategii importante din Europa, pentru viitor, cu privire la mediu, schimbari climatice si biodiversitate, folosind sistemul ca model Dunare – Delta Dunarii – Marea Neagra:

- Strategia Europeana Orizont 2020 si
- Strategia Uniunii Europene pentru Regiunea Dunarii.

Strategia cu un rol major in promovarea viitorului centru este Strategia Uniunii Europene pentru Regiunea Dunarii, elaborata de Comisia Europeana in 2010 si adoptata in aprilie 2011, pe baza contributiilor statelor riverane, care a fost creata luandu-se in considerare argumente socio-economice si geopolitice, cu atat mai mult cu cat Regiunea Dunarii reprezinta 1/5 din teritoriul UE. Aceasta strategie reprezinta un instrument comun pentru cooperare macroregionala in Uniunea Europeana, in care sunt invitate sa participe cele 14 state membre si trei state candidate din Bazinul Dunarii. Centrul international raspunde uneia din actiunile majore ale Planului de Actiune al Strategiei – crearea unui centru international pentru studii avansate in Regiunea Dunarii.

In octombrie 2013, DANUBIUS-RI a obtinut statutul de **Proiect Fanion** in Strategia de Dezvoltare a Comisiei Europene pentru Regiunea Dunarii.

De asemenea, proiectul este considerat de catre Guvernul Romaniei/Ministerul Educatiei Nationale ca fiind un Proiect Major care va fi co-finantat din fonduri publice in urmatoarea perioada, 2014-2020, prin Fondurile Structurale si de Investitii ale Romaniei.

4.2. Descrierea Infrastructurii

Infrastructura Centrului International pentru Studii Avansate a Sistemelor Fluviu-Delta-Mare "DANUBIUS-RI" va cuprinde:

- un sediu central in Delta Dunarii, la Murighiol, pe o suprafata de 10 ha, si
- o retea de noduri distribuite in Europa, care reprezinta de fapt facilitati de top si/sau centre de excelenta in cercetare pentru sisteme acvatice.

Locatia sediului central a fost selectata din 11 locatii din Rezervatia Biosferei Delta Dunarii. Sediul central va fi situat pe malul drept al bratului Sfantu Gheorghe, in Rezervatia Biosferei Delta Dunarii, la Murighiol. Aceasta locatie e deschisa accesului direct de pe drumul national si de pe Dunare, ofera acces imediat in Delta Dunarii si faciliteaza accesul in zona de coasta si pe cursul inferior al Fluviului Dunarea. Consiliul local Murighiol a aprobat 10 hectare de teren pentru construirea centrului.

Abordarea nucleu central+noduri ofera sansa de de a grupa cele mai bune facilitati si competente din Europa si de a sustine un efort concentrat (pe plan international) pentru intelegerea, caracterizarea si gestionarea sistemelor fluviu+delta+mare la nivel global.

Prin aceasta initiativa, oportunitatile oferite de cercetarea in laboratorul natural '*sistemul Fluviul Dunarea – Delta Dunarii – Marea Neagra*' vor fi maximizate prin construirea unei noi infrastructuri de cercetare si prin implicarea activa a cercetatorilor si a institutiilor atat din tara cat si din strainatate. Acesta va furniza rezultate cu un beneficiu real pentru populatia din macro-regiunea Dunare-Marea Neagra, care vor fi transferabile si altor sisteme fluviu-delta-mare.

Centrul international va functiona ca o Infrastructura Distribuita de Cercetare pan-europeana, avand unitatea de coordonare in Delta Dunarii, la Murighiol, cu urmatoarele roluri:

- centru administrativ;
- locatie pentru noi laboratoare de cercetare (sediul va reprezenta si o poarta deschisa catre laboratorul natural Delta Dunarii);
- facilitati pentru educatie.

Nucleul central va comunica cu nodurile distribuite din Europa, reprezentate de facilitatile/centrele de excelenta in cercetare pe domenii specifice.

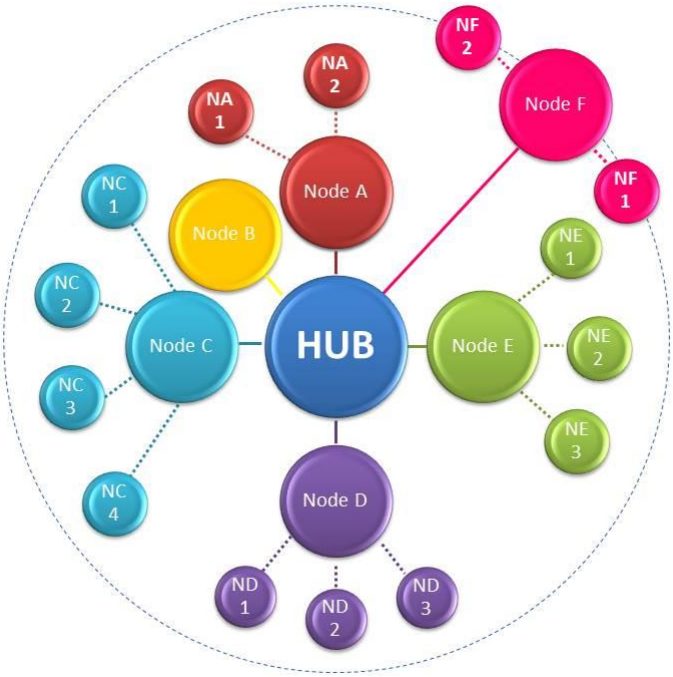


Figura 1. Diagrama care prezinta conceptul centrului ‚DANUBIUS-RI' (nucleu central + noduri)

Centrul va functiona ca o platforma de dialog permanent intre toate partile implicate pentru a identifica si hotari asupra felului optim de folosire a resurselor naturale din zonele sensibile din punct de vedere ecologic, fara a perturba functionarea sau structura ecosistemului.

Nodurile vor fi reprezentate de facilitati de top si centre de excelenta care au ca obiect de activitate cercetarea proceselor naturale si/sau sociale, si/sau ofera acces la alte macrosisteme comparabile (sau parti din acestea). Toate nodurile sunt conectate intre ele in mod direct si de asemenea prin/si cu sediul centrului.

Structura centrului cu un nucleu fizic (sediu) in Delta Dunarii si noduri distribuite in Europa (atat in cadrul cat si in afara Regiunii Dunarii) va oferi astfel sansa de a conecta cele mai bune expertize si capacitati stiintifice din Europa, atat pentru macrosistemul Fluviu Dunarea – Delta Dunarii – Marea Neagra cat si pentru alte macrosisteme similare la nivel global. Expertiza internationala adunata sub umbrela acestui Centru, din stiintele mediului, vietii, Pamantului si cele socio-economice va oferi o baza excelenta pentru dezvoltarea unei structuri care sa lucreze pentru dezvoltarea durabila a sistemelor fluviu-delta-mare.

Crearea DANUBIUS-RI va cuprinde 3 faze, in perioada 2013 – 2020 (pe baza studiului de fezabilitate si a materialelor care vor rezulta din proiectele FP7 DANCERS, si dupa intrarea pe lista ESFRI, a proiectului Horizon 2020 care va fi dedicat DANUBIUS-RI pentru Faza Pregatitoare).

- **Faza 1 – 2014-2016**

Prima faza consta in constructia infrastructurii de baza a nucleului de la Murighiol – „statia de teren”, care va avea:

- Facilitati de cazare si depozitare
- Laboratoare
- Echipament de birou.

In aceasta etapa va fi de asemenea necesara dezvoltarea legaturilor cu alte infrastructuri si facilitati de cercetare, nationale si internationale, implicate in studii ale macrosistemelor fluviu-delta-mare.

La finalul acestei faze, centrul va fi deja o facilitate moderna, pan-europeana, pentru studii complexe in teren a sistemului Dunarea – Delta Dunarii – Marea Neagra.

In aceasta faza se prevede constructia a ~70 % din totalul cladirilor planificate. Acestea sunt:

a. **Cladiri destinate activitatilor de cercetare in sistemul fluviu – delta – mare:**
   - Laboratoare pentru prepararea probelor colectate din teren;
   - Laboratoare pentru analiza probelor care trebuiesc lucrate imediat sau pentru probe care nu pot fi transportate la alte laboratoare fara a fi deteriorate;
   - Facilitati de stocare pentru probe geologice si biologice;
   - Facilitati pentru stocarea pe termen lung a probelor de sedimente – o litoteca;
   - Ateliere pentru construirea si repararea echipamentului de teren
   - Facilitatii pentru pastrarea in bune conditii a echipamentelor de lucru.

b. Cladirea administrativa a centrului si cladire de birouri pentru cercetatori.

c. Cladiri care sa contina sali de conferinte, sali pentru intalniri/cursuri, biblioteca, centru IT (ex. un centru de „cloud computing”), etc.;

d. Cladiri pentru cazarea
   - cercetatorilor,
   - personalului tehnic
   - personalului adimnistrativ,
   - studentilor si
   - vizitatorilor.

Alti pasi importanti de urmat, prevazuti in Faza 1 a constructiei includ:

- inzestrarea centrului cu echipament pentru probare si observatii in situ, inclusiv echipament automat si echipament pentru monitorizare pe termen lung care va fi amplasat in apa (brate, lacuri, canale, etc.).
- Furnizarea si instalarea de echipament stiintific in laboratoare pentru prepararea primara a probelor si pentru analize imediate.
- Echiparea cladirilor administrative si de birouri si a celor pentru conferinte, centru de calcul si cazare;
- Furnizare de facilitati tehnice si logistice pentru centru, care sa corespunda celor mai noi standarde ale strategiilor de management ecologic pentru:
    - Alimentare cu apa,
    - Alimentare cu energie electrica,
    - Tratarea apei reziduale/uzate;
    - Debarcader pentru vasele si barcile de cercetare ale Centrului.

Faza 2 – 2016-2018

A doua faza a constructiei presupune furnizarea, instalarea si testarea echipamentelor de inalta tehnologie, specializate, care vor forma o infrastructura europeana moderna de prim nivel la scara globala, dedicata studiilor inter si multi-disciplinare a factorilor complecsi care controleaza starea mediului si evolutia sistemulelor fluviu – delta – mare.

Lista detaliata a laboratoarelor specializate, de inalta tehnologie, facilitati/dispozitive/echipamente de modelare fizica, facilitati de tip mezocosm, cat si echipamentul specializat pentru aceste laboratoare, va rezulta din Proiectul de Faza Pregatitoare a DANUBIUS-RI dupa acceptarea pe lista ESFRI.

Faza 3 – 2018-2020

Cea de a treia faza a constructiei va consta in dezvoltarea infrastructurii, in conformitate cu nevoile identificate in viitoarea Faza Pregatitoare (si/sau viitoare alte categorii de proiecte – cu parteneri internationali) si acestea for fi reprezentate de facilitati si capacitati de varf la nivel global, dar si de nave de cercetare pentru studiul fluviului, deltei si marii:

- O nava de cercetare de mari dimensiuni, complet echipata, multifunctionala pentru mare (aprox. 2,000 – 2,500 t) si
- O nava de cercetare de mici dimensiuni pentru fluviu, delta si zona costiera.

Nava maritima va fi parte a flotei de cercetare europene, urmand sa devina nava de serviciu a Uniunii Europene pentru cercetarile din Marea Neagra.

Educatia/programul de strategie si infrastructura lui specifica va fi dezvoltata prin colaborari cu universitati, unitati de cercetare – dezvoltare, alte proiecte ESFRI, infrastructuri europene si regionale, precum si cu alte institutii care vor lua parte la activitatile Centrului International Dunarea pentru Studii Avansate in Sistemele Fluviu – Delta – Mare.

4.3. Descrierea agendei stiintifice

Noua Infrastructura de Cercetare distribuita va fi dedicata studierii sistemelor fluviu - delta - mare, si isi propune sa reuneasca echipe trans si interdisciplinare(din toate domeniile) de cercetatori, cu experienta necesara pentru a rezolva problemele legate de sistemele rau-delta-mare. Aceste sisteme complexe si dinamice trebuie să fie mult mai bine cunoscute, caracterizate si comunicate, dificultatile de monitorizare si managementul acestor sisteme (la scara întregului bazin si in timp real) trebuie rezolvate, trebuie sa fie dezvoltat un management integrat si flexibil in scopul de a evalua si analiza raurile, delta, litoralul si marea aflata sub influenta fluviului ca pe o singură entitate.

Din punct de vedere stiintific, este necesara o abordare profunda a problemelor specifice si a intelegerii unor aspecte legate de sistemele fluviu-delta-mare, cu toate ca la nivel european exista mai multe organizatii sau initiative active in domeniul specific stiintelelor de cercetare multi-disciplinara cu privire la rauri, delte si mari (doar segmente ale sistemelor integrate fluviu-delta-mare). DANUBIUS-RI va oferi o perspectivă integratoare asupra sistemului fluviu- delta-mare, fiind o platformă unică si transdisciplinara în domeniu, care va integra cunostintele existente din diferite discipline, precum cele din stiintele Pământului, ecologie, stiintele vietii si stiintele socio-economice. DANUBIUS-RI va facilita si coordona activitati si proiecte de cercetare si va oferi o infrastructura pentru a implementa si mentine puncte de monitorizare in intregul sistem al bazinului hidrografic pana spre zona de mare adanca. De asemenea, centrul va asigura calitatea datelor colectate, stocarea si diseminarea acestora.

Pentru a raspunde la diverse probleme legate de managementul integrat si eficient al sistemelor rau-delta/estuar-mare, o serie de **provocari stiintifice majore la nivel global** trebuie sa fie abordate, cum ar fi:

- intelegerea genezei si evolutiei naturale a macrosistemelor Fluviu -Delta-Mare;
- cuantificarea impactului schimbarilor antropice asupra sistemelor Fluviu–Delta-Mare;
- determinarea vulnerabilitatii si/sau a modificarilor suferite de catre sistemele Fluviu–Delta-Mare ca urmare a schimbarilor climatice;
- caracterizarea ciclurilor biogeochimice in intregul macrosistem Fluviu/Rau-Delta-Mare;

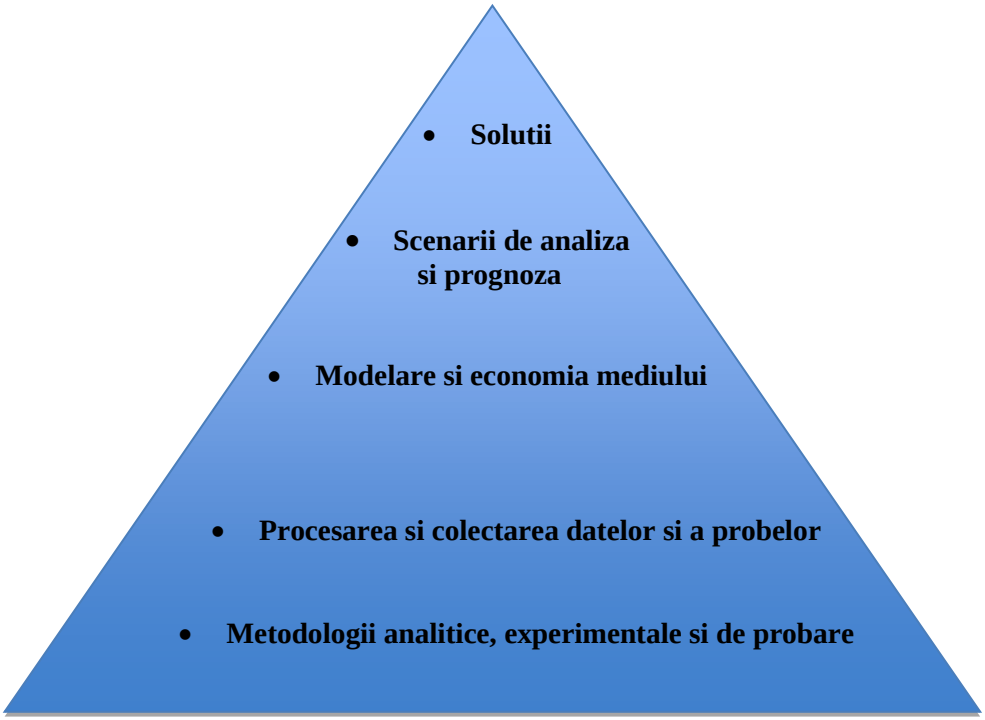
- management integrat avansat cu privire la inundatii/secete catastrofale cu hazard potential asupra intregului macrosistem Fluviu/Rau-Delta-Mare;
- investigarea consecintelor deteriorarii fizice a structurilor morfologice si a habitatului (ex. canalizari, indiguiri, baraje) si determinarea masurilor pentru refacerea hidromorfologiei naturale;
- conservarea si refacerea biodiversitatii din macrosistemele Fluviu/Rau-Delta-Mare;
- imbunatatirea si protejarea bunurilor si serviciilor furnizate de macrosistemele Fluviu-Delta-Mare;
- dezvoltarea solutiilor de management pentru cadrul politic existent si de viitor (de exemplu Directiva Cadru Apa a Comisiei Europene);
- acordarea de expertiza stiintifica pentru dezvoltarea, imbunatatirea si testare de politici si norme de protectia mediului.

DANUBIUS-RI se va implica in programe majore de cercetare a macrosistemelor fluviu-delta-mare care vor raspunde la aceste provocari stiintifice complexe. Capacitatile stiintifice de baza ale DANUBIUS-RI vor cuprinde o piramida a cunoasterii pe care se va baza managementul eficient, integrat, al macrosistemului fluviu-delta-mare.

Potentialul stiintific al Centrului va include (vezi figura 2):

- o infrastructura adecvata de monitorizare, in care se va face colectarea de date si probe complexe si in mod continuu;
- capacitatea de a dezvolta metodologii analitice si experimentale noi si avansate;
- dezvoltarea si aplicarea de modele noi si imbunatatite de mediu din macrosistemele rau-delta-mare, care sa permita elaborarea de predictii;
- dezvoltarea si aplicarea unei abordari noi si performante in ceea ce priveste economia mediului pentru a putea evalua legatura dintre societate si mediu;
- identificarea solutiilor de management pe baza prognozei detaliate si analizei de scenarii cu privire la viitoarele schimbari de mediu.

Figura .2 Diagrama potentialului stiintific al Centrului



In partea superioara a diagramei se poate observa posibilitatea identificarii solutiilor specifice si adecvate pe baza celor mai solide date disponibile si a intelegerii stiintifice ca urmare a activitatii DANUBIUS-RI1 mai sus mentionate.

Pentru stabilirea agendei stiintifice, Centrul isi propune sa se adreseze temelor de cercetare care sunt in prezent de interes (vezi Cartea Alba), precum:

1- **Caracterizarea sistemelor** (inclusiv Geneza si Evolutia macrosistemelor fluviu-delta-mare):

- influenta proceselor geodinamice asupra macrosistemelor fluviu-delta-mare;
- paleoclimatul, paleolimnologia si paleogeografia regionala, hidrologia, transportul de sedimente, ciclurile biogeochimice, hidrogeologia si morfo-dinamica;
- analiza evolutiei ecosistemelor.

2- **Modificarile globale** (inclusiv impactul Schimbarilor Climatice)

- evaluarea schimbarilor din structura si functionalitatea ecosistemelor ca urmare a influentelor naturale si antropice;
- evaluarea in timp real si continuu a calitatii mediului; dezvoltarea unui sistem de avertizare complex care sa vina in ajutorul managementului riscurilor;
- recomandari si norme pentru imbunatatirea nivelului ecologic al ecosistemelor cu probleme de functionare si conservarea speciilor pe cale de disparitie si a habitatului lor.

3- **Managementul flexibil si durabil** al macrosistemelor fluviu-delta-mare.

- metode si modele de dezvoltare durabila pe baza abordarii generale interdisciplinare;
- remedierea sistemului in contextul schimbarilor climatice (ca urmare a influentei climatice si antropice);
- evaluarea schimbarilor sociale ale comunitatilor locale pentru dezvoltare durabila.

Centrul va dezvolta si utiliza alte metode fata de cele folosite pana acum in care, in mod traditional, activitatile de cercetare asupra acestor sisteme erau efectuate separat pe diverse discipline. Aceste noi metode privesc o abordare multi- si transdisciplinara, ca urmare a integrarii mai multor discipline apropiate ca sa poata fi determinate solutii generale cu echipe de cercetatori din diverse ramuri.

Cateva exemple cu teme specifice de cercetare sunt detaliate in Tabelul 1 de mai jos.

Tabel 1. Exemple de topici de cercetare specifice propuse in conformitate cu necesitatile actuale identificate in macrosistemul Dunare – Delta – Marea Neagra.

TOPICI DE CERCETARE SPECIFICE propuse de Centru	
Caracterizarea sistemului	
Originea si evolutia sistemului Dunare – Delta Dunarii – Marea Neagra	- geneza fluviului si a bazinului; - structura geologica; - influenta dinamicii crustei pamantului asupra evolutiei fluviului; - interactiunea dintre fluviu si mare (relatia dintre variatia nivelului marii si conditiile din alte bazine de sedimentare); - formarea deltei; - evolutia depocentrelor, etc.
Procesele geodinamice	- neotectonica; - procesele de ridicare din zona de orogen si formarea si evolutia teraselor fluviului; - subsidenta si compactarea sedimentelor; - corelarea cu evolutia sistemului.
Hidrologie, hidrodinamica, hidrogeologie si sedimentologie	- variatia debitului lichid si solid din sistemul fluviu-delta-mare: - ciclul de sedimentare (sursa – transport – depunere); - bio- si geo-chimia apei si sedimentelor din intregul sistem; - procesele hidrodinamice la interactiunea rau-mare si in zonele lacustre.

Evaluarea si functionarea ecosistemului	- evaluarea stării biotice si abiotice a ecosistemelor fluviu-delta-mare; - poluarea sistemului, eutrofizare, toxicitate, biodiversificare; - evaluarea ciclului hranei, dinamica speciilor si functionarea ecosistemului; - fluxuri de gaze cu efect de sera in zone umede, lacuri si mare.
- **Schimbari de mediu**	
Monitorizarea in-situ a ecosistemului	- evaluarea în timp real si permanentă a calităţii mediului in sistemul fluviu-delta-mare - instalarea de noi tipuri de senzori si echipamente on-line (inclusiv tehnici de micro-si mezocosm); - utilizarea de biomarkeri; - stabilirea seriilor de date pentru analiza pe termen lung a modificarilor din ecosistem.
Monitorizarea terestra si teledetectie	- caracterizarea uscatului si a apei din sistemele fluviu-delta-mare, monitorizarea schimbarilor morfologice si hidrologice, studierea si monitorizarea curenţilor şi a cursului apei, eutrofizarea, dinamica sedimentelor si morfologia albiei raului.
Geo-hazard si evaluarea riscurilor	- evaluarea fenomenelor extreme si a factorilor de declansare, naturali si antropici la diferite scari, cum ar fi: inundatii, secete, alunecări de teren, furtuni; - cutremure; - instabilitati de panta (a sedimentelor) continentala; - geohazardele datorate prezentei gaz-hidratilor in sedimente.
Modelarea, simularea si testarea ipotezelor	- instrumente de predictie pentru evaluarea reactiei mediului inconjurator; - modelarea schimbarilor climatice si de mediu, inclusiv impactul asupra sistemelor fluviu-delta-mare; - efectele evenimentelor extreme asupra sistemului; - impactul cresterii nivelului marii.

Impactul antropic asupra ecosistemului	- degradarea ecosistemului ca urmare a activitatii antropice; - evaluarea dinamicii sociale a comunităţilor locale şi identificarea oportunităţilor economice pentru o dezvoltare durabilă fara degradarea biodiversităţii.
- **Management flexibil si durabil**	
Managementul flexibil al ecosistemului	- Asigurarea bazei stiintifice pentru managementul durabil al sistemelor rau-delta-mare, folosind metode si modele adecvate.
Refacerea si conservarea mediului	- imbunatatirea conditiilor de mediu, refacerea habitatelor, bioremediere, remedierea conexiunilor; - recomandari pentru conservarea speciilor pe cale de disparitie si a habitatelor afectate; - implementarea legislatiei UE; - evaluarea speciilor invazive din afara sistemului.
Inventarierea si evaluarea resurselor naturale	- Studii avansate pentru managementul durabil al resurselor biotice si abiotice prin dezvoltare bazata pe cunoastere si utilizarea unor metode si modele noi (de exemplu, evaluarea beneficiilor ecosistemului).
Evaluarea scenariilor de dezvoltare pentru utilizare durabila	- Abordare interdisciplinara si generala pentru dezvoltarea de noi strategii pentru management durabil. Dezvoltarea de metode pentru crearea si testarea de sisteme de sprijin in luarea deciziilor (DSS) si pentru analiza multicriteriala ca fundamentare in luarea deciziilor.

In plus fata de aceste subiecte stiintifice si manageriale, este preconizat ca DANUBIUS-RI va juca un rol important in:

- **Facilitarea si promovarea educatiei:**
  - Sustinerea programelor de mediu internationale si nationale cu aria de studiu in cadrul macrosistemelor fluviu-delta-mare;
  - Educatie in domeniul mediului pentru cresterea gradului de constientizare in ceea ce priveste problematica din sistemele fluviu-delta-mare.
- **Sustinerea legilor si a regulamentelor in domeniul mediului:**

- Promovarea unei baze stiintifice in vederea imbunatatirii metodelor si a instrumentelor de testare a cadrului legislativ specific, pentru mai buna implementare a politicilor UE;

- **Dezvoltarea de produse si tehnologii ecologice inovatoare:**
  - Concentrarea eforturilor in vederea valorificarii resurselor naturale in sistemele fluviu-delta-mare in conformitate cu directiile dezvoltarii durabile.
- **Dezvoltarea tehnologiilor inovatoare de cercetare-dezvoltare, a echipamentelor si tehnicilor informatice si comunicare de date (IT&C):**
  - Metode inovative de monitorizare, masurare si modelare
  - Noi metode de colectare a datelor, prelucrare, stocare si transfer, unde este necesara dezvoltarea de noi capacitati tehnice si IT&C.
- **Dezvoltarea unei meta-baze de date integrand literatura existenta in domeniu (si date istorice) cat si date** proprii din cadrul programelor ce se vor desfasura in cadrul centrului, in colaborare cu partenerii existenti, in arealul Dunare-Marea Neagra.

4.4. Descrierea Managementului DANUBIUS-RI şi a procesului de Guvernanţă

Din perspectiva resurselor umane, centrul va cuprinde:

- **O echipa de management, constand in**
  - la nivel strategic:
    - Presedinte – Director general;
    - Comitet de coordonare.
  - la nivel operational:
    - sefi de departamente,
    - grupuri de lucru
    - echipe de sprijin.
  - la nivel de sprijin:
    - consiliul consultativ international (incluzand cercetatori de valoare, precum si reprezentanti ai altor posibili beneficiari / utilizatori)

Comitetul Director al centrului este organul executiv, care va lua deciziile DANUBIUS-RI. Aceasta va conduce toate activitatile si va fi responsabil pentru strategia, implementarea si functionarea centrului. Acesta va fi sprijinit de consiliul consultativ international.

Comitetul Director va cuprinde un presedinte, un vicepresedinte si 5 sau 7 membri (inclusiv directorul general al DANUBIUS-RI). Membrii comitetului vor fi numiti pentru a asigura functionarea optima si eficienta a centrului, pastrand in acelasi timp un echilibru rezonabil intre mediile stiintifice diferite, formare si aptitudini.

- **Gupurile si echipele de lucru**

Echipele de lucru vor dezvolta activitatile stiintifice ale centrului, care sunt axate pe directiile principale stabilite de catre Comitetul Director. Structura trebuie sa fie flexibila, cu o participare activa a personalului tehnic, pentru a asigura intretinerea infrastructurii de cercetare. Fiecare grup de lucru va fi condus de un cercetator reputat care ar trebui sa lucreze la un proiect bine definit, pentru o durata limitata.

In plus fata de cercetatori, grupurile de lucru vor fi sprijinite de:

- doctoranzi si post-doctoranzi care abordeaza probleme stiintifice de interes;
- personal stiintific la inceput de cariera, care conduc o activitate de cercetare independenta, sub supravegherea unui cercetator cu renume;
- cercetatori care colaboreaza in zone specifice ale unui proiect pentru o perioada limitata de timp.

La aceasta etapa, sunt avute in vedere doua sectiuni permanente ale centrului, si anume "activitatile IT" si "educatie", pentru a asigura continuitatea.
Pozitia de Director General, precum si toate pozitiile din cadrul departamentelor de servicii vor fi permanente, anuntate si recrutate in plan international. Noul management public va opera pentru a minimiza birocratia si a creste motivatia si eficienta costurilor. Pozitiile de membri ai comitetului director si consiliul consultativ international nu necesita o prezenta personala permanenta la sediul central.

- **Echipele stiintifice si de cooperare**

Ca infrastructura de cercetare de varf (dar si de educatie si inovare) pentru stiintele naturale si socio-economice, DANUBIUS-RI va imbunatati transferul de cunostinte in acest domeniu prin colaborarea stransa cu organizatiile de cercetare si educatie existente.

DANUBIUS-RI va avea printre parteneri o retea stransa de institutii pan-europene si universitati inca de la inceput, astfel incat va beneficia din start de o expertiza deja disponibila. Acesta va coopera cu alte echipe de cercetare pentru a aborda problemele semnificative in macrosistemele fluviu-delta-mare, cum ar fi reducerea biodiversitatii, identificarea de solutii "ecologice" pentru dezvoltarea economica, si buna administrare a resurselor limitate in acelasi timp cu cresterea populatiei.

Cercetatori de varf vor fi invitati sa formeze echipe de baza pentru a lucra in programele de cercetare ale Centrului. Prezenta lor va atrage cercetatori tineri, precum si studenti cu studii universitare finalizate sau/si in curs de finalizare care doresc sa castige experienta in aceste domenii atractive si pe tematici pline de provocari stiintifice. Probele necesare pentru aceste studii vor fi prelevate, pastrate si analizate in cadrul DANUBIUS-RI sau in laboratoarele altor organizatii de cercetare.

Platforma de educatie oferita de DANUBIUS-RI va oferi o valoare adaugata semnificativa prin crearea unui forum pentru schimbul de cunostinte intre cercetatori si intre cercetatori si studenti. In acest sens, forumul va promova proiecte de cooperare, in special intre echipe din estul si vestul Europei. Cursuri intensive, scoli de vara, conferinte si seminarii vor fi mecanisme importante si valoroase de diseminare a cunostintelor. Mai

mult decat atat, Centrul va creste gradul de constientizare a valorii mediului natural si rolul sau in bunastarea oamenilor, prin excursii ecologice si discutii destinate comunitatilor locale, profesori sau turisti.

Alte oportunitati semnificative sunt oferite prin legaturile cu Reteaua Universitatilor de la Marea Neagra. Aceasta retea cuprinde peste 100 de institutii de invatamant superior din regiunea Marii Negre (incluzand Turcia, Georgia, Armenia, Azerbaidjan, Ucraina, Moldova, Romania, Bulgaria, Grecia, Albania, Serbia) si este coordonata de Universitatea "Ovidius" din Constanta, Romania.

DANUBIUS-RI va construi pe baza proiectelor, atat nationale cat si internationale, mai ales europene si in principal Programele Cadru (HORIZON 2020). Acesta va initia in continuare si va participa la proiecte internationale prin cooperarea cu alte organizatii de cercetare majore recunoscute in domeniile lor. Institute romanesti de cercetare relevante si organizatii importante care se ocupa cu studierea si monitorizarea macro-sistemului fluviului Dunare - Delta Dunarii - Marea Neagra vor fi gasi in DANUBIUS-RI o platforma importanta de lucru si educatie.

De asemenea, DANUBIUS-RI va coopera in mod activ cu organizatiile nationale si internationale care sunt desemnate cu gestionarea ecologica si durabila a elementelor specifice fluviului Dunarea - Delta Dunarii - Marea Neagra, prin stabilirea de comun acord a planurilor pentru a rezolvare a unora dintre cele mai importante provocari in macrosistemul Dunare - Marea Neagra.

- **Bazinul Fluviului Dunărea**

Grupul de Lucru Dunăre - Marea Neagră (DABLAS) a fost înfiinţat în anul 2001, cu scopul de a constitui o platformă pentru cooperare în vederea protejării apelor şi ecosistemelor asociate din fluviul Dunărea şi din Marea Neagră. Principalul său obiectiv a constat în dezvoltarea mecanismelor de finanţare pentru implementarea proiectelor de investiţii în vederea reducerii gradului de poluare şi reabilitării ecosistemelor.

- **Marea Neagră**

Ţările cu ieşire la Marea Neagră (Bulgaria, Georgia, România, Federaţia Rusă, Turcia şi Ucraina) au semnat în 1992 şi ratificat în 1994 **Convenţia pentru Protecţia Mării Negre Împotriva Poluării** (Convenţia de la Bucureşti). În vederea implementării Convenţiei, a celor trei Protocoale ale sale (privind poluarea din surse de pe uscat, privind poluarea prin deversare de la bordul navelor şi cel privind acţiunile concertate în caz de accidente, precum scurgerile de petrol) şi a Planului Strategic de Acţiune pentru Reabilitarea şi Protecţia Mării Negre Împotriva Poluării (1996, actualizat în 2002 şi 2009), în anul 2004 a fost înfiinţată Comisia pentru Protecţia Mării Negre Împotriva Poluării (Comisia Mării Negre sau CMN), împreună cu Secretariatul Permanent aferent, în calitate de organism interguvernamental de coordonare.

- **Rezervaţia Biosferei Delta Dunării:**

La momentul înfiinţării Rezervaţiei Biosferei Delta Dunării (RBDD), în anul 1990, Autoritatea pentru Rezervaţia Biosferei Delta Dunării (ARBDD), o instituţie publică aflată sub coordonarea Ministerului Mediului din România.

5. POTENTIALUL TEHNIC SI STIINTIFIC EXISTENT IN REGIUNEA DUNARII, RELEVANT PENTRU MANAGEMENTUL INTEGRAT AL SISTEMELOR FLUVIU – DELTA – MARE

5.1. Analiza infrastructurilor de cercetare existente in Regiunea Dunarii, relevante pentru mangementul integrat al sistemelor fluviu – delta – mare

Infrastructurile majore, programele, proiectele si initiativele de cercetare din Regiunea Dunarii (cuprinzand Germania, Austria, Slovacia, Ungaria, Serbia, Croatia, Bulgaria, Romania, Republica Moldova si Ucraina) au fost analizate din punctul de vedere al activitatii lor specifice in diferitele parti ale sistemului Dunare – Delta Dunarii – Marea Neagra. Astfel, trei categorii au fost stabilite (cele dedicate ‚Mediului Marin', ‚Mediului Costier' si ‚Mediului de Apa Dulce'). Peste 150 de infrastructuri, programe, proiecte si initiative au fost identificate si in plus, o selectie a universitatilor, laboratoarelor si a altor institutii care isi desfasoara activitatea in regiune a fost realizata (acestea au fost grupate in functie de tara in care se afla). Lista acestora, impreuna cu cateva descrieri detaliate sunt prezentate in Anexa 7.1., cu mentiunea ca lista nu este exhaustiva.

In ceea ce priveste lista proiectelor si initiativelor, analiza contine nu numai infrastructurile propriu-zise (ex. Nave de cercetare), dar si proiecte locale si cele deja incheiate. Cele mai multe dintre acestea sunt localizate in regiunea Dunarii Inferioare si Dunarii de Jos – Delta Dunarii – Marea Neagra. Din punct de vedere al activitatii specifice in cadrul sistemului Dunare – Delta Dunarii – Marea Neagra, cele mai multe proiecte (62%) sunt dedicate mediului de apa dulce, in timp ce numai 28% mediului marin. Zona de coasta reprezinta obiectivul a numai 10% din totalul proiectelor de cercetare.

Daca sunt considerate numai infrastructurile si proiectele de infrastructura propriu-zise (ex. Proiecte ESFRI, I3 si infrastructurile regionale) cea mai mare parte a lor (64%) este dedicata mediului marin si costier (18% pentru zona costiera, daca este considerata zone de interactiune si nu este asociata marii). Dintre infrastructurile analizate, numai 36% sunt dedicate Dunarii Superioare, Medii, Inferioare si Deltei Dunarii (Fig 3).

Laboratoarele, universitatile si centrele de cercetare au fost analizate separat, fiind considerate entitati individuale, care isi folosesc infrastructura in tara in care sunt gazduite. Au fost identificate 57 de laboratoare, facultati si institute care au ca obiect de cercetare stiintele vietii si ale pamantului. Dintre acestea numai 2 au ca obiectiv exclusiv Dunarea si Delta Dunarii – Institutul de cercetare Dunarea, al Academiei Ungare de Stiinte si Institutul Delta Dunarii (Romania). Multe dintre acestea studiaza diferite aspecte ale sistemului Dunare – Delta Dunarii – Marea Neagra, raspandite in cuprinsul Regiunii Dunarii – Centrul pentru Schimbari Globale si Durabilitate, Universitatea BOKU, Austria; Institutul de Oceanologie ‘Fridtjov Nansen' al Academiei Bulgare de Stiinte; institutele Max Plank din Germania; institutele nationale GeoEcoMar si „Grigore Antipa" din Romania; Universitatea din NoviSad, Serbia; etc.

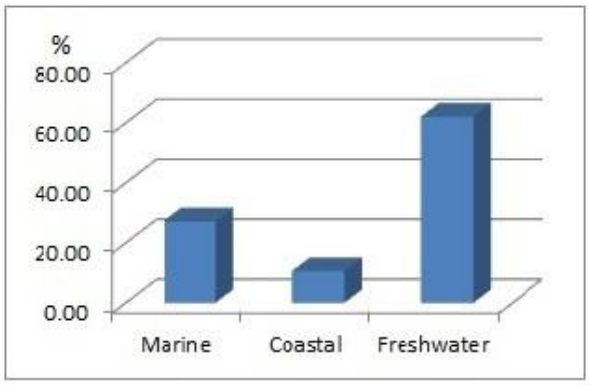
Toate aceste institutii au o zona de actiune limitata de granitele nationale si raspund nevoilor interne de cercetare ale tarilor care le gazduiesc.
Universitatile acopera bine paleta de stiinte ale vietii si pamantului (biologie, chimie, geologie, geografie, etc), atat la nivelul Regiunii Dunarii cat si al nivel national.

Concluzii:

Aceste informatii dovedesc o mai buna organizare si integrare a comunitatii cercetarii marine decat a celei specializate in apa dulce, atat in Europa in general cat si in Regiunea Dunarii in special. In timp ce comunitatea stiintifica care se ocupa de litoralul si selful vestice al Marii Negre (inclusiv de regiunea costiera a Deltei Dunarii) este prezenta in cele mai multe proicte ESFRI relevante si retele I3, dat si in alte programe si intiative majore, comunitatea stiintifica dedicata apelor dulci din Regiunea Dunarii este in general absenta din astfel de consortii. In general Regiunea Dunarii este reprezentata in initiative majore de institutii de cercetare din Germania si Austria (Dunarea Superioara) si Romania si Bulgaria. Totusi, acest lucru trebuie pus in contextul unui numar redus de infrastructuri si initiative de cercetare care se ocupa de studiul mediilor de apa dulce si de tranzitie. DANUBIUS – RI trebuie sa furnizeze o platforma de cercetare care va acoperi acest domeniu.

Institulele de cercetare din cuprinsul Regiunii Dunarii acopera multe dintre domeniile specifice stiintelor vietii si pamantului dar se opresc la granitele nationale. Singura initiativa care studiaza Bazinul Dunarii – ICPDR realizeaza un program integrat de monitorizare (o data la sase ani), dar nu poate acoperi toate aspectele complexe la nivel de bazin. DANUBIUS – RI va avea o abordare integrata a sistemului Dunare – delta – mare, care sa permita o intelegere mai buna de tipul „cauza – efect”.

Universitatile din Regiunea Dunarii acopera bine domeniile de cercetare in stiintele vietii si ale pamantului, oferind o intreaga gama de programe de invatamant de la ecologie la geologie, ceea ce arata ca pregatesc specialisti in aceste domenii care vor putea contribui la studierea sistemului Dunare – delta – mare. DANUBIUS - RI poate veni in sprijinul imbunatatirii competentelor prin programe de doctorat si master care sa raspunda nevoilor pietei la un moment dat si prin specializari noi care nu exista in programele actuale (ex. geologie marina, oceanologie, etc).



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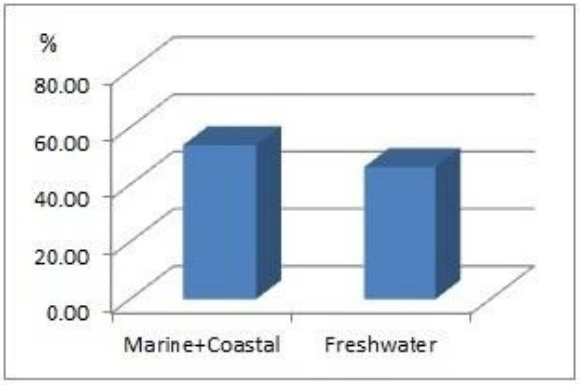


Infrastructures

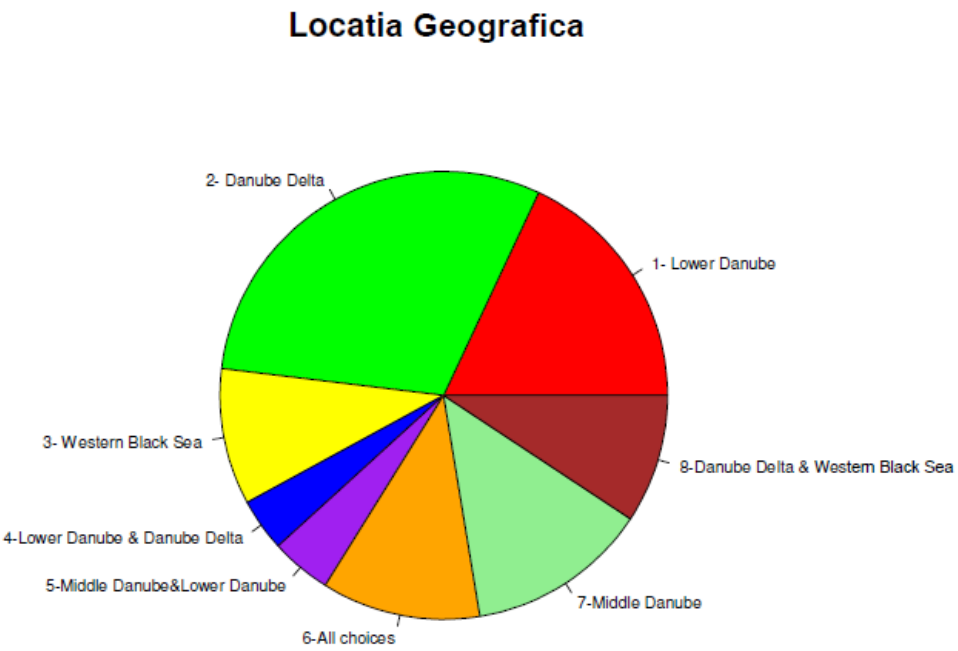
Fig. 3. Imaginea generala a situatiei proiectelor, programelor si initiativelor de cercetare si infrastructurilor (exclusiv) din Regiunea Dunarii, pentu cele trei medii: marin costier si de apa dulce

5.2. Analiza programelor de cercetare in curs si agendei stiintifice, existente in Regiunea Dunarii, relevante pentru managementul integrat al sistemelor fluviu – delta – mare

5.2.1. Cercetari din ciclul apei coordonate de tari din regiunea Dunarii Mijlocii si de Jos si din regiunea Dunarea de Jos-Delta Dunarii-Coasta de Vest a Marii Negre

In prima etapa de realizare a WP2 analiza programelor stiintifice si de cercetare s-a limitat la regiunea Dunarii Mijlocii si Dunarii inferioare incluzand si regiunea costiera de vest a Marii Negre.

Cele 184 de proiecte din esantion au fost analizate din punct de vedere al locatiei geografice, iar distributia acestora este prezentata mai jos:



Numarul proiectelor finantate in fiecare categorie din cele opt prezentate mai sus este descris in tabelul de mai jos:

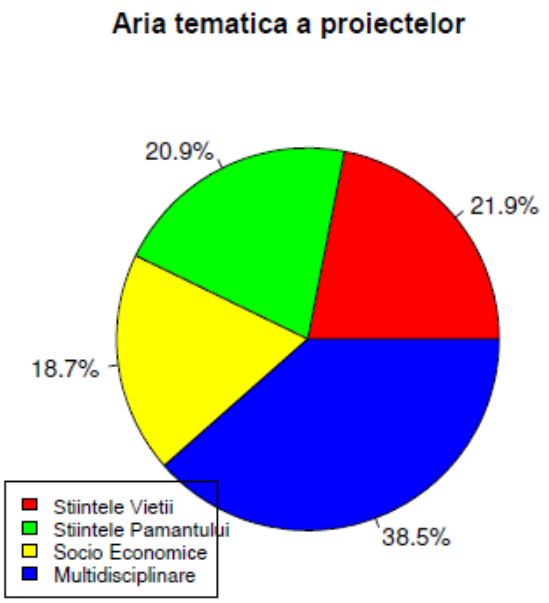
Locatie	1	2	3	4	5	6	7	8
Proiecte	33	55	18	7	8	21	24	17

Aria tematica (*Thematic area*) a proiectelor a fost identificata ca o variabila importanta in analiza realizata, fiind 179 de proiecte cu raspunsuri inregistrate si 5 proiecte cu informatie lipsa. Intrebarea referitoare la aria tematica a proiectului a permis raspunsuri multiple, raspunsurile posibile fiind:

1. **Stiintele Vietii**
2. **Stiintele Pamantului**
3. **Stiinte Socio Economice**
4. **Multidisciplinare**

Tabelul de mai jos prezinta ariile tematice ale proiectelor analizate, unele dintre aceste proiecte avand selectate mai multe arii tematice:

	Aria tematica Selectata	Neselectata
Stiintele Vietii	61	118
Stiintele Pamantului	58	121
Stiinte Socio Economice	52	127
Multidisciplinare	107	72



Asa cum se poate observa in esantionul analizat proportia proiectelor finantate in aria tematica Stiintele Vietii (21.9%) este comparabila cu proportia proiectelor finantate in aria tematica Stiintele Pamantului (20.9%), subliniind faptul ca cercetarea in zona Dunarii si a Deltei Dunarii a fost sustinuta de ambele arii tematice, fenomen explicat partial de puternica corelatie dintre cele doua domenii, ceea ce sugereaza in mod natural ca si in viitor aceste arii tematice sa fie finantate impreuna. Suntem interesati in a testa daca exista

proiecte diferite care sunt finantate in Stiintele Vietii fata de cele finantate in Stiintele Pamantului sau daca aceleasi proiecte sunt finantate sub ambele domenii.

Investigand numarul poiectelor finantate pe combinatiile Stiintele Vietii (SV) si Stiintele Pamantului (SP), obtinem urmatoarele (0 –proiectul nu are finantare sub aria tematica respectiva, 1- proiectul are finantare sub aria tematica respectiva)

SP/SV	0	1
0	83	35
1	44	17

Am testat ipoteza ca variabilele care cuantifica proiectele finatate pe Stiintele Vietii si cele pe Stiintele Pamantului sunt independente fata de ipoteza alternativa ca aceste variabile nu sunt independente, utilizand testul chi-square de independenta. Resultate testului (folosind pachetul R) sunt prezentate mai jos:

chisq.test(mytable)

Pearson's Chi-squared test with Yates' continuity correction

data: mytable

X-squared = 0.0059, df = 1, p-value = 0.9389

Nu am reusit sa respingem ipoteza nula – respectiv ipoteza ca proiectele finantate sub Stiintele Vietii sunt independente de proiectele finantate sub Stiintele Pamantului – contrar cu ceea ce s-a intamplat in cazul analizei efectuata in proiectul DANCERS pentru proiecte coordonate de 26 de tari pentru toata zona Dunarii - si am concluzionat ca in esantionul proiectelor analizat in acest raport, proiectele finantate sub Stiintele Vietii sunt independente/diferite de cele finantate sub Stiintele Pamantului.

Testand restul ipotezelor statistice am identificat ca proiectele finantate sub Stiintele Pamantului nu sunt independente de cele finantate sub Socio Economie, precum si cele din Stiintele Vietii nu sunt independente de cele Multidisciplinare. Mentionam ca in categoria Multidisciolinare au fost considerate proiecte cu componente de modelare si simulare de bioprocesoare, monitorizare in Rezervatia Deltei Dunarii, evaluarea microorganismelor in Biosfera Deltei Dunarii – care au o evidenta componenta in Stiintele Vietii.

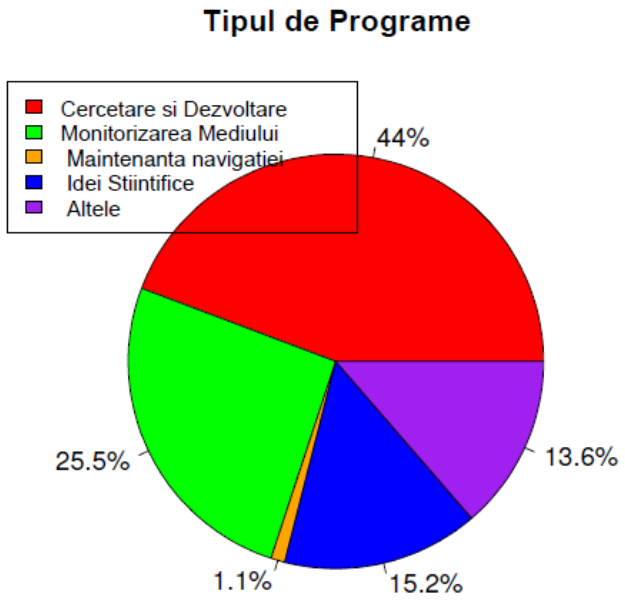
Variabila Tipul Programelor este variabila categorica, cu 5 categorii prezentate mai jos:

1- Cercetare si Dezvoltate
2- Monitorizarea mediului si masuratori
3- Maintenanta navigatiei
4- Cercetare si Idei stiintifice

5- Altele

Au fost inregistrate 184 de raspunsuri, iar frecenta raspunsurilor este prezentata mai jos:

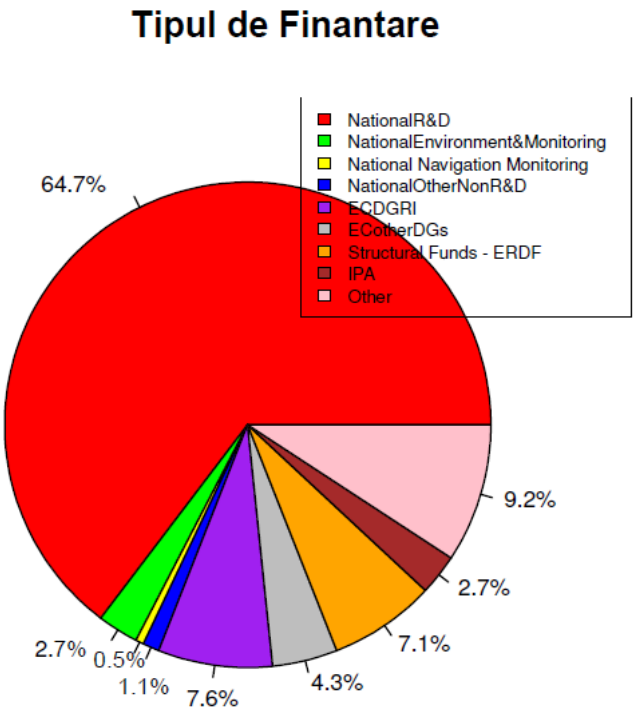
Categorie	1	2	3	4	5
Frecventa	81	47	2	28	25



Se poate observa ca peste 40% dintre proiecte au fost finantate in cadrul programului Cercetare si Dezvoltare (Resurse Umane), urmate de 23% dintre proiecte finantate in cadrul programului Monitorizarea Mediului.

Pentru esantionul analizat, au fost identificate incadrul tipului de finantare, 9 categorii prezentate mai jos:

1. Cercetare Dezvoltare –programe nationale
2. Monitorizarea Mediului –programe nationale
3. Navigatie –programe nationale
4. Programe nationale de dezvoltare (altele decat cercetare)
5. ECDGRI
6. Alte Diretorate Generale CE
7. Fonduri Structurale
8. IPA
9. Altele



Se poate observa ca aproape 70% dintre proiectele din acest esantion sunt proiecte finantate prin programe nationale.

In cea de-a doua parte a analizei, a fost testata ipoteza ca tipul de finantare este la fel pentru fiecare tara analizata, fata de ipoteza alternativa ca tipul de finantare este diferit.A fost respinsa ipoteza nula ***(p=8.373e^{-16})*** si dupa efectuarea de comparatii multiples-a observat ca Serbia are acelasi tip de finantare ca Romania sau Ucraina, iar Bulgaria are acelasi tip de finantare ca Ungaria. Analiza a aratat de asemenea ca Romania si Bulgaria – pe baza datelor care au fost inregistrate – au tipuri de finantare diferite.

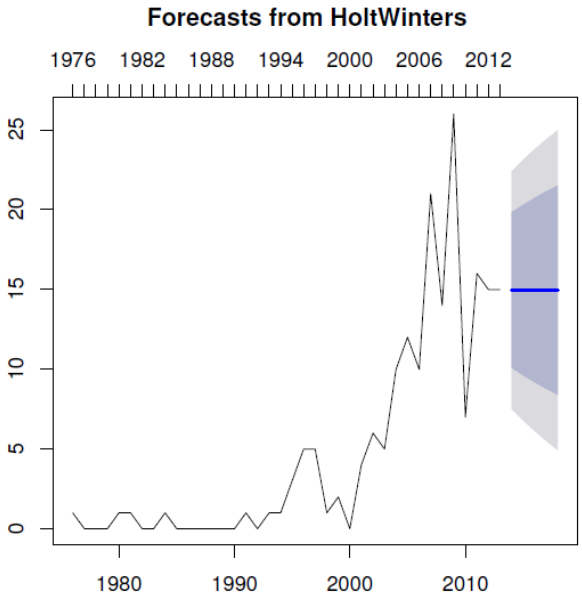
O analiza similara a fost efectuata pentru a testa daca tipul de program al proiectelor finantate este acelasi pentru fiecare tara analizata sau nu si a fost respinsa aceasta ipoteza (p=0.000219) in favoarea ipotezei alternative. Dupa efectuarea de comparatii multiple, au fost indetificate urmatoarele tari cu tip de programe diferite: Bulgaria si Romania si de asemenea Serbia si Bulgaria.

Ipoteza ca Aria Tematica a proiectelor este la fel pentru fiecare tara a fost respinsa (p=9.93e-07) si dupa efectuarea de comparatii multiple pentru fiecare dintre perechile de tari analizate s-a concluzionat ca Serbia si Bulgaria au proiecte cu Arii Tematice diferite, precum si Serbia si Romania.

Urmatoarea ipoteza testate a fost aceea ca Core Category este la fel pentru cele 5 tari analizate si nu am respins aceatsa analiza (p=0.0748), concluzionand ca categriile de Output sunt la fel pentru cele cinci tari participante la analiza.

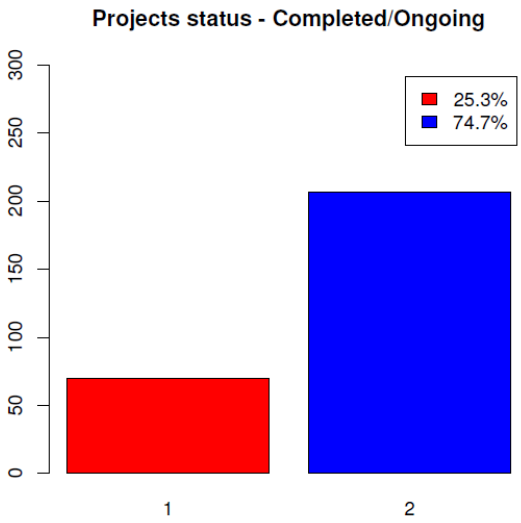
Ultimele ipoteze au analizat daca numarul mediu de publicatii in reviste ISI, BDI, NRJ este egal pentru fiecare dintre tarile analizate si nu a fost respinsa aceasta ipoteza. De asemena nu a fost respinsa ipoteza ca numarul mediu de studenti doctoranzi sau masteranzi este acelasi pentru fiecare dintre tarile analizate, fata de alternativa ca cel putin una din tari are un numar mediu de studenti diferit.

In ultima parte a analizei prezentam o diagrama aratand cum a evoluat numarul de proiecte finanatate in fiecare an sub forma unei serii temporale. Observam ca numarul de proiecte finantate anual a crescut din 1976 pana la un prim varf in 2007 si catre maximul din toata perioada analizata in 2009, urmand ca in 2010 sa scada la nivelul anului 2002 dupa care sa creasca si sa ramana la nivelul anului 2008. In ceea ce priveste asteptarile pentru urmatorii 4 ani sub forma de predictie, se poate observa in partea dreapta a diagramei: prognoza pentru perioada 2014-2018 este punctata cu o linie albastra, un interval de predictie cu 80% nivel de incredere se poate observa in zona albastru inchis umbrit, iar un interval de predictie cu 95% interval de incredere se poate observa in zona albastru deshis umbrit. De remarcat ca intervalul de predictie cu 95% nivel de incredere are limita superioara situata intre varfurile dintre 2007 si 2009.

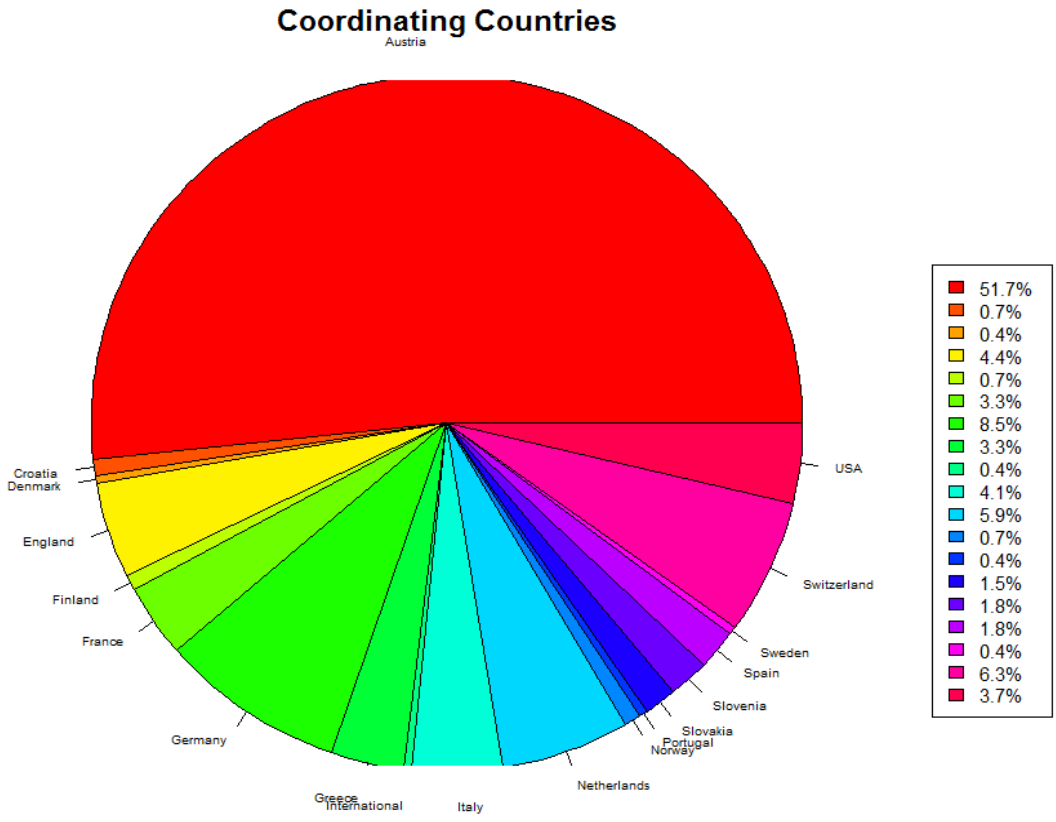


5.2.2. Programe de cercetare din cilcul apei coordinate de catre tari din regiunea Dunarii Superioare si alte tari (Europa si SUA)

Analiza a fost extinsa cu alte 280 de proiecte coordonate de catre 19 tari din Regiunea Dunariisi alte tari coordonatoare cum sunt SUA, Italia, Finlanda, DAnemarca, Olanda etc. Din cele 280 de proiecte nou analizate 70 sunt in derulare, 207 incheiate si pentru 3 proiecte informatia din baza de date a fost incompleta.



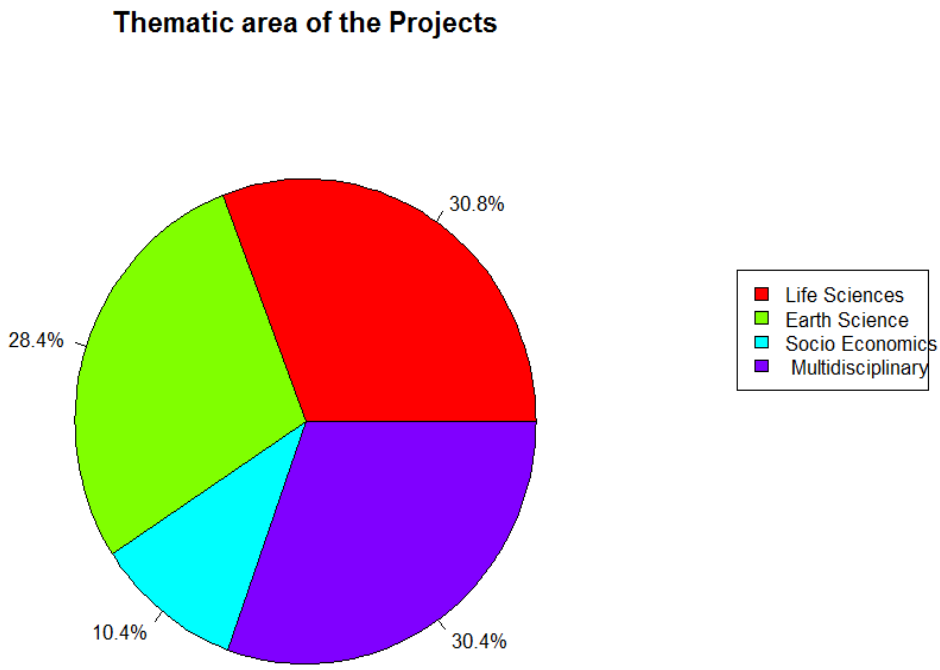
In figura de mai jos este prezentata o imagine de ansamblu asupra prouectelor in functie da tarile coordonatoare.



Ca si in etapa anterioara, aria tematica a fost una dintre variabilele importante identificate, fiind inregistrate patru raspunsuri: Stiintele Vietii (SV), Stiintele Pamantului (SP), Stiinte Socio-Economice (SSE), Multidisciplinare (M).

In tabelul de mai jos sunt prezentate ariile tematice ale proiectelor analizate, unele dintre poriecte avand selectate mai multe tematici.

	Selectat Aria tematica	Neselectat
Stiintele Vietii	89	167
Stiintele Pamantului	88	174
Stiinte Socio-Economice	30	226
Multidisciplinare	88	168



Raportul dintre proiectele finantate pe **Stiintele Vietii (30.8%) si cele finantate Stiintele Pamantului (28.4%)** este aproximativ acelasi cu cel inregistrat si in etapa anterioara a analizei, fiind de fapt aproape 1, ceea ce subliniaza faptul ca cercetarea este sustinuta in mod egal pe ambele directii datorita naturii simbiotice a celor doua arii tematice; de asemenea, se poate spune ca este logic ca, pe viitor, aceste directii sa fie finantate in continuare impreuna, la paritate De asemenea am observat ca, atunci cand se face comparatia dintre poriectele finantate in regiunea DUnarii Mijlocii-Inferioare (Romania, Bulgaria, Serbia, Ukraina, Ungaria) desi raportul dintre stiintele vietii si stiintele pamantului ramane cam acelasi, (ajunge la 1.04-1.08) procentul de proiecte finantate pe Stiintele Vietii si Stiintele Pamantului creste cu 16% pirn finantarea mult mai redusa a cercetarilor in domeniul Stiintelor Socio-Economice (8%) si Multidisciplinare (8%).

Avand in vedere faptul ca multe raspunsuri au indicat 2 sau mai multe arii tematice a devenit importanta intelegerea (semnificatia statistica) a posibilitatilor de combinare intre fiecare dintre ariile tematice vizate, ceea ce a insemnat analiza tuturor combinatiilor pe nivele de cate doua variabile: (SV, SP), (SV,SSE), (SV,

M), (SP, SSE), (SP,M), (SEE, M). In tabelul de mai jos sunt prezentate rezultatele pentru Stiintele Vietii versus Stiintele Pamantului.

Stiintele Vietii/Stiintele Pamantului	0	1
0	83	35
1	44	17

Dupa cum s-a mentionat si anetorior cand analiza a fost limitata la Dunarea Mijlocie si Inferioara si vestul Marii Negre, nu am reusit sa respingem ipoteza nula – respectiv ipoteza ca proiectele finantate sub Stiintele Vietii sunt independente de proiectele finantate sub Stiintele Pamantului – si am concluzionat ca in esantionul proiectelor analizat in acest raport, proiectele finantate sub Stiintele Vietii sunt independente/diferite de cele finantate sub Stiintele Pamantului.

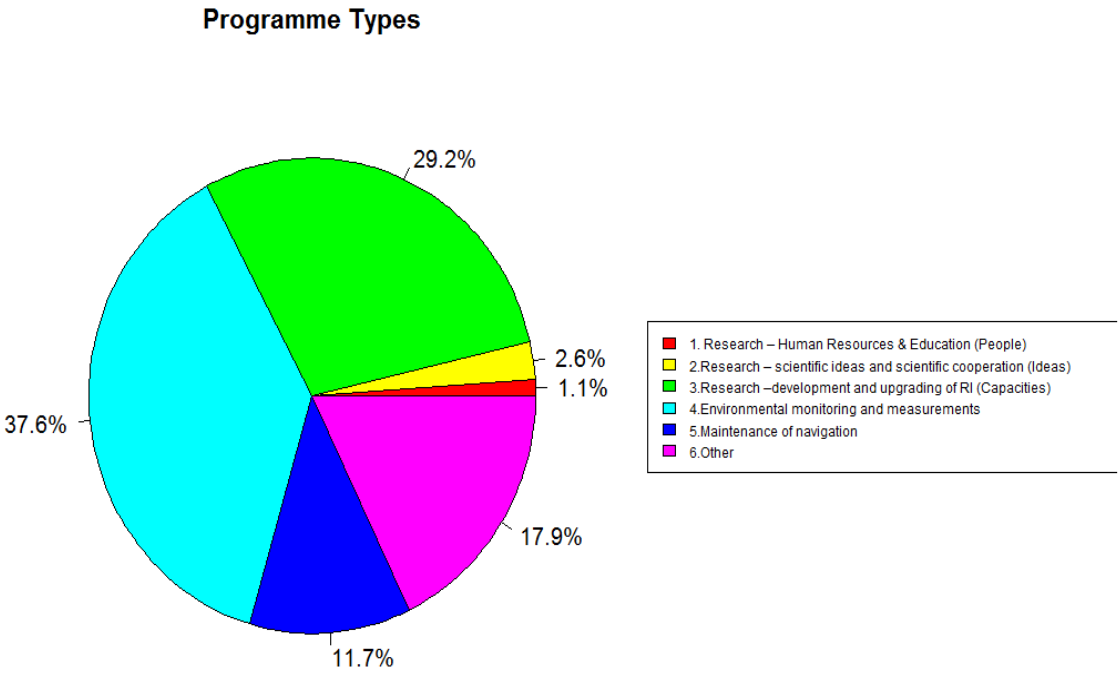
In analiza desfasurata in aceasta etapa de realizare a proiectului au fost identificate 6 categorii atunci cand s-a considerat ca si variabila Tipul de program, si anume: In the current analysis under the **Program Type** we have identified under only 6 categories that have been coded as follows for the analysis:

1. Cercetare-Resurse Umane & Educatie **(People**)
2. Cercetare – idei stiintifice si coperare stiintifica (**Ideas**)
3. Cercetare – dezvoltare si upgradare a infrastructurilor de cercetare (**Capacities**)
4. Monitorizarea mediului si masurari/observatii
5. Navigatie
6. Altele *(SEE Transnational Cooperation Programme, Education, Policy, EESD Energy, Environment and Sustainable Development (FP5))*.

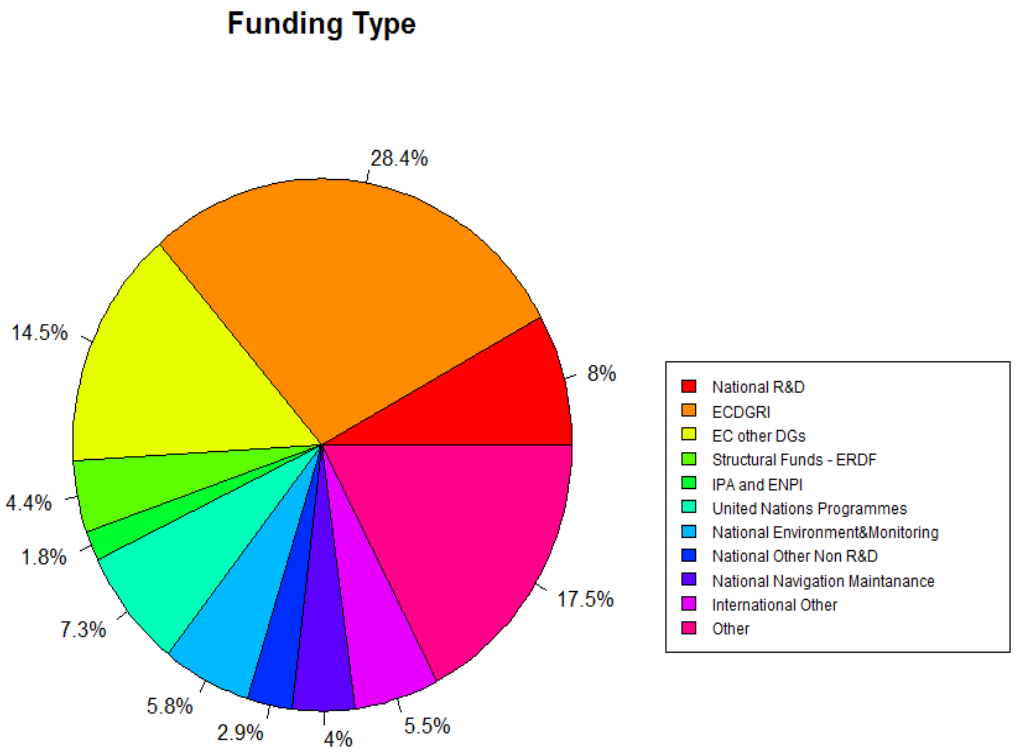
In cazul acestei variabile au fost inregistrate 274 de raspunsuri si 6 au avut informatii incomplete. Repartizarea pe categorii este prezentata in tabelul de mai jos.

Categorie	1	2	3	4	5	6
Nr proiecte	3	7	80	103	32	49

Dupa cum se poate observa din diagrama de mai jos mai mult de 66% din numarul total de proiecte au fost finantate pe ariile tematice 4- Monitorizarea mediului, masurari/observatii si respectiv 3 Cercetare – dezvoltare si upgradare a infrastructurilor de cercetare (**Capacitati**).



Ultima variabila de interes considerata in analiza a fost tipul de finantare, pentru aceasta variabila avand inregsitrari de la 275 de proiecte, 5 inregistrari fiind incomplete.



Analiza descriptive a acestei variabile a furnizat urmatoarele informatii: doua tipuri de finantari au stat la baza finantarii a peste 42% dintre proiectele analizate: ECDGRI si alte directorate generale ale CE.

Este importanta pentru intelegerea fenomenului si efectuarea unor predictii utile DANIBIUS-RI corelatia dintre tara coordonatoare si tipul de finantare accesat. Aceasta analiza a fost realizata in perioada curenta de raportare. A fost respinsa ipoteza nula ($p= 7.347e-^{10}$) care presupunea ca instrumente de finantare similare.

La efectuarea de analiza comparativa multipla au fost identificate mai multe tari care sustin cercetarea din ciclul apei prin mai multe instrumente de finantare, si anume : Austria, Elvetia, Germania, USA, UK.

O analiza asemanatoare a fost efectuata pentru a stabili daca variabila Tip de Program al proiectelor finantate are aceleasi caracteristici pentru fiecar etara coordonatoare sau nu, si ipoteza nula ca tipurile de programme sunt similar a fost respinsa ($p= 1.51e^{-07}$). Diferente substantiale in tipurile de programme au fost observate intre: Austria si UK, respectiv Austria si Germania. Proiectele coordinate de catre UK si Germania sunt finantate majoritar ca si proiecte ECDGRI in timp ce Austria are majoritar proiecte finantate din programme de cercetare dezvokltare nationale, si respective, din proiecte finantate de catre alte directorate generale ale CE.

Ipoteza ca variabila Aria Tematica a proiectelor este aceeasi pentru fiecar etara a fost respinsa cu un nivel de semnificatie mare ($p= 0.0367$). Compararile multiple au demonstrat diferentele la nivelul ariei tematice a proiectelor finantate.

Tari coordonatoare/Arie tematica	Austria	Croatia	Denmark	UK	Finland	France	Germany	Greece	International	Italy	Netherlands	Norway	Portugal	Slovakia	Slovenia	Spain	Sweden	Switzerland	USA
Stiintele Vietii	39	2	0	0	0	2	6	1	0	0	2	0	0	2	1	1	0	1	0
Stiintele Pamantului	22	0	1	7	0	2	2	0	0	2	8	0	0	1	1	2	1	2	1
Stiintele Vietii + Stiintele Pamantului	9	0	0	0	0	1	3	1	0	1	0	0	0	0	0	0	0	7	2
Stiintele Vietii + Stiinte Socio-Economice	3	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
Stiinte Socio-Economice	14	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0
Mutidisciplinar	38	0	0	1	1	3	8	5	1	6	2	2	0	1	3	1	0	6	7
Stiintele Pamantului + Stiinte Socio-Economice	1	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0

Tip de program /Arie tematica	**1**	**2**	**3**	**4**	**5**	**6**
1 (Stiintele Vietii)	1	2	12	42	2	1
2 (Stiintele Pamantului)	1	1	20	20	5	3

3 (Stiintele Vietii + Stiintele Pamantului)	1	0	9	9	3	2
4 (Stiintele Vietii + Stiinte Socio-Economice)	0	0	2	1	1	1
5 (Stiinte Socio-Economice)	0	0	5	3	8	5
6 (Multidisciplinar)	0	3	20	19	10	36
7 (Stiintele Pamantului + Social Economics)	0	0	1	2	1	0

Ca si nivel de impact se poate spune ca s-a observant in urma analizei ca 42 de proiecte apartinand Stiintelor Vietii ca si arie tematica au fost finantate prin fonduri structurale, ERDF, urmate de 36 de proiecte incadrate ca si arie tematica la multidisciplinare, si finantate din categoria alte surse de finantare.

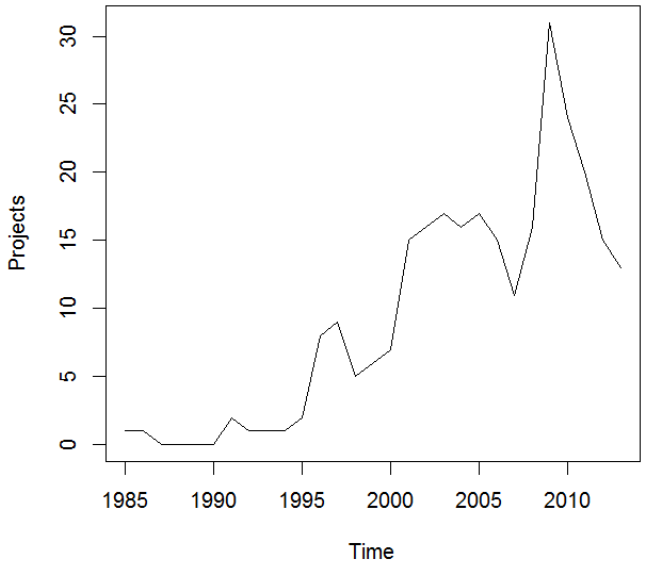
O imagine generala a cestui tip de clasificare este data in tabelul de mai jos.

Tip de program /Tip de finantare	**1**	**2**	**3**	**4**	**5**	**6**
1	0	1	2	10	4	5
2	1	1	70	3	0	0
3	1	1	4	18	4	11
4	0	1	0	4	3	4
5	0	0	0	2	1	2
6	0	1	0	8	3	8
7	0	0	0	15	1	0
8	0	0	0	4	0	3
9	0	0	0	3	8	0
10	1	0	4	6	1	3
11	0	1	0	27	7	12

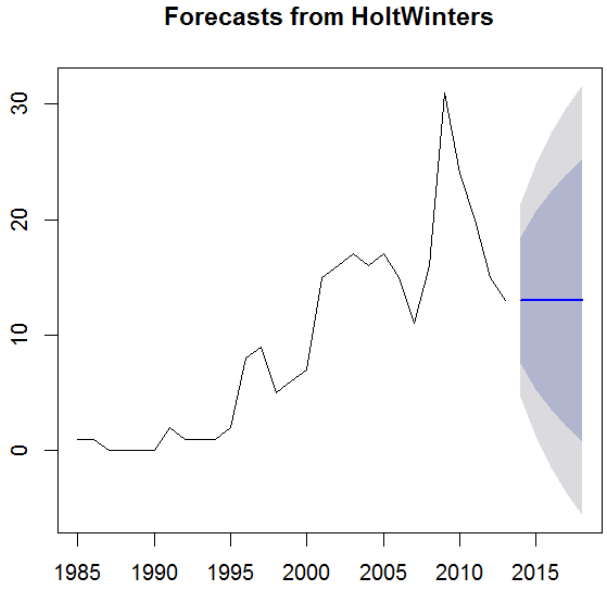
Circa 25% dintre proiectele analizate au fost finantate prin instrumentul de finantare ECDGRI, programul Capacitati.

La nivel de rezultate produse de catre proiectele finantate, la nivel de impact stiintific side formare a resursei umane, adica traduse in numar de articole ISI, BDI sau NRJ si, respectiv, numar de masteranzi/doctori care au fost formati si au intrat pe piata locurilor de munca.

Datele privind numarul de articole ISI au condus la concluzia ca UK, Germania si Olanda au coordonat proiecte care au generat un numar de articole ISI semnificativ mai ridicat decat celelalte tari incluse in studiu. Acelasi concluzii au rezultat si in ceea ce priveste numarul de masteranzi si doctoranzi.



Analizand cresterea nivelului de finantare in ultimii cca 30 de ani, asa cum se observa din figura de mai sus, s-a inregistrat o tendinta de crestere aprozimativ liniara 1985si 2005, cu o mica scadere intre 2005si 2008 si cu un varf de crestere in 2009-2010, dupa care nivelul de finantare a scazut brusc la cel existent in anii 2006. Scenariile, previziounile privind finantarea viitoare sunt prezentate in figura de mai jos, preconizandu-se dupa cum se observa, o finantare in perioada 2015-2018 care va atinge doar nivelul 2003-2005



Ca urmare a acestor analize concluzia este ca o agenda stiintifica ce propune abordari inter-disciplinare si multi-disciplinare incluzand Stiintele Vietii + Stiintele Pamantului + Stiinte Socio-Economice, atat ca teme integrate cat si ca teme unitare, asa cum propune DANUBIUS-RI este capabila sa contribuie la o dezvoltare

unitara a strategiilor de cercetare sis a conduca la un impact pozitiv nu doar la nivelul comunitatii stiintifice ci si la nivelul dezvoltarii regionale durabile.

5.3. Analiza programelor de dezvoltare a resursei umane specializate in mamagementul integrat al sistemelor rau-delta-mare implementate in regiunea Dunarii

Problemele de mediu si asigurarea sustenabilitatii mediului in contextul modificarilor climatice majore, a pierderii biodiversitatii si a altor factori cu impact negativ asupra mediului reprezinta un parametru de risc pentru care trebuie gasite solutii si care fac obiectul de interes al tuturor actorilor importanti din regiunea Dunarii. Resursa umana este capitalul cheie care contribuie major la dezvoltare, la progresul comunitatii si, mai mult, la progresul economic bazat pe cunoastere.

Programele de dezvoltare a resursei umane specializate in managementul mediului (incluzand Stiintele Vietii, Stiintele Pamantului si Stiinte Socio-Economice) sunt dedicate, in principal, specializarilor de master si cateva dintre programele existente includ si programe doctorale; idea de specializare a resursei umane in managementul integrat al sistemelor complexe rau-delta-mare este relative absenta, programele educationale existente in universitati fiind mai mult concentrate pe probleme specifice/particulare.

Se poate observa un anumit grad de segregare bazate pe dispersie regional si de mediu, de exemplu sunt specializari axate in general pe ape de suprafata si mediu acvatic respective pe mediu marin, dar sunt foarte putine specializari pentru resursa umana calificata in problemele zonelor costiere si de tranzitie

Intr-un prim screening al programelor de dezvoltare a resursei umane implicate in cercetare-dezvoltare, precum si a agendei stiintifice a organizatiilor active in regiunea Dunarii precum si a programelor educationale imaginea rezultata este ne-unitara, evidentiindu-se legaturi lipsa intre partenerii potentiali, una dintre principalele carente fiind cea generata de lipsa de cooperare eficienta in dezvoltarea de programme care sa sustina dezvoltarea resursei umane specializate in managementul durabil al mediului si mentinerea serviciilor ecosistemelor.

Se poate afirma ca in regiunea Dunarii exista o concentrare de resursa umana capabila sa contribuie active la implementarea managementului integrat pentru sistemele rau-delta-mare dar capabilitatile existente sunt imprastiate si, cumva polarizate, in mare parte polarizarea fiind orientata geo-economic. Regiunea Dunarii superioare se caracterizeaza prin politici bine definite pentru resursa umana din cercetare, activitatile de cercetare-dezvoltare-inovare desfasurandu-se intr-un mediu socio-economic cu strategii clare in care interconectarea cercetare-programe educationale si chiar mediu de afaceri este functionala si eficienta. In raport cu Dunarea superioara, celelalte zone care din regiunea Dunarii pot fi caracterizate prin centre oarecum izolate, in care exista expertiza, atat la nivel de resursa umana cat si la nivel de infrastructura de cercetare, dar care nu actioneaza coherent si concertat ceea ce conduce la o exploatare mai putin eficienta a resurselor existente. Ca urmare trebuie subliniat in context ca provocarea curenta majora este transformarea eficienta a structurilor existente intr-o retea functionala capabila sa aduca plus-valoare ca urmare a concentrarii resurselor si a asigurarii masei critice de cunoastere care sa contribuie la o dezvoltare durabila a

regiunii. In acelasi timp trebuie subliniat ca, oarecum, aceeasi polarizare este evidenta si in legatura cu topica adresata; daca centrele de cercetare din zona Dunarii inferioare se concentreaza mai mult pe topici legate de interactiunea rau-mare si asupra impactului asupra Deltei Dunarii (incluzand zonele costiere, marine), participarea la astfel de programe a centrelor de cercetare din zonele Dunarii superioare si mijlocii este redusa.

Tot o imagine polarizata rezulta si la analiza numarului de cercetatori implicati in activitati legate de topici de cercetare care au ca subiect managementul sistemelor rau-delta-mare. Zonele Dunarii superioare si mijlocii au decenii de experienta in domeniul programelor educationale dedicate mediului, mentinerii biodiversitatii, schimbarilor climatice si a subiectelor emergente din aceste topici.

Germania, de exemplu, are o abordare coerenta a agendei stiintifice si a cercetarii care, in final conduce la o schema de finantare articulata care stimuleaza obtinerea de rezultate ce contribuie la rezolvarea unor probleme specifice, functionalitatea sistemului fiind bazata pe o retea ce conecteaza eficient mediul academic cu cel antreprenorial orientat catre tehnologii noi/avansate si cu industria, cu centre de inovare si cu structuri care faciliteaza transferul de know-how si de inovare intre mediul academic si utilizatori (stakeholders).

Sistemul German de educatie universitara este caracterizat de conexiuni eficiente intre educatia propriu-zisa si cercetare, cu o componenta importanta de cercetare aplicata care functioneaza atat in sistem privat, antreprenorial, cat si in sistem public. Un exemplu de eficienta in domeniul cercetarii aplicate il constituie institutele Fraunhofer-Gesellschaft care constituie cea mai larga organizatie de cercetare aplicata din Europa. Un alt exemplu de excelenta in cercetare este Societatea Max Planck care se concentreaza pe cercetare fundamentala in domeniul stiintelor naturale, stiintelor vietii, stiintelor umaniste si sociale si care are un rol activ in asigurarea componentei de complementaritate a cercetarii de excelenta in raport cu cercetarea universitara. Componenta de cercetare academica este, de asemenea, puternica, asociatia Helmholtz a centrelor germane de cercetare contributind activ la furnizarea de solutii pentru provocarile majore sociale, stiintifice si industriale prin realizarea de cercetari de top pe directii strategice ce acopera un domeniu larg de interes: aeronautica, spatiu si transporturi, stiintele pamantului si mediu, energie, sanatate, tehnologii cheie si structura materialelor. Nivelul ridicat de interconexiune intre mediul academic, cercetarea aplicata si industrie care exista in Germania este principalul factor care face din aceasta regiune unul dintre furnizorii importanti de expertiza in dezvoltarea resursei umane specializate in managementul integrat al sistemelor rau-delta-mare. Un alt potential furnizor de programe inalt-specializate, care sa contribuie la formarea resursei umane, este Austria. (ex. Universitatea din Viena, BOKU, etc).

La celalalt pol se afla tarile din regiunea Dunarii mijlocii si inferioare care, pana la acest moment, au dificultati si in furnizarea inventarului complet al proiectelor si activitatilor de training desfasurate care au ca topica principala mediul, cercetarile in domeniile conexe si studiile socio-economice concentrate pe regiunea Dunarii si problemele emergente, desi exista resursa umana specializata, dar care este fragmentar-distribuita.

In conformitate cu raportul Ministerului mediului din Republica Ceha functionalitatea educatiei pe probleme de mediu este rezultatul eforturilor comune ale institutiilor de stat, profesionistilor, organizatiilor guvernamentale si neguvernamentale, insa se recunoaste faptul ca efectele inregistrate pana acum sunt locale, cel mult nationale, nicidecum regionale. Aceste universitati sunt implicate active in formarea de resursa umana in domeniul mamagementului de mediu prin programme de master si doctorale, totusi supra-specializarile postuniversitare la nivel de programme doctorale si postdoctorale nu sunt inca bine dezvoltate. Totusi, cu exceptia Germaniei majoritatea dintre acestea au capabilitati si pot fi contributori importanti doar pe componente ale sistemului care defineste managementul de mediu, fiind mai mult decat evident faptul ca pana acum nu a existat o abordare orientata pe specializarea resursei umane in managementul integrat al ciclului apei.

Furnizori importanti de expertiza in domeniul managementului mediului (Stiintele Pamantului si Stiintele Vietii), pe componente, au fost identificati in Ungaria (Szeged si Universitatea din Budapesta), unele universitati din Slovacia, Serbia si Romania. Exemple sunt Universitatea din Belgrad, Facultatea de Chimie, Facultatea de Biologie, Facultatea de geografie si Faculattea de Geologie; Universiotatea idn NoviSad cu Facultatea de Stiinte si Institutul de Genetica moleculara si Inginerie genetica, care au in dotare infrastructura de cercetare de inalta tehnologie si au si expertiza in domenii stiintifice specifice, dar acre au ca si dezavantaj major dispersarea strategiilor si implementarea necoordonata a programelor de cercetare-dezvoltare chiar la nivel national, nemaivorbind despre nivelul regional. Un alt exemplu este Facultatea de Stiinte ale naturii, Universitatea Comeniu Bratislava, care are program de master si de doctorat in doemnii stiintifice care sunt parti ale abordarii multidisciplinare care este necesara pentru implementarea eficienta a managementului de mediu. Dar, in acest caz, ca si in cazul Universitatilor din Romania, se poate spune ca este aproape absenta abordarea integrata, globala a problemelor corelate cu managementul mediului, siguranta ecosistemelor si asigurarea calitatii vietii.Universitatea din Bucuresti prin programele sale de master si doctorat din cadrul Facultatilor de Biologie, Chimie, Geografie, Geologie si Geofizica, ca si universitatea Babes-Bolyai University din Cluj sunt furnizori de resursa umana inalt specializata capabila sa sustina dezvoltarea ulterioara a unor abordari pluri si multi-disciplinare necesare asigurarii implementarii strategiilor priving managementul integrat al sistemelor rau-delta-mare.

Dupa cum este mentionat in raportul SUERD (axa prioritara 9) din Octombrie 2013 extrem de pentru dezvoltarea durabila a regiunii este folosirea eficienta resursei umane actualmente prin dezvoltarea de parghii de comunicare ce vor conduce la plus-valoare pe baza integrarii capabilitatilor, prin utilizarea mai eficienta a instrumentelor deja existente, cum sunt programele Erasmus si Copernicus, si prin eficientizarea structurilor de cooperare regionala.

Educatia si trainingul eficientizat, inovativ sunt bazele pentru a avea resursa umana specializata capabila sa clarifice/sa rezolve provocarile generate de globalizare, variabilitatea demografica, dezvoltarea tehnologica rapida si presiunea sociala crescanda datorata exercitiilor bugetare din bugetele publice. Schimbul de bune practici intre diferite sisteme educationale si programe de training prin intermediu cooperarilor trans-

nationale, implementarii de programe comune si promovarii cercetarii in domeniul economiei educationale, invatarii comune etc poate conduce la metodologii si politici realiste, bazate pe evidenta, si la strategii si actiuni coerente care sa contribuie la dezvoltarea acestui tip de resursa umana specializata.

Resursele si knowhow-ul deja existente in regiunea Dunarii trebuie utilizate cu o coordonare mai buna, exemple importante fiind: proiectele de infrasrtuctura care trebuie sa integreze module de training complexe; programele trans-frontaliere (cum sunt cele Romania-Serbia, Romania-Bulgaria, Ungaria-Serbia, etc) si programele de cooperare trans-nationale (cum sunt mecanismele SEE si Europa central) care au o componenta de training ce, pana acum, nu a fost exploatata suficient.

O alta idee importanta este dezvoltarea de directii de "specializare a profesorilor/invatatorilor" in managementul integrat al sistemelor rau-delta-mare de vreme ce dezvoltarea si implementarea instrumentelor educationale in scolile primare, secundare si in la nivelul asociatiilro profesionale poate fi cheia asigurarii dezvoltarii durabile a regiunii prin cresterea nivelului de constientizare publica.

Totusi, pentru o analiza obiectiva a situatiei actuale, trebuie mentionat faptul ca exista si sunt functionale si unele retele intre universitati si institutii de cercetare din regiunea Dunarii. Cea mai importanta retea de universitati este cea a Conferintei Rectorilor din regiunea Dunarii (DRC), un consortiu format din cele mai importante universitati din regiune care include in acest moment 54 de parteneri. Scopul general al DRC este imbunatatirea sistemelor de educatie, cresterea impactului educatiei superioare in dezvoltarea regional si in cercetare din regiunea Dunarii si stabilirea de contacte bilaterale si multilaterale intre universitatile memebre.

Un alt exemplu de retea regional este aceea a Asociatiei Europene a Universitatilor pentru Stiintele Vietii din Europa Centrala si de Sud Est, ICA-CASEE care are in present 22 de membri. Aceasta asociatie, ICA-CASEE a fost fondata in 2010 (de catre universitatea BOKU, Viena) si are ca obiective de baza:

- Sustinerea inplementarii strategiei EU pentru regiunea Dunarii
- Stimularea cercetarii, educatiei si dezvoltarii universitatilor din regiune
- Dezvoltarea si implementarea de proiecte comune de cercetare, educatie precum si alte proiecte regionale

Aceste obiective pot fi atinse, de exemplu, prin asigurarea unei curricula complementare, prin oferte educationale comune, prin eforturi comune de dezvoltare structural si de resursa umana, prin transfer de cunoastere si prin implementarea unor protocoale comune de evaluare si asigurare a calitatii, etc.

Pentru evitarea migratiei creierelor si pentru a asigura circulatia expertilor un punct critic il reprezinta asiguararea unor scheme de finantare solide si sustinerea unor programme de schimb international de student, profesori, oameni de stiinta. Aici DANUBIUS-RI poate juca rolul de integrator si coordinator al

resurselor existente, si de contributor major la realizarea unei strategii coerente privind politica de resursa umana din regiune.

Concluzia care se structureaza in acest moment cu privire la programele de dezvoltare a resursei umane specializate si rolul DANUBIUS-RI este ca DANUBIUS-RI poate fi un actor important in eficientizarea comunicarii intre "partenerii sociali" mediul academic, utilizatorii industriali si comunitate prin furnizarea de expertiza si de strategii regionale armonizate dezvoltatea pe baza unui nivel de cunoastere supra-specializata.

5.4. Analiza potentialului tehnic si stiintific al infrastructurilor de cercetare din Regiunea Dunarii si relevant pentru managementul integrat al sistemelor fluviu – delta – mare

Dupa analiza potentialului tehnic si stiintific al infrastructurilor de cercetare relevante pentru managementul integrat al sistemului Dunare – Delta Dunarii – Marea Neagra, pot fi enuntate urmatoarele concluzii:

- In toata regiunea Dunarii nu exista o infrastructura pentru managementul integrat al sistemelor FDM (i.e. Dunarea – Delta Dunarii – Marea Neagra).

- Diferite facilitati, laboratoare si alte IC exista in Regiunea Dunarii, dar sunt risipite, dedicate mai ales scopurilor regionale/nationale; nivelul lor de interactiune/comunicare nu este optim;

- Exista o polarizatie in scop si distributie a IC – cele mai multe facilitati fiind concentrate in regiunea Dunarii Superioare (Germania si Austria) si dedicate mai ales ecosistemelor de apa dulce, in timp ce tarile din regiunea Dunarii Mijlocii (Ungaria, Croatia, Serbia) au de asemenea astfel de IC, dedicate mai ales mediilor dulcicole. Al doilea mare pol care grupeaza facilitati de acest fel este totusi in regiunea Dunarii de Jos – Delta Dunarii – Marea Neagra (Romania, Bulgaria, Moldova, Ucraina), unde cel mai mare efort este concentrat in cercetarea marina (chiar daca exista facilitati pentru apa dulce).

- Cele mai multe IC dedicate cercetarii apelor dulci, din Regiunea Dunarii, nu sunt implicate in prezent in IC pan-europene majore (ESFRI, I3, infrastructuri regionale), nici nu sunt reprezentate in structuri la JPI Water Challenges. Aceasta absenta este totusi corelata cu lipsa generala de coordonare dintre IC de apa dulce din Europa.

- IC pentru zona costiera si marina din regiunea Dunare – Marea Neagra sunt integrate in cele mai multe dintre eforturile pentru infrastructure pan-europene (EMSO – Romania, EURO-ARGO – Bulgaria, EMBRC – Romania, I3 projects like EUROFLEETS, HYDRALAB, JERICO, etc- ambele tari).

- Nu exista nici o iC dedicata intelegerii profunde a mediilor de tranzitie (ape dulci-mediul marin) – dar acesta lipsa este identificata de asemena si la nivel european.

Totusi in ciuda lipsei de conectivitate, IC din Regiunea Dunarii acopera cele mai multe aspecte ale cercetarii necesare unei abordari integrate a sistemelor FDM, asa cum este prezentat in anexele acestui raport.

Aceste facilitati, unele imbunatatite, alte nu, unele mai bine conectate decat altele la IC europene dedicate, mai mult sau mai putin integrate intre ele, exista in numar mare.

De aceea noi consideram ca aceste acilitati reprezinta masa critica necesara construirii unei infrastructuri distribuite, dedicata sistemelor FDM, concentrata pe Regiunea Dunarii. Totusi, aceste IC trebuie imbunatatite si dezvoltate, mai bine conectate si corelate in vederea acestui scop.

Lipsa IC pan-europene in domeniul sistemelor FDM (si in cercetarea mediilor dulcicole in general), cat si in studiul mediilor tranzitionale ar trebui considerata o oportuniatte majora pentru entitatile exitente in Regiunea Dunarii, ca acestea sa devina nucleul unui astfel de efort.

5.5. Analiza principalelor puncte tari si puncte slabe ale infrastructurii de cercetare din Regiunea Dunarii, relevante pentru managementul integrat al sistemelor fluviu – delta – mare (*infrastucturi de cercetare, agenda stiintifica si dezvoltarea resursei umane*)

Punctele tari in ceea ce priveste resursele umane din Regiunea Dunarii sunt determinate de existenta unei mase critice de resurse umane care pot asigura un nivel inalt de expertiza in diverse domenii care contribuie la o abordare multi/interdisciplinara, pentru rezolvarea problemelor complexe legate de sisteme FDM. Acelasi lucru poate fi spus si despre IC (vezi Cap. 5.4.). Teme de cercetare au fost dezvoltate in tot bazinul Dunarii, chiar daca punctul lor focal a fost regional si axat pe probleme specifice fiecarui sector din sistemul Dunare – Marea Neagra (tarile Dunarii Superioare si Mijlocii sunt mai mult implicate in cercetarea apelor dulci, iar cele din Dunarea de Jos – Delta Dunarii – Marea Neagra in cercetarea mediilor de tranzitie si marine).

Finantarile nationale pentru cercetare&dezvoltare au constituit principala sursa pemtru cercetarea stiintifica din toate tarile dunarene, chiar daca rolul Comisiei Europene a fost in crestere in ultimele doua decenii. Cu toate acestea, numarul proiectelor de cercetare si a surselor de finantare arata o diferenta neta intre Germani si Austria (pe de o parte), fostele state comuniste ca Slovacia, Ungaria, Romania si Bulgaria, dar si statele din fosta Iugoslavie (Croatia si serbia, tari afectate de razboi si embargouri economice pentru multi ani) si Moldova &Ucraina, care au fost recent acceptate ca state sociate UE.

Trecutul isoric recent (perioada comunista si post-comunista) reprezinta una dintre principalele cauze ale punctelor slabe: risipirea cercetarii in Regiunea Dunarii, dar si lipsa de comunicare. Etapa de reorganizare este refectata in prezent de dezvoltarea a mai multor aspecte ale cercetarii (IC, agenda educationala i stiintifica).

In Germania si Austria sistemul integreaza toate partile interesate (mediul academic, industrie si afaceri, societate) si exista deja strategii adoptate care implica unitatile de educati superioara, IC, structuri de cercetare, reprezentanti ai industriei si afacerilor, ai societatii, factori politici si decizionali, in timp ce in

celelalte tari dunarene (Slovacia, Croatia, Ungaria, Serbia, Romania, Bulgaria, Moldova si Ucraina), resursele umane (dar si facilitatile in general) sunt risipite, concentrate pe chestiuni punctuale si sunt afectate de lipsa unei comunicari adecvate dintre mediul academic/de cercetare&dezvoltare si celelalte parti, reprezentanti din mediul de afaceri si industrie sau factori de decizie.

In consecinta, principalele puncte slabe sunt:

- Polarizarea inaltei specializari intre Dunarea Superioara si Dunarea Medie si de Jos. Specializari dedicate cercetarii marine sunt mai ales in tari din regiunea Dunarii de Jos.
- Disperia spatiala
- Dispersia stratetgica
- Lipsa de coerenta, atat in dezvoltarea de resurse umane cat si in strategiile privind managementul integrat al sistemelor FDM.

Educatia superioara si cercetarea stiintifica reprezinta cheia pentru dezvoltarea Regiunii Dunari, cu toate aspectele durabilitatii. Programele strategice sunt cai probate si confirmate pentru sustinerea cu succes a durabilitatii unei regiuni, crescand valoarea creata intr-o regiune si asigurand securitatea sociala. Strategiile pentru specializari inteligente si cooperare transnationala trebuie implementate si, in ideea ca DANUBIUS-RI va fi un promotor al solutiilor de top si un initiator capabil de a gasi noi cai pentru dezvolatre viitoare si de a umple golurilor crearii de resurse umane, rolul sau sau va fi acela de furnizor al strategiilor de dezvoltare pe baza rezultatelor cercetarii integrate si implementate de resurse umane inalt specializate pentrua a face fata provocarii zilelor noastre ca macroregiune si la nivel global. Efectele sinergetice in si intre universitatile din Regiunea Dunarii si organizatiile si institutele de cercetare trebuie intarite pentru a mari sustinerea politica si economica.

Este important de inteles ca politicile dezvoltate in domeniul educatiei si cercetarii sunt coerente cu aplicatiile lor in domeniul afaceri si industrie si ca cerintele economice sunt luate in considerare ca prioritati ale educatiei si cercetarii. Unind fortele educatiei – cerectarii – economice, un avantaj competitiv strategic va fi dezvoltat pentru structura care diferentiaza abordarea DANUBIUS-RI de altele similare, concentrandu-se mai bine pe furnizarea de solutii complete si sanatoase pentru problemele sociale si economice, legate de bunastare si mediul inconjurator, toate acestea luate impreuna si interconectate.

Analizand potentialul Regiunii Dunarii se contureaza clar necesitatea crearii si dezvoltarii de noi specializari si facilitati in masura sa creeze competente pentru implementarea unei noi economii, bazate pe cunostere, cercetare.

In acelasi timp, ar trebui mentionat ca DANUBIUS-RI va sustine activitatile educationale pentru a introduce tinerii cercetatori in sisteme complexe, fiind atat integrator al expertizei deja existente cat si promotor a strategiilor comune capabile sa sustina managementul integrat al sistemelor complexe FDM.

6. CONCLUZII SI RECOMANDARI

Regiunea Dunarii nu este bine conectata cu initiativele europene majore de infrastructuri de cercetare (ESFRI, LTER, I3), dedicate domeniilor legate de apa dulce. In afara de Germania, Austria si Romania, exista foarte putini parteneri (Bulgaria) sau nu exista deloc reprezentanti din Regiunea Dunarii in aceste infrastructuri. Situatia generala este caracterizata de fragmentare si slaba comunicarea intre diferitele infrastructuri care au legatura cu sistemul Dunare-Delta Dunarii-Marea Neagra, si care necesita imbunatatiri mari. O alta discrepanta majora exista intre infrastructurile dedicate apelor dulci si cele costiere si marine. Infrastrcucturile marine pan-europene majore sunt bine conectate cu NV Marii Negre, atat Romania cat si Bulgaria fiind membri in aceste structuri ESFRI (Romania in EMSO si Bulgaria in EURO-ARGO) si proiecte I3 (ambele in EUROFLEETS, Bulgaria in JERICO, Romania in HYDRALAB IV). Aceasta dovedeste si o mai buna organizare a comunitatii de cercetare marina decat a celei care se ocupa de apa dulce, nu numai in zona dar si in Europa in general. Nu exista in acest moment infrastructuri majore care doresc sa lege fluviul de mediul de tranzitie apa dulce-sarata si costier ale sistemului. In acest fel, DANUBIUS – RI ar acoperi un gol major in peisajul infrastructurilor din Regiunea Dunarii dar si din Europa (vezi raportul fazei I).

Cu toate acestea, in toate tarile danubiene exista capacitate cu potential major de imbunatatire (asa cum a fost aratat pana acum). Aceste capacitati trebuie insa intarite, integrate si facute sa colaboreze eficient in acord cu o strategie coerenta. Chiar mai mult, aceste capacitati trebuie sa coopereze mai bine cu alte facilitati din Europa, dupa o filozofie coerenta pentru intregul bazin al Dunarii. Din nou, DANUBIUS – RI ar trebui sa raspunda acestor probleme, furnizand solutii si strategii.

Educatia reprezinta o alta problema critica. Necesitatea cresterii numarului de initiative care doresc imbunatatirea calitatii educatiei in linie cu cererile pietei de munca, necesitatea crearii de oportunitati pentru o mai buna calificare si generarea conditiilor de dezvoltare a cercetarii aplicate, avand in veder transferul de cunoastere reprezinta factori-cheie de dezvoltare in Regiunea Dunarii.

Rolul DANUBIUS – RI este acela de a acoperi in mod eficient golul de comunicare intre ‘parti’ (mediul academic, industrie, comunitate), acordand expertiza specializata si fiind furnizorul unor strategii armonizate bazate pe cunoastere de nivel inalt.

Rezultate ale conferintelor si seminariilor

In Regiunea Dunarii, fragmentarea institutiilor de cercetare este si mai acuta. Cauzele sunt legate de aspecte heterogene din institutii si proiecte. Colaborarea nu este nici ea optima, datorita abordarilor divergente in tematica de cercetare si zona de interes.

Avand de a face cu diferite tari/institutii in diferite elemente ale sistemului (fluviu, delta, mare), fiecare isi stabileste diferit directiile prioritare de dezvoltare si colaborare, fara sa analizeze in general, imaginea de ansamblu.

La nivelul de institutii coordonatoare, acestea sunt dedicate marii (Comisia Marii Negre) sau fluviului (ICPDR – Comisia Internationala pentru Protectia Fluviului Dunarea). Fiecare dintre ele are prioritati si obiective divergente si diferite. O incercare anterioara (2000-2009) de a corela mai bine cercetarea de mediu in zona Dunarii si a Marii Negre – DABLAS – a inceput cu success dar s-a incheiat datorita evolutiei anilor 2000. Strategia Europeana pentru Regiunea Dunarii (EUSDR) reprezinta o initiativa care integreaza prioritatile din zona. De aceea, EUSDR a acordat statutul de Proiect Fanion in regiune pentru DANUBIUS – RI, pentru modul in care acest proiect integreaza si armonizeaza prioritati si idei.

Un punct important este totusi intelegerea prioritatilor si intereselor fiecarei tari in relatie cu pozitia ei in Regiunea Dunare – Marea Neagra, pentru ca aceasta explica partial diferentele, atat din punctul de vedere al dezvoltarii economice cat si din punct de vedere al agendei stiintifice si prioritatilor (a se vedea preocuparile Ungariei pentru apa pluviala).

Peste 450 de proiecte majore derulate sau in curs de derulare in ultimii 15 ani au fost identificate prin Proiectul FP7 DANCERS. Aceasta demonstreaza ca zona are capacitatea de a trage fonduri, chiar daca in mod fragmentar. De aceea consideram ca un proiect pan-european ESFRI, cu statutul legal de ERIC, va facilita si va da valoare aspectelor financiare din zona si va contribui la sporirea interconectivitatii cu restul Europei. DANUBIUS – RI va fi un punct de validare unic, din punct de vedere stiintific, mai ales in programul Orizont 2020.

DANUBIUS – RI va integra institutii si tari din regiunea Dunarii si Marii Negre atat intre ele cat si cu restul Europei, cu atat mai mult cu cat nodurile sale vor aduce excelenta in expertiza si cercetare din toata Europa.

Din punctul de vedere al comunitatii de afaceri, DANUBIUS – RI trebuie sa abordeze prioritati si obiective traduse in teme simple si cuprinzatoare care pot atrage mediul privat in forme multiple de colaborare. Comunitatea stiintifica implicata trebuie de asemenea sa inteleaga, sa clasifice si sa sintetizeze interesele comunitatii de afaceri, constrangerile si prioritatile, pentru a putea furniza rezultatele asteptate.

O atentie speciala ar tebuie acordata aspectelor colaborative cu JPI (Joint Programming Initiatives), dintre care JPI Water si JPI Oceans sunt de interes special pentru DANUBIUS – RI.

Aspecte colaborative

Oragnizatiile de cercetare analizate in panel folosesc infrastructuri cu acces deschis la date in proiectele colaborative in care participa si pun la dispozitie propria infrastructura in cadrul proiectelor pan-europene. Facilitatile de cercetare sunt disponibile direct in cadrul organizatiei (laboratoare cu echipament stiintific performant, statii de masura in situ si la distanta) sau pot fi accesate in colaborare cu alte institutii partenere (vapoare de cercetare, vehicule subacvatice teleghidate si submarine, drone, instalatii de teste hidraulice si hidrodinamice, baze de date).

Concluzii:

- Exista numeroase facilitati de cercetare si institutii in Regiunea Dunarii, care pot fi incluse in DANUBIUS – RI.
- O organizatie de cercetare poate fi parte (ca nod, satelit, partener cu sau fara drept de vot) la una sau mai multe initiative si proiecte de cercetare, deschizand astfel o perspectiva lui DANUBIUS – RI, de a include astfel de infrastructuri ca sateliti sau viitoare noduri.
- In Regiunea Dunarii exista multe organizatii de cercetare care nu sunt incluse in infrastructure distribuiti, si reprezinta potentiali participanti in proiecte viitoare de infrastructuri distribuite. DANUBIUS – RI ar putea include unele dintre aceste institutii ca noduri, sub coordonarea centrului, atata timp cat vor fi identificate beneficiul comun in domeniul de cercetare si sustenabilitatea nodului.

Rezultatele agendei stiintifice:

Concluzii:

- Agendele institutiilor de cercetare si proiectelor din Regiunea Dunarii acopera aspecte legate de managementul ciclului apei, geostiinte, stiintele mediului si ale vietii.
- Nu toate agendele acopera ciclul apei, asa cum sunt definite in Cartea Alba a DANUBIUS – RI, dar aceasta poate fi cobnsiderata o complementaritate.
- Exista maniere diferite de a prezenta agenda unei institutii:
    - Dupa obiectiv
    - Dupa rezultate
    - Dupa metode
    - Dupa sistemul sau obiectul de studiu
    - Dupa colaborari
- In ceea ce priveste aspectele colaborative si de conectivitate pentru fiecare organizatie, agenda stiintifica este dezvoltata in relatie directa cu numarul proiectelor de colaborare trecute si actuale.

Resurse umane

Resursa umana intr-un proiect la scara larga, pan-europeana, reprezinta totatlitatea resurselor alocate, care se ocupa de cercetare, colaborare, educatie si managemntul unui astfel de proiect.

Concluzii

- Numarul total de persoane da o idee despre dimensiunile organizatiei;

- Personalul fiecarei organizatii este in relatie directa cu agenda stiintifica si proiectele in care aceasta este implicata;
- Personalul DANUBIUS-RI va fi planificat in acord cu propriile nevoi de cercetare si perspectiva de dezvoltare.
- Managementul DANUBIUS-RI va cauta complementaritate in termeni de educatie si abilitati in comunitatea de cercetare din Europa;
- Criteriile folosite pentru selectia nodurilor vor include de asemenea si resursa umana si abilitatile si inzestrarile fiecarei organizatii care candideaza;
- Relatia de colaborare a DANUBIUS-RI va fi definita pe baza unei analize detaliate a potentialului resurselor umane a organizatiei corespunzatoare.

Provocari si probleme nerezolvate

Principalele provocari identificate sunt legate mai ales de aspecte financiare si instutitutionale si de dezvoltarea unor domenii de cercetare specifice printr-o abordare colaborativa.

Concluzii

- Exista o lipsa in programele de educare si formare in domeniul ciclului apei pe care DANUBIUS – RI o poate suplini cu programe de instruire si mobilitate.
- Lipsa mobilitatii si dispersia geopolitica, dar si un numar redus de resurse umane in cercetarea ciclului apei reprezinta o lipsa care va fi acoperita de DANUBIUS – RI.
- Cum centrul DANUBIUS-RI va fi in Delta Dunarii, nevoia de facilitati si experienta va fi satisfacuta chiar in locul in care este localizat obiectul cercetarii, impreuna cu toate facilitatile necesare unei activitati de cercetare de top.
- Sustenabilitatea financiara a DANUBIUS-RI este una dintre cele mai importante probleme, care trebuie bine administrata, pentru succesul infrastructurii.

Exista nevoia unei comunicari mai bune. DANUBIUS-RI poate dezvolta si promova un set multimedia destinat educatiei de mediu. Acesta va acorda sustinere planificarii tematice a programelor de formare pentru o dezvoltare durabila.
Comunicarea, parteneriate imbunatatite si transfer de cunostinte sunt elemente-cheie care vor ajuta la dezvoltarea resursei umane in macro-regiunea Dunarii. Toate acestea trebuie furnizate de DANUBIUS-RI.

7. ANEXE

7.1. Analiza potentialului tehnic si stiintific relevant, existent in Regiunea Dunarii

7.1.1. Anexa 1 – Lista principalelor infrastructuri, programe si initiative din Regiunea Dunarii

MARINE ENVIRONMENT			
ESFRI Projects			
Project/Node	**Website**	**Member countries from the Danube Region**	**Description**
Lifewatch – E Science European Infrastructure for Biodiversity and Ecosystem research	http://www.lifewatch.eu/web/guest/home	Hungary Romania	**LifeWatch** is a European research infrastructure in development. The first services to users are planned for 2013. Users may benefit from integrated access to a variety of data, analytical and modeling tools as served by a variety of collaborating initiatives. Another service is offered with data and tools in selected workflows for specific scientific communities. In addition, LifeWatch will provide opportunities to construct personalized 'virtual labs', also allowing entering new data and analytical tools.
I3 (Networks of RI`S) – FP7 Projects			
EnviroGRIDS Building Capacity for a Black Sea Catchment Observation and Assessment System supporting Sustainable Development	http://envirogrids.net/	Bulgaria Hungary Romania Ukraine	With 30 partners distributed in 15 countries, the EnviroGRIDS project is contributing to the Global Earth Observation System of Systems (GEOSS) by promoting the use of web-based services to share and process large amounts of key environmental information in the Black Sea catchment (2.2 mio. km^2, 24 countries, 160 million inhabitants). The main aim of the project is to assess water resource in the past, the present and the future, according to different development scenarios. The objective is also to develop datasets that are compatible with the European INSPIRE Directive on spatial data sharing across Europe. The data and metadata gathered and produced on the Black Sea catchment will be distributed through the EnviroGRIDS geoportal. The challenge is to convince and help regional data holders to make available their data and metadata to a larger audience in order to improve our capacity to assess the sustainability and vulnerability of the environment.
MESOAQUA	http://mesoaqua.e	?	A network of leading MESOcosm facilities to advance the studies of future AQUAtic

	u/		ecosystems from the Arctic to the Mediterranean.
Eurofleets (and Eurofleets 2)	http://www.eurofleets.eu/np4/home.html	Bulgaria Romania	Aim: bringing together the EU research fleets to enhance their coordination and promote the cost effective use of their facilities. It is a research infrastructure project under the FP7.
SeaDataNet 2 Pan-European Infrastructure for Ocean & Marine Data Management	http://www.seadatanet.org/	Bulgaria Romania	SeaDataNet has developed an efficient distributed Marine Data Management Infrastructure for the management of large and diverse sets of data deriving from in situ and remote observation of the seas and oceans. Professional data centres, active in data collection, constitute a Pan-European network providing on-line integrated databases of standardized quality. The on-line access to in-situ data, meta-data and products is provided through a unique portal interconnecting the interoperable node platforms constituted by the SeaDataNet data centers. Data, value added products and dictionaries serve wide uses: e.g. research, model initialisation, industrial projects, teaching, marine environmental assessment.
Upgrade BlackSeaScene (and previous FP6 BlackSea Scene)	http://www.blackseascene.net/	Bulgaria Romania Ukraine	The UP-GRADE BS-SCENE project is an FP7 EU funded project running from 2009-2011 that is building and extending the existing research infrastructure (developed under FP6 project BlackSeaScene 1) with an additional 19 marine environmental institutes/organizations from the 6 Black Sea countries. Implementing FP6 RI SeaDataNet project standards regarding common communication standards and adapted technologies will ensure the datacenters interoperability. Main output will be on-line access to in-situ and remote sensing data, meta-data and products.
EAST-NMR	http://www.east-nmr.eu	Hungary Slovakia	Enhancing Access and Services to East European users towards an efficient and coordinated Pan-European pool of NMR (nuclear magnetic resonance) capacities to enable global collaborative research & boost technological advancement. Nuclear magnetic resonance (NMR) spectroscopy is a key technology for research in the modern Life Sciences, with an increasing impact on human health. This technology is unique in new areas of molecular systems biology providing detailed insight into protein-protein and protein-ligand interactions.
GROOM	http://www.groom-fp7.eu/doku.php	Germany	The objective of the GROOM project is to design a new European Research Infrastructure that uses underwater gliders for collecting oceanographic data. This new infrastructure shall be beneficial for a large number of marine activities and societal applications, which can be related to climate change, marine ecosystems, resources, or security and which rely on academic oceanographic research and/or operational oceanography systems. GROOM will define the scientific, technological, and legal framework of this European glider capacity. GROOM is a key project for building the required observatory network that would allow the Marine Strategy Framework Directive to be implemented. GROOM will develop in line with other European and international initiatives supporting

			marine in-situ observations, like in particular Euro-Argo, JERICO, and GOOS.
Joint Programming Initiative			
JPI OCEANS	http://www.jpi-oceans.eu/prognett-jpi-oceans/About_us/1253960389448	Germany Romania	The Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans) is a **coordinating and integrating platform**, open to all EU Member States and Associated Countries. In its role as a coordination platform, JPI Oceans will focus on making better and more efficient use of national research budgets, which represent 85% of the marine-maritime funding within Europe. One of the JPI's goals is to **develop joint research programs** in which countries can be involved on a voluntary basis (variable geometry). Participating countries will also decide what contribution to make: this may include institutional, project-related or new funding.
JPI Climate	http://www.jpi-climate.eu	Austria Germany	JPI Climate is a collaboration between 13 European countries to coordinate jointly their climate research and fund new transnational research initiatives. Transnational coordination of the research base aims to overcome research fragmentation, to make better use of precious public R&D resources and to facilitate cross border collaboration between top scientists. JPI Climate connects scientific disciplines, enables cross-border research and increases science-practice interaction. By doing this, it is expected that JPI climate significantly contribute to underpinning the European efforts to respond to climate change. JPI Climate: • aims to respond to the knowledge needs of policy and the European society at large to address climate change • provides a platform to align national research priorities according to a jointly agreed Strategic Research Agenda (SRA) with the aim of complementing and supporting initiatives at the European level (ERANET's, FP8, Climate KIC, ESFRI Projects) • facilitates the coordination, collaboration and exploitation of synergies in climate change research, learning and innovation while working against fragmentation and duplication of efforts • connecting different disciplinary approaches in natural and social sciences leading to interdisciplinary research efforts of higher quality and relevance • connecting top researchers and research groups from different European countries, leading to high quality and efficient research efforts, long term collaborations and a stronger global position • connecting scientific insights with the demands of policy makers, decision makers and other stakeholders from local to international levels, leading to more effective policies
Networks of Infrastructures and Users			
SedNet	http://www.sedne	Germany	SedNet is a European network aimed at incorporating sediment issues and knowledge into

	t.org/	Serbia	European strategies to support the achievement of a good environmental status and to develop new tools for sediment management. Our focus is on all sediment quality and quantity issues on a river basin scale, ranging from freshwater to estuarine and marine sediments.
ERVO, EU research Vessels Operators - Marine research Infrastructure Infobase	http://www.eurocean.org/np4/60 http://www.rvinfobase.eurocean.org/	Bulgaria Germany Romania	Contains information about every research vessel operated in EU (operator, area of operation, technical characteristics, contact details)
EMODNet	http://www.emodnet-physics.eu/	Bulgaria Germany Romania	The EMODnet Physical Parameters portals is aimed at providing layers of physical data and metadata available for use by public authorities, scientists and industry, and contribute towards the definition of an operational **European Marine Observation and Data Network** (EMODnet) and contribute to developing of the definition of the Global Monitoring for Environment and Security (GMES) marine core service. The portal is being developed by a European consortium and operated in a cooperation between EuroGOOS, its Regional components (ROOSs), and exploiting SeaDataNet and MyOcean infrastructures and services bringing together many marine data users and providers. The EMODnet Physical Parameters portal provides access to near real time and archived data series from fixed stations and ferry box lines in the European Sea and provides OGC services (WMS, WFS, and WCS) for data discovery, view and download.
Regional Infrastructures			
MARINEGEOHAZARD **1.EUXINUS network** **2.GeoPontica network**	www.geohazard-blacksea.eu	Bulgaria Romania	1. **EUXINUS** - the Black Sea regional early warning system to marine-geohazards – marine observatories **2. GeoPontica** network - the first on-line geodynamic surveillance network in the entire Black Sea region
Major Initiatives and Projects in the Danube Area and the Black Sea			
The Commission on the Protection of the Black Sea Against Pollution	http://www.blacksea-commission.org/	Bulgaria Romania Ukraine	The Commission on the Protection of the Black Sea Against Pollution (the Black Sea Commission or BSC) via its Permanent Secretariat is the intergovernmental body established in implementation of the Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention), its Protocols and the Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea (latest version adopted in 2009).
HERMES - Hotspot ecosystem research on the margins of	http://www.eu-hermes.net/intro.html	Germany Romania Ukraine	HERMES is designed to gain new insights into the biodiversity, structure, function and dynamics of ecosystems along Europe's deep-ocean margin. It represents the first major attempt to understand European deep-water ecosystems and their environment in an integrated

European seas			way by bringing together expertise in biodiversity, geology, sedimentology, physical oceanography, microbiology and biogeochemistry, so that the generic relationship between biodiversity and ecosystem functioning can be understood. Study sites will extend from the Arctic to the Black Sea and include open slopes, where landslides and deep-ocean circulation affect ecosystem development, and biodiversity hotspots, such as cold seeps, cold-water coral mounds, canyons and anoxic environments, where the geosphere and hydrosphere influence the biosphere through escape of fluids, presence of gas hydrates and deep-water currents. These important systems require urgent study because of their possible biological fragility, unique genetic resources, global relevance to carbon cycling and possible susceptibility to global change and man-made disturbances. Past changes, including catastrophic events, will be assessed using sediment archives. We will make estimates of the flow rates of methane from the geosphere and calculate how much is utilised by benthic communities, leaving the residual contribution to reach the atmosphere as a greenhouse gas. HERMES will enable forecasting of biodiversity change in relation to natural and man-made environmental changes by developing the first comprehensive pan-European margin Geographic Information System. This will provide a framework for integrating science, environmental modelling and socio-economic indicators in ecosystem management. The results will underpin the development of a comprehensive European Ocean and Seas Integrated Governance Policy enabling risk assessment, management, conservation and rehabilitation options for margin ecosystems.
Sea Basin Strategy: Black Sea	http://ec.europa.eu/maritimeaffairs/policy/sea_basins/black_sea/index_en.htm		The Black Sea is bordered by 6 countries - including EU members Bulgaria and Romania. Extensive dialogue and stakeholder involvement is vital for a coherent and coordinated approach to maritime issues in the area. A first dialogue was held in 2011 with Bulgarian and Romanian stakeholders, and since then the Commission has extended the dialogue to all Black Sea countries. ***Regional cooperation*** The Black Sea Synergy launched by the EU is an initiative for regional cooperation with and between the countries surrounding the Black Sea. It was designed as a flexible framework to ensure greater coherence and policy guidance while also inviting a more integrated approach. The EU also enjoys observer status in two regional organisations: • The Black Sea Economic Cooperation (BSEC) • The Commission for the Protection of the Black Sea Against Pollution (BSC, Bucharest Convention).
International Initiatives and UN Programmes			
GEO	http://www.earthobservations.org/		GEO was launched in response to calls for action by the 2002 World Summit on Sustainable Development and by the G8 (Group of Eight) leading industrialized countries. These high-level

	geoss_wa_tar.shtml		meetings recognized that international collaboration is essential for exploiting the growing potential of Earth observations to support decision making in an increasingly complex and environmentally stressed world. GEO is a voluntary partnership of governments and international organizations. It provides a framework within which these partners can develop new projects and coordinate their strategies and investments. As of 2013, GEO's Members include 89 Governments and the European Commission. In addition, 67 intergovernmental, international, and regional organizations with a mandate in Earth observation or related issues have been recognized as Participating Organizations. GEO is constructing GEOSS on the basis of a 10-Year Implementation Plan for the period 2005 to 2015. The Plan defines a vision statement for GEOSS, its purpose and scope, expected benefits, and the nine "Societal Benefit Areas" of disasters, health, energy, climate, water, weather, ecosystems, agriculture and biodiversity.
GEOSS	http://www.earthobservations.org/geoss.shtml		The Group on Earth Observations is coordinating efforts to build a Global Earth Observation System of Systems, or GEOSS. The Global Earth Observation System of Systems will provide decision-support tools to a wide variety of users. As with the Internet, GEOSS will be a global and flexible network of content providers allowing decision makers to access an extraordinary range of information at their desk. This 'system of systems' will proactively link together existing and planned observing systems around the world and support the development of new systems where gaps currently exist. It will promote common technical standards so that data from the thousands of different instruments can be combined into coherent data sets. The 'GEOPortal' offers a single Internet access point for users seeking data, imagery and analytical software packages relevant to all parts of the globe. It connects users to existing data bases and portals and provides reliable, up-to-date and user friendly information – vital for the work of decision makers, planners and emergency managers. For users with limited or no access to the Internet, similar information is available via the 'GEONETCast' network of telecommunication satellites. The Global Earth Observation System of Systems is simultaneously addressing nine areas of critical importance to people and society. It aims to empower the international community to protect itself against natural and human-induced disasters, understand the environmental sources of health hazards, manage energy resources, respond to climate change and its impacts, safeguard water resources, improve weather forecasts, manage ecosystems, promote sustainable agriculture and conserve biodiversity. GEOSS coordinates a multitude of complex and interrelated issues simultaneously. This cross-cutting approach avoids unnecessary duplication, encourages synergies between systems and ensures substantial economic, societal and environmental benefits.

GOOS	http://www.ioc-goos.org/	Romania Bulgaria	**The Global Ocean Observing System** GOOS is a permanent global system for observations, modelling and analysis of marine and ocean variables to support operational ocean services worldwide. GOOS provides accurate descriptions of the present state of the oceans, including living resources; continuous forecasts of the future conditions of the sea for as far ahead as possible, and the basis for forecasts of climate change.
Copernicus **The European Earth Observation Programme**	http://www.copernicus.eu/	It represents the European contribution to GOOS.	**Copernicus, previously known as GMES (Global Monitoring for Environment and Security), is the European Programme for the establishment of a European capacity for Earth Observation.** Copernicus is a European system for monitoring the Earth. Copernicus consists of a complex set of systems which collect data from multiple sources: earth observation satellites and *in situ* sensors such as ground stations, airborne and sea-borne sensors. It processes these data and provides users with reliable and up-to-date information through a set of services related to environmental and security issues... The services address six thematic areas: land, marine, atmosphere, climate change, emergency management and security. They support a wide range of applications, including environment protection, management of urban areas, regional and local planning, agriculture, forestry, fisheries, health, transport, climate change, sustainable development, civil protection and tourism. The main users of Copernicus services are policymakers and public authorities who need the information to develop environmental legislation and policies or to take critical decisions in the event of an emergency, such as a natural disaster or a humanitarian crisis. Based on the Copernicus services, many other value-added services can be tailored to more specific public or commercial needs. This will create new business opportunities. In fact, several economic studies so far have demonstrated a huge potential for job creation, innovation and growth. The Copernicus programme is coordinated and managed by the European Commission. The development of the observation infrastructure is performed under the aegis of the European Space Agency for the space component and of the European Environment Agency and the Member States for the in situ component. The provision of Copernicus services is based on the processing of environmental data collected from two main sources: • A space component, which consists of several Earth observation satellites; • An *in situ* component, which consist of a multitude of sensors on the ground, at sea or in the air.

			The European Space Agency (ESA) is responsible for the space component and coordinates the delivery of data from upwards of 30 satellites. The European Environment Agency (EEA) is responsible for the development of the *in situ* component and coordinates the gathering of data coming from both European and non-European organisations.
IOC – UNESCO	http://ioc-unesco.org/		**Intergovernmental Oceanographic Commission (IOC) of UNESCO** is the United Nations body for ocean science, ocean observatories, ocean data and information exchange, and ocean services such as Tsunami warning systems. Its mission is to promote international cooperation and to coordinate programmes in research, services and capacity building to learn more about the nature and resources of the oceans and coastal areas, and to apply this knowledge to improved management, sustainable development and protection of the marine environment and the decision making processes of States.
IODE in IOC UNESCO	http://www.iode.org/		The programme "International Oceanographic Data and Information Exchange" (IODE) of the "Intergovernmental Oceanographic Commission" (IOC) of UNESCO was established in 1961. Its purpose is to enhance marine research, exploitation and development, by facilitating the exchange of oceanographic data and information between participating Member States, and by meeting the needs of users for data and information products.
GEF	http://www.thegef.org/gef/whatisgef		**The Global Environment Facility** (GEF) unites 183 countries in partnership with international institutions, civil society organizations (CSOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives. An independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. Since 1991, GEF has achieved a strong track record with developing countries and countries with economies in transition, providing $11.5 billion in grants and leveraging $57 billion in co-financing for over 3,215 projects in over 165 countries. Through its Small Grants Programme (SGP), the GEF has also made more than 16,030 small grants directly to civil society and community based organizations, totaling $653.2 million.
UNEP	http://www.unep.org/		United Nations Environment Programme UNEP, established in 1972, is the voice for the environment within the United Nations system. UNEP acts as a catalyst, advocate, educator and facilitator to promote the wise use and sustainable development of the global environment. UNEP work encompasses: • Assessing global, regional and national environmental conditions and trends • Developing international and national environmental instruments

			• Strengthening institutions for the wise management of the environment **Mission** "To provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations." **Mandate** "to be the leading global environmental authority that sets the global environmental agenda, that promotes the coherent implementation of the environmental dimensions of sustainable development within the United Nations system and that serves as an authoritative advocate for the global environment" Priorities: Climate Change, Disaster and conflicts, Ecosystem management, Environmental Governance, Harmful Substances, Resource Efficiency.
IUCN	http://www.iucn.org/about/		International Commission for Conservation of Nature The International Union for Conservation of Nature is the world's oldest and largest global environmental organization. **IUCN at a glance** • Founded in 1948 as the world's first global environmental organization • Today the largest professional global conservation network • A leading authority on the environment and sustainable development • More than 1,200 member organizations including 200+ government and 900+ non-government organizations • Almost 11,000 voluntary scientists and experts, grouped in six Commissions in some 160 countries • IUCN's work is supported by over 1,000 staff in 45 offices and hundreds of partners in public, NGO and private sectors around the world. The Union's headquarters are located in Gland, near Geneva, in Switzerland. • A neutral forum for governments, NGOs, scientists, business and local communities to find practical solutions to conservation and development challenges • Thousands of field projects and activities around the world • Governance by a Council elected by member organizations every four years at the IUCN World Conservation Congress • Funded by governments, bilateral and multilateral agencies, foundations, member organizations and corporations • Official Observer Status at the United Nations General Assembly
Vessels and Boats			

Mare Nigrum multidisciplinary research Vessel	http://www.geoecomar.ro/website/nave-cercetare-mare-nigrum.html	Romania (Black Sea)	Mare Nigrum is the multidisciplinary marine research vessel belonging to the Romanian National Research and Development Institute for Marine Geology and Geo-Ecology GEOECOMAR. General characteristics: Length-82 m. Breadth -13.6 m Max draft -5 m Gross tonnage -2495 t Engine: 2 engines of 1160 HP Electrical power : 2x320 kVA, 1x350 kVA, 1x50 kVA; Laboratories on board: Biology Geochemistry Geophysics (Magnetometry and Gravimetry) Seismo-acoustic Hydrology Gas measurements Tomography Computer room Accommodation facility: 25 places (permanent crew) 25 places (scientists on board) **Marine equipments:** • Multibeam bathymetric system SEABEAM 1050 Elak Nautik; • Seism - acoustics CHIRP Star Full Spectrum; • Magnetometer Geometrics G-87; • On-board (GMNKM) and bottom (GDK) gravimeters; • ROV (1000 m water deep); • Sub-bottom profiler; • Side Scan sonar. **Geochemical, Geoecological and Sedimentological equipments:** • CTD SBE 25 Sealogger ; • Gravity and piston corers; • Multi-corer Mark II-400; • Grab samplers; • Nets for biology; **Deck equipments:**

			• Hydraulically Winch 10 tf; • Electrical Winch 8 tf; • CTD Winch; • ROV winch; • Grab sampler winch; • Crane 3 tf/15 m; • A – Frame on aft ship.
Akademik		Bulgaria (Black Sea)	Akademik is the Oceanographic Multipurpose Research Vessel belonging to IO-BAS - Institute of Oceanology - Bulgarian Academy of Science. General characteristics: Length: 55.5 m Beam: 9.80 m Draft: 4.80 m Gross tons: 905 Power: 1000 HP Range 7500 n.mi Endurance: 35 days Cruise speed: 9.5 kt Max. speed: 10.5 kt Crew: 22 Scientists: 20 Equipment on board: Fixed equipment Navigation and communication Nav. equip: Radar Loran Decca SatNav Gyro DopLog Acoustic Echosounders for scientific research: 12kHz 27kHz Oceanographic Oceanographic winches: number: 3 Gantry Crane Electronic data processing equipment permanently available on board
COASTAL ENVIRONMENT			
I3 (Networks of RI`S) – FP7 Projects			

HYDRALAB IV Infrastructure Network	http://www.hydralab.eu	Hungary Romania	The co-ordinated and integrated approach of HYDRALAB aims at structuring the access to unique and costly hydraulic and ice engineering research infrastructures in the European Research Area. The network of HYDRALAB is unique in the hydraulic research community and has large experience in co-operating since its start in 1997. It began by informing and co-ordinating the activities of the partners in HYDRALAB I and II, and via strong collaboration in HYDRALAB III we will now realize further integration of our research services in Europe in HYDRALAB IV. Research in this infrastructures deals with complex questions regarding the interaction of water with environmental elements, sediment, structures and ice and goes beyond just hydraulic research: hence we have adopted the theme More than water, with the following elements: water and environmental elements (focusing on ecology and biology); water and sediment; water and structures; water and ice.
JERICO – Towards a joint EU research infrastructure network for coastal observatories	http://www.jerico-fp7.eu/	Bulgaria Germany	Around European coastal seas, the number of marine observing systems is quickly increasing under the pressure of both monitoring requirements and oceanographic research. Present demands for such systems include reliable, high-quality and comprehensive observations, automated platforms and sensors systems, as well as autonomy over long time periods. In-situ data collected, combined with remote sensing and models output, contribute to detect, understand and forecast the most crucial coastal processes over extensive areas within the various national and regional marine environments. Coastal observations are an important part of the marine research puzzle of activities and applications. However significant heterogeneity exists in Europe concerning technological design of observing systems, measured parameters, practices for maintenance and quality control, as well as quality standards for sensors and data exchange.
Pegaso	http://www.pegasoproject.eu	Romania (Danube Delta is a Pegaso pilot site) Ukraine	Many efforts have been deployed for developing **Integrated Coastal Zone Management** in the **Mediterranean and the Black Sea**. Both basins have, and continue to suffer severe environmental degradation. In many areas this has led to unsustainable trends, which have impacted, on economic activities and human well-being. An important progress has been made with the launch of the **ICZM Protocol for the Mediterranean Sea** in January 2008. The main goal of the PEGASO project is to construct a shared Integrated Coastal Zone Management (ICZM) Governance Platform with scientists, users and decision-makers linked with new models of governance. **Spatial Data Infrastructure for the Mediterranean and Black Seas** The PEGASO project is an example initiative for the Mediterranean and Black Seas that aims to build a shared ICZM Governance Platform with scientists and end-users, linked with new models of governance. The **PEGASO ICZM Platform** will be **supported by** the development

			of a **Spatial Data Infrastructure (SDI)** and the suite of sustainability assessment tools required for making multi-scale integrated assessments in the coastal zone.
RISES – AM Responses to coastal climate change: Innovative Strategies for high End Scenarios -Adaptation and Mitigation	http://risesam.eu/	Germany Romania	Coastal areas concentrate vulnerability to climate change due to high levels of population, economic activity and ecological values. Because of that RISES-AM addresses the economy-wide impacts of coastal systems to various types of high-end climatic scenarios (including marine and riverine variables). The emphasis is on the advantages of flexible management with novel types of coastal interventions (e.g. "green" options) within an adaptive pathway whose tipping points will be identified/quantified in the project. The extended/improved suite of models will be applied across scales and focusing on the most vulnerable coastal archetypes such as deltas, estuaries, port cities and small islands. This will lead to a motivated analysis of the synergies and trade-off between mitigation and adaptation, including what level and timing of climate mitigation is needed to avoid social, ecological and economic adaptation tipping points in coastal areas. The project shall evaluate the direct and indirect costs of high-end scenarios (e.g. the increasing demand for safety under increasingly adverse conditions) for coasts with/without climate change and contribute to determining which policy responses are needed at the European and global levels in the context of international climate discussions. The project will finally transfer results to authorities, users and stakeholders from all economic sectors converging in coastal zones, including the climate research community.
FAST - Foreshore Assessment using Space Technology	www.fast-space-project.eu	Romania	Reducing flood risk is now one of the most pressing challenges facing European coastal managers. Sea level rise, changing weather patterns and increasing coastal populations, exacerbate this challenge and necessitate innovative approaches towards coastal management. Natural environments provide the ecosystem service of 'natural flood defence'. An innovative, sustainable and cost reduction approach for coastal management strategies is the incorporation of natural environments into flood risk management. However, to incorporate this approach into management schemes, we need to know more about the precise mechanisms of energy dissipation by coastal ecosystems; how these processes 'scale up' from individual sites to larger foreshores seaward of coastal defences; and how we can incorporate such information into accessible assessment methods for coastal managers. **FAST** is a multi-disciplinary project that will help providing know-how to include natural ecosystems within flood safety solutions. The *objective* of the **FAST project** is to utilise field measurements and satellite data - from eight different foreshores in four different countries (The Netherlands, U.K. Romania and Spain) - to develop a software tool. The resulting software tool will allow water managers and consultants to determine the role of vegetated foreshores in reducing flood and erosion risk at their landward margins.
Vessels and Boats			

Istros research ship	http://www.geoecomar.ro/website/nave-cercetare-istros.html	Romania (Lower Danube Danube Delta The coastal zone of Romania)	"ISTROS" is the coastal and river research ship belonging to the Romanian National Research and Development Institute for Marine Geology and Geo-Ecology GEOECOMAR. General characteristics: Displacement – 147,8 t Length – 32 m Width – 6,80 m Engine: – 2 engines type Doosan 350 CP each 3 electricity generators; no need for electricity at docking sites Fuel consumption: 90 l/h Cruising speed: 18 km/h downstream and 10 km/h upstream Draft theoretical: 1,08 m (practically 1,40 m) Common navigation area so far: Danube (from Regensburg to Sulina), Danube Delta, the coastal area of Romania. Accommodation facility: 10 places (2 single cabins and 4 double cabins). There is one laboratory on-board: (chemistry lab); possibility to use dining room for laboratory work. Storage facilities – 1 storage room ca. 3 x 2 x 2.5 m; opening ca. 1.2 x 0.65 m; 1 storage room ca. 2 x 2 x 2 m; opening ca. 0.65 x 0. 65 m. Cooling capacities: freezer 200 l, fridge 180 l with freezer 20 l, fridge 180 l; availability of 15 kW additional cooling capacity; space for at least 6 fridges and 2 freezers for storage of samples. Sitting capacity in the dining room: minimum 18 persons. Possibility to provide power and fuel for other ships in case of emergency. Equipments for launching measuring devices: - A frame aft - 2 winches on the sides - 1 oceanographical winch to the aft Other available equipment: - Equipment for river and marine navigation: radar (Simrad CX44), GPS (Simrad CX33), transponder AIS, radiostation; - Rescue equipment; - The ship has a large bow bridge, useful as a working place; - Two motor boats with engine, capacity 4 researchers and driver; two drivers from the crew of Istros available at each sampling site; - Short range radio transmission devices (walkie talkie) for the two motorboats;

			Crew: - Permanent: 7 pers. - Scientific: 10 pers. - Maximum capacity of passengers: 12 pers.
Carina research boat		Romania (Danube Danube Delta Romanian coastal area of the BS)	"Carina" is the coastal and river research boat belonging to the Romanian National Research and Development Institute for Marine Geology and Geo-Ecology GEOECOMAR. Carina is used for areas where the access of Istros or Mare Nigrun (marine research vessel of Romania) is restricted or impossible (e.g. water depth). Technical characteristics: 6m long Diesel Engine of 150 HP It can accommodate up to 6 people.
Others Types of Projects/Possible Nodes			
PLANCOAST - Spatial Planning in ICZM	http://www.plancoast.eu/	Bulgaria Croatia Germany Romania Ukraine	PLANCOAST was an INTERREG IIIB NP CADSES Project with the aim to develop the tools and capacities for an effective integrated planning in coastal zones and maritime areas in the Baltic, Adriatic and Black Sea regions. Introduced the completely new spatial planning instrument Maritime Planning Linked Integrated Coastal Zone Management (ICZM) and Maritime Planning with the processes of statutory spatial planning in selected number of pilot projects Spread the use of modern geographical information systems (GIS) for an effective transnational planning. Contributed to the creation and implementation of EU policy on coastal zones and maritime areas, such as the Green Book and Blue Book, and led to creation of numerous national laws and strategies. PlanCoast had 16 partners representing the spatial planning departments or responsible regional authorities from Albania, Bosnia–Herzegovina, Bulgaria, Croatia, Germany, Italy, Montenegro, Poland, Romania, Slovenia and Ukraine." Start developing and implementing the tools and procedures for the brand new discipline of Maritime Spatial Planning in each participating country. These tools should comply to international standards and at the same time reflect the local and regional needs.
Globolakes	http://www.globolakes.ac.uk/	Romania (Razelm was included in the network)	GloboLakes is a five year research programme investigating the state of lakes and their response to climatic and other environmental drivers of change at a global scale through the realisation of a near-real time satellite based observatory with archive data processing to produce a 20-year time series, of observed ecological parameters and lake temperature supported by linked auxiliary data on catchment land-use and meteorological forcing. LIMNADES (Lake Bio-optical Measurements and Matchup Data for Remote Sensing) is an

			initiative to centralize data of ground bio-optical measurements of worldwide lakes through voluntary cooperation across the international scientific community.
Integrated water resources and coastal zone management in European lagoons in the context of climate change	http://lagoons.web.ua.pt/	Ukraine	The environmental issue of concern of the LAGOONS project is the anthropogenic deterioration and climate change impacts (especially the effects of extreme weather event) on surface water and lagoons ecosystems. The main objective of the LAGOONS project is to contribute to a science-based seamless strategy – in an integrated and coordinated fashion – of the management of lagoons seen under the land-sea and science-policy-stakeholder interface; i.e., the project seeks to underpin the integration of the EU Water Framework Directive, Habitat Directive, the EU's ICZM Recommendation, and the EU Marine Strategy Directive.
FRESH WATER ENVIRONMENT			
ESFRI Projects			
Project/Node	**Website**	**Member countries from the Danube Region**	**Description**
Lifewatch – E Science European Infrastructure for Biodiversity and Ecosystem research	http://www.lifewatch.eu/web/guest/home	Hungary Romania	**LifeWatch** is a European research infrastructure in development. The first services to users are planned for 2013. Users may benefit from integrated access to a variety of data, analytical and modeling tools as served by a variety of collaborating initiatives. Another service is offered with data and tools in selected workflows for specific scientific communities. In addition, LifeWatch will provide opportunities to construct personalized 'virtual labs', also allowing to enter new data and analytical tools.
I3 (Networks of RI`S) – FP7 Projects			
EnviroGRIDS Building Capacity for a Black Sea Catchment Observation and Assessment System supporting Sustainable Development	http://envirogrids.net/	Bulgaria Hungary Romania Ukraine	With 30 partners distributed in 15 countries, the EnviroGRIDS project is contributing to the Global Earth Observation System of Systems (GEOSS) by promoting the use of web-based services to share and process large amounts of key environmental information in the Black Sea catchment (2.2 mio. km^2, 24 countries, 160 million inhabitants). The main aim of the project is to assess water resource in the past, the present and the future, according to different development scenarios. The objective is also to develop datasets that are compatible with the European INSPIRE Directive on spatial data sharing across Europe. The data and metadata gathered and produced on the Black Sea catchment will be distributed through the EnviroGRIDS geoportal. The challenge is to convince and help regional data holders to make available their data and metadata to a larger audience in order to improve our capacity to assess

			the sustainability and vulnerability of the environment.
MESOAQUA	http://mesoaqua.eu/	?	A network of leading MESOcosm facilities to advance the studies of future AQUAtic ecosystems from the Arctic to the Mediterranean.
ExpeER Ecosystem Research	http://www.expeeronline.eu/	Austria Hungary Romania Serbia	ExpeER is a major European Infrastructure project (2010-2014) in the field of Ecosystem Research. ExpeER will, for the first time, federate existing national infrastructures, improve their research capacity whilst at the same time facilitating access to those key experimental and observational platforms as well as analytical and modelling facilities for the benefit of the international research community.
EAST-NMR	http://www.east-nmr.eu	Hungary Slovakia	Enhancing Access and Services to East European users towards an efficient and coordinated Pan-European pool of NMR (nuclear magnetic resonance) capacities to enable global collaborative research & boost technological advancement. Nuclear magnetic resonance (NMR) spectroscopy is a key technology for research in the modern Life Sciences, with an increasing impact on human health. This technology is unique in new areas of molecular systems biology providing detailed insight into protein-protein and protein-ligand interactions.
ClimateWater - Bridging the gap between adaptation strategies of climate change impacts and European water policies	http://www.climatewater.org/project.php	Austria Germany Hungary Romania	The overall objective of the ClimateWater project is to study European and international adaptation measures and strategies related to climate change impacts and how these are taken into account in water policies. The project will formulate a coherent framework on adaptation strategies of climate change impacts on water resources, water cycling and water uses of the society and nature with special regard to those that water policy has to take into account when considering climate change impacts. The project will bring together scientific and policy experiences on the existing and/or missing links between climate change and water management and will help to: • identify research needs on climate change impacts on water cycle and resources, •develop and apply methodologies for adaptation measures to climate change, •develop scenarios of water demand and to potential implementation on water policies.
PSI-Connect* (FP7, GA 226915): Policy Science Interactions:- Connecting science and policy through innovative knowledge brokering	http://public.cranfield.ac.uk/e101732/psi%20connect/documents/d3.2_national_level.pdf http://www.psiconnect.eu/	Germany Hungary	**Bridging the policy-science gap** The inherent ecological and societal complexity of water management challenges means that management decisions are always challenged by a lack of factual knowledge. This situation is exacerbated by rapidly changing physical and socio-economic boundary conditions such as climate change. Although much new knowledge on the issue of climate change impacts on water resources has been generated, these understandings remain poorly exploited by policy makers and water managers. In recent years, considerable effort has been devoted to designing approaches that support dialogue between science and policy communities in an attempt to relate science, experience and insight to policy. Knowledge

			brokering instruments such as role playing, simulation games, group model building, soft systems analysis and futures visioning, offer opportunities to increase the effectiveness of these interactions, thus facilitating a discourse on the framing of policy issues, collaborative learning as well as the exchange and co-creation of relevant knowledge. PSI-connect is a three-year collaborative project funded under EC FP7. Through experimentation with and development of innovative knowledge brokering instruments, PSI-connect aims to improve the quality and value of interactions between the science base and river basin managers and policy makers in the field of climate change impacts on river systems. PSI-connect will: • generate insight into how the science policy gap can be bridged in the context of water management and climate change. • develop and test different types of knowledge brokering instruments in concrete policy situations at the European, national and regional level. • provide descriptions of different types of knowledge brokering instruments and conditions for their successful application. • introduce different science and policy actors to knowledge brokering instruments through case studies, thus encouraging a further dissemination of the tools to a wider audience. • The long term impact of the project will be ensured through initiation of problem or sector specific forums for information exchange and deliberation, the Knowledge Brokerage Collectives.
River Information Services for Transport & Logistics (RISING)	http://www.rising.eu/web/guest;jsessionid=54C646109495289362536A502C99A548	Austria Croatia Germany Hungary Romania Serbia Slovakia	RISING, a project co-financed by the European Commission within the 7th Framework Programme for Research and Technological Development, will investigate how the efficiency of co-modal transport logistics processes using Inland Waterway Transport (IWT) can be increased. This will be achieved by providing seamless traffic and transport-related information as well as standardized IT interfaces to transport logistics actors and players.
Joint Programming Initiative			
JPI Waters	http://www.waterjpi.eu	Austria Germany Hungary	The JPI "***Water challenges for a changing world***" deals with research in the field of water and hydrological sciences. The availability of water in sufficient quantities and adequate quality is indeed a public issue of high priority and addresses a pan-European and global environmental

		Moldova Romania	challenge.
JPI Climate	http://www.jpi-climate.eu	Austria Germany	JPI Climate is a collaboration between 13 European countries to coordinate jointly their climate research and fund new transnational research initiatives. Transnational coordination of the research base aims to overcome research fragmentation, to make better use of precious public R&D resources and to facilitate cross border collaboration between top scientists. JPI Climate connects scientific disciplines, enables cross-border research and increases science-practice interaction. By doing this, it is expected that JPI climate significantly contribute to underpinning the European efforts to respond to climate change. JPI Climate: • aims to respond to the knowledge needs of policy and the European society at large to address climate change • provides a platform to align national research priorities according to a jointly agreed Strategic Research Agenda (SRA) with the aim of complementing and supporting initiatives at the European level (ERANET's, FP8, Climate KIC, ESFRI Projects) • facilitates the coordination, collaboration and exploitation of synergies in climate change research, learning and innovation while working against fragmentation and duplication of efforts • connecting different disciplinary approaches in natural and social sciences leading to interdisciplinary research efforts of higher quality and relevance • connecting top researchers and research groups from different European countries, leading to high quality and efficient research efforts, long term collaborations and a stronger global position • connecting scientific insights with the demands of policy makers, decision makers and other stakeholders from local to international levels, leading to more effective policies
Networks of Infrastructures and Users			
Delta Alliance – A Global Network for the Resilience of Deltas	http://www.delta-alliance.org/	Romania (Danube Delta Wing)	Delta Alliance is an international knowledge-driven network organization with the mission of improving the resilience of the world's deltas. With increasing pressure from population growth, industrialization and a changing climate, it is more important than ever that these valuable and vulnerable locations increase their resilience to changing conditions. Delta Alliance brings people together who live and work in deltas. They can benefit from each other's experience and expertise and as such contribute to an increased resilience of their delta region.
EurAqua	http://www.euraq	Austria	EurAqua is the European Network of Freshwater Research Organizations. The aim of EurAqua

	ua.org/	Germany Hungary	is to contribute substantially to the development of European freshwater science and technology and its dissemination on a European scale, thus having a significant input on the development of the scientific and economic basis of European water management. The EurAqua Partner institutions are leading, generally public, freshwater research institutions in the Member States of the European Union plus Norway and Switzerland. They extensively support national policies as well as water business. Within the country, the EurAqua members are closely connected to other relevant institutions.
SedNet	http://www.sednet.org/	Germany Serbia	SedNet is a European network aimed at incorporating sediment issues and knowledge into European strategies to support the achievement of a good environmental status and to develop new tools for sediment management. Our focus is on all sediment quality and quantity issues on a river basin scale, ranging from freshwater to estuarine and marine sediments.
BioWetMan: A science based approach to understand biodiversity driven functions and	http://www.ibiol.ro/man/wkp2009a/Sandu_BIOWETMAN_Feb2009.pdf	Austria Bulgaria Croatia Romania	The aim of the proposal is to initiate a network of scientists and wetland managers for improving wetland management by using an integrated scientific approach based on the role of biodiversity for ecosystem services. The preparation of a proposal for a research project can be one of the results of the established network. The core aim of the network is to investigate and elucidate the role of biodiversity for water quality and other ecosystem services, thus, leading to potential answers how ecosystem functions can improve water quality and nature conservation issues related to WFD and human uses. Aim and objectives: • To investigate the role of biodiversity in water quality improvement and other ecosystem services, thus, leading to potential answers how wetlands functions can support the implementation of WFD and human needs • To select case studies and their pressures –evaluate impact situation and the urgent needs related to ecosystem services, especially in the context of climate change • To initiate a network of scientists and wetland managers for improving wetland management on a larger scale by using an integrated scientific approach • To increase knowledge and know-how exchange within this network in order to provide useful scientific tools to the decision makers for a sustainable management of Danubian wetlands
Major Initiatives and Projects in the Danube Area			
ICPDR – International Commission for the Protection of the Danube River	http://www.icpdr.org/main/	Austria Bosnia and Herzegovina Bulgaria	The International Commission for the Protection of the Danube River (ICPDR) is a transnational body, which has been established to implement the Danube River Protection Convention. The International Commission for the Protection of the Danube River (ICPDR) works to ensure the sustainable and equitable use of waters and freshwater resources in the Danube

		Croatia Czech Republic Germany Hungary Moldova Montenegro Romania Serbia Slovakia Slovenia Ukraine	River Basin. The work of the ICPDR is based on the Danube River Protection Convention, the major legal instrument for cooperation and trans-boundary water management in the Danube River Basin.
DABLAS	http://www.icpdr.org/main/activities-projects/dablas	Austria Bosnia and Herzegovina Bulgaria Croatia Czech Republic Germany Hungary Moldova Montenegro Romania Serbia Slovakia Slovenia Ukraine	The DABLAS (Danube - Black Sea) Task Force is an example of providing a platform between International Funding Institutions, donors and beneficiaries to support cooperation and to leverage investment projects for the protection of water and water-related ecosystems of the Danube and Black Sea. The **Danube Black Sea Task Force (DABLAS)** was set up in 2001 with the aim to provide a platform for cooperation to ensure the protection of water and water-related ecosystems in the Danube and the Black Sea. This was in response to a Communication adopted by the European Commission in 2001, which highlighted priority actions required to improve the environmental situation in the region.
IAD	http://www.iad.gs/	Austria Bulgaria Czech republic	The International Association for Danube Research (IAD) was founded in 1956 and is the longest existing international scientific network in the Danube Region. IAD is an Association according to Austrian law with the goal of promoting and coordinating activities in the fields of limnology, water management, water protection and sustainable development in the Danube

		Croatia Germany Hungary Moldavia Romania Serbia Slovakia Ukraine	River basin (current structure and contact).
Danubia	http://www.gloWa-danube.de/eng/projekt/projekt.php	Germany (GLOWA project)	Integrated simulation model for the climate change impact on activities related to the Upper Danube.
ALSO DANUBE 2000-2003	http://www.alsodanube.at/	Austria Germany Romania Slovakia	ALSO DANUBE (Advanced Logistic Solutions for Danube Waterway) was a Research and Demonstration project within the 5th Framework Programme of the European Union. The overall objective of ALSO DANUBE was to increase significantly the use of inland waterway as a key transport mode within intermodal door-to-door logistic chains, focusing on the Danube axis. Therefore, ALSO DANUBE aimed to: • develop and implement an advanced European concept to manage intermodal transport chains with inland navigation as core transport mode • set up and run highly integrated logistic networks and operational platforms to enlarge the current range of logistic services • integrate advanced traffic and transport management systems • introduce new systems and technologies in the area of data exchange and communication • create independent logistic information and communication services • stimulate the extension of waterway transport relations to port hinterland and combined cargo • improve the efficiency of Danube transport which shall contribute to the development of the Danube waterway as a backbone for European transports, promoting the sustainable integration of the accession countries into the European Union
Danubeparks - The Danube River Network of Protected Areas	http://www.danubeparks.org/	Bulgaria Germany Hungary Moldavia Romania	The Protected Areas along the Danube preserve and restore the most valuable habitats of this international river, thus safeguarding an important part of Europe's natural heritage for future generations. Cross-border and transnational cooperation is an indispensable part of this work; nature doesn't recognise state borders, so nature protection needs cooperation across borders as

		Serbia Slovakia (17 protected areas along the Danube, from its source to the Danube Delta)	well if results are to be achieved. Therefore, DANUBEPARKS – the Danube River Network of Protected Areas – was founded in April 2007 through the signing of the Declaration of Tulcea. Eight protected areas were among the founders of this network, and many more joined their work during the early years. The goal is to integrate all Protected Area administrations along the Danube as well as the bigger tributaries (e.g. Prut, Sava, Tisza, Morava, etc.),which share the same problems and are therefore able to solve these issues more efficiently by close cooperation. ***Aims of the Network*** Based on the principles of the Ramsar Convention and the Convention and Co-operation for the Protection and Sustainable Use of the Danube River (Sofia, 1994), the Declaration of Tulcea solidifies the aims of the Network: • enhance nature conservation of Danube River Protected Areas • manage Danube Protected Areas wisely • exchange and promote expertise in management • improve knowledge of the ecological status of the river, as well as the the economic, social and environmental impacts and the management of the Danube Protected Areas • take actions for the prevention, control and reduction of pollution in the floodplains and wetlands in the Danube Basin • promote awareness of the international importance of the Danube River • promote sustainable development • influence the implementation and future development of public policies The Declaration of Vienna, signed by twelve partners on the occasion of the Kick-Off Event of the first joint transnational project, further details these aims as well as the means of cooperation.
Danube Reference Data and Service Infrastructure DRDSI Pilot Project	http://7fp.mon.bg/upload/docs/Danube_RDSI_Pilot_Project_Final.pdf	NA	RATIONALE AND OBJECTIVES The EU Strategy for the Danube Region (EUSDR) relies on an integrated approach to encourage better policy development and the alignment of funding and resources through concrete actions and projects. Since the Danube countries share a common territory and face interrelated crossborder issues, the Strategy aims to propose common solutions to the challenges faced by these countries. However, to propose such solutions, policy makers need first to be able to access clear and comparable information and understand better the issues involved. Many stakeholders have been collecting data for several years at the regional, national and local levels but at the moment there is still no common access point for harmonised data covering a wide range of scientific issues and encompassing the whole Danube Region. Now is the time to fill this gap taking advantage of the investment made by

			Member States to implement INSPIRE and recent progresses on ICT standardisation. For this reason, the JRC with the support of scientific partners of the Danube countries launched this project to develop a Danube Data and Services Infrastructure (DRDSI) that will facilitate access to comparable and harmonised datasets on various issues related to the Danube Region. Thanks to its cross cutting nature, this Infrastructure will contribute to the holistic scientific approach needed to tackle the interrelated and interdependent challenges which the Danube Region is facing. The DRDSI project was proposed as one of the flagship actions of Priority Area 07 "To develop the Knowledge Society (research, education and ICT)" of the EUSDR and is mentioned in the Roadmap for the implementation of this Priority Area. In particular the Priority Area 7 Progress Report was referring to the following recommendation:"Need to obtain a better overview of all research, initiatives and resources which are available and to gather the existing research results on the Danube Region in a structured and harmonised data set which could [be] used by policy makers across the Danube Region and will serve as a starting ground for the launch of large scale projects in the future". The recent report (COM(2013) 181 8/4/2013) from the Commission on the progresses made in the implementation of the EUSDR pinpoints the DRDSI initiative as one of the new projects contributing to the strengthening of the Danube Region.
Danube Floodrisk	http://www.danube-floodrisk.eu/2009/11/about/	Austria Bulgaria Croatia Hungary Moldavia Romania Slovakia Ukraine	The DANUBE FLOODRISK project focuses on the most cost-effective measures for flood risk reduction: risk assessment, risk mapping, involvement of stakeholders, risk reduction by adequate spatial planning. Risk reduction in large international river basins can only be achieved through transnational, interdisciplinary and stakeholder oriented approaches within the framework of a joint transnational project. Practice has shown that starting this kind of cooperation is extremely difficult, due to practical, political and financial reasons. If incentives exist, like the transnational cooperation programme, the start up can be successful. The long term process will be self-running after the starting phase. The project will bring together scientists, public servants, NGOs and stakeholders who develop jointly a scalable system of flood risk maps for the Danube River floodplains. Transnational methodology and models will be defined and implemented for flood risk assessment and mapping. This results in proposals for flood mitigation measures, adjustments of spatial development plans, assessment tools for economic development in flood plains and raised awareness of flood risk of stakeholders, politicians, planners and the public. Infrastructures at risk like industry, power stations and supply infrastructure will be considered in the project. Partners: 19 institutions all along the Danube countries, central public bodies, universities, research institutes and operational agencies, NGOs are implicated in the project. Lead partner

			is the Ministry of Environment, Romania.
Others Types of Projects/Possible Nodes			
LTER Europe	http://www.lter-europe.net/	Austria Bulgaria Germany Hungary Romania (Danube Delta and Braila Island) Serbia Slovakia	Long-Term Ecosystem Research (LTER) is an essential component of world wide efforts to better understand ecosystems. This comprises their structure, functions, and response to environmental, societal and economic drivers as well as the development of management options. For the first two decades of its existence LTER built on natural sciences. The ongoing re-design of LTER aims at expanding its scope to the human dimension. Strongly coupled and integrated socio-ecological systems are driven by economic, cultural and environmental forces likewise. Their investigation requires a new generation of socio-economic and ecological research (LTSER) with adequate infrastructure. LTER-Europe is a network of: ▪ National networks and the European contribution to the global International Long Term Ecological Research (ILTER) with over half of the ILTER members belonging to LTER-Europe ▪ Research infrastructures (LTER sites and LTSER platforms forming national networks) ▪ Institutions involved in ecological research across the continent and aiming at a virtual European ecological research institute ▪ Researchers in natural sciences, sociology and economy ▪ Scientific site co-ordinators and research platform managers ▪ Long-term data ▪ Research projects ▪ Support for communication and lobbying.
WISER – Water bodies in Europe: integrative systems to assess ecological status and recovery Integrated Project to Evaluate the Impacts of Global Change on European Freshwater Ecosystems Integrated Project to Evaluate the Impacts of Global	http://www.wiser.eu/programme/	Austria Bulgaria Germany	WISER will support the implementation of the Water Framework Directive (WFD) by developing tools for the integrated assessment of the ecological status of European surface waters (with a focus on lakes and coastal/transitional waters), and by evaluating recovery processes in rivers, lakes and coastal/transitional waters under global change constraints. The project will (1) analyse existing data from more than 90 databases compiled in previous and ongoing projects, covering all water categories, Biological Quality Elements (BQEs) and stressor types and (2) perform targeted field-sampling exercises including all relevant BQEs in lakes and in coastal/ transitional waters. New assessment systems will be developed and existing systems will be evaluated for lakes and coastal/transitional waters, with special focus on how uncertainty affects classification strength, to complete a set of assessment methodologies for these water categories. Biological recovery processes, in all water

Change on European Freshwater Ecosystems			categories and in different climatic conditions, will be analysed, with focus on mitigation of hydromorphological and eutrophication pressures. Large-scale data will be used to identify linkages between pressure variables and BQE responses. Specific case studies, using a variety of modelling techniques, will address selected pressure response relationships and the efficacy of mitigation measures. The responses of different BQEs and different water categories to human-induced degradation and mitigation will be compared, with special focus on response signatures of BQEs within and among water categories. Guidance for the next steps of the intercalibration exercise will be given by comparing different intercalibration approaches. Stakeholders will be included from the outset, by building small teams of stakeholders and project partners responsible for a group of deliverables, to ensure the applicability and swift implementation of results.
International Initiatives and UN Programmes			
GEO	http://www.earthobservations.org/geoss_wa_tar.shtml		GEO was launched in response to calls for action by the 2002 World Summit on Sustainable Development and by the G8 (Group of Eight) leading industrialized countries. These high-level meetings recognized that international collaboration is essential for exploiting the growing potential of Earth observations to support decision making in an increasingly complex and environmentally stressed world. GEO is a voluntary partnership of governments and international organizations. It provides a framework within which these partners can develop new projects and coordinate their strategies and investments. As of 2013, GEO's Members include 89 Governments and the European Commission. In addition, 67 intergovernmental, international, and regional organizations with a mandate in Earth observation or related issues have been recognized as Participating Organizations. GEO is constructing GEOSS on the basis of a 10-Year Implementation Plan for the period 2005 to 2015. The Plan defines a vision statement for GEOSS, its purpose and scope, expected benefits, and the nine "Societal Benefit Areas" of disasters, health, energy, climate, water, weather, ecosystems, agriculture and biodiversity.
GEOSS	http://www.earthobservations.org/geoss.shtml		The Group on Earth Observations is coordinating efforts to build a Global Earth Observation System of Systems, or GEOSS. The Global Earth Observation System of Systems will provide decision-support tools to a wide variety of users. As with the Internet, GEOSS will be a global and flexible network of content providers allowing decision makers to access an extraordinary range of information at their desk. This 'system of systems' will proactively link together existing and planned observing systems around the world and support the development of new systems where gaps currently exist. It will promote common technical standards so that data from the thousands of different

			instruments can be combined into coherent data sets. The 'GEOPortal' offers a single Internet access point for users seeking data, imagery and analytical software packages relevant to all parts of the globe. It connects users to existing data bases and portals and provides reliable, up-to-date and user friendly information – vital for the work of decision makers, planners and emergency managers. For users with limited or no access to the Internet, similar information is available via the 'GEONETCast' network of telecommunication satellites. The Global Earth Observation System of Systems is simultaneously addressing nine areas of critical importance to people and society. It aims to empower the international community to protect itself against natural and human-induced disasters, understand the environmental sources of health hazards, manage energy resources, respond to climate change and its impacts, safeguard water resources, improve weather forecasts, manage ecosystems, promote sustainable agriculture and conserve biodiversity. GEOSS coordinates a multitude of complex and interrelated issues simultaneously. This cross-cutting approach avoids unnecessary duplication, encourages synergies between systems and ensures substantial economic, societal and environmental benefits.
Copernicus **The European Earth Observation Programme**	http://www.copernicus.eu/	It represents the European contribution to GOOS.	**Copernicus, previously known as GMES (Global Monitoring for Environment and Security), is the European Programme for the establishment of a European capacity for Earth Observation.** Copernicus is a European system for monitoring the Earth. Copernicus consists of a complex set of systems which collect data from multiple sources: earth observation satellites and *in situ* sensors such as ground stations, airborne and sea-borne sensors. It processes these data and provides users with reliable and up-to-date information through a set of services related to environmental and security issues... The services address six thematic areas: land, marine, atmosphere, climate change, emergency management and security. They support a wide range of applications, including environment protection, management of urban areas, regional and local planning, agriculture, forestry, fisheries, health, transport, climate change, sustainable development, civil protection and tourism. The main users of Copernicus services are policymakers and public authorities who need the information to develop environmental legislation and policies or to take critical decisions in the event of an emergency, such as a natural disaster or a humanitarian crisis. Based on the Copernicus services, many other value-added services can be tailored to more specific public or commercial needs. This will create new business opportunities. In fact, several economic studies so far have demonstrated a huge potential for job creation, innovation and growth.

			The Copernicus programme is coordinated and managed by the European Commission. The development of the observation infrastructure is performed under the aegis of the European Space Agency for the space component and of the European Environment Agency and the Member States for the in situ component. The provision of Copernicus services is based on the processing of environmental data collected from two main sources: • A space component, which consists of several Earth observation satellites; • An *in situ* component, which consist of a multitude of sensors on the ground, at sea or in the air. The European Space Agency (ESA) is responsible for the space component and coordinates the delivery of data from upwards of 30 satellites. The European Environment Agency (EEA) is responsible for the development of the *in situ* component and coordinates the gathering of data coming from both European and non-European organisations.
IHE – UNESCO	http://www.unesco-ihe.org/		**Institute for Water Education** The mission of UNESCO-IHE is to contribute to the education and training of professionals, the knowledge base through research and to build the capacity of sector organizations, knowledge centers and other institutions active in the fields of water, the environment and infrastructure in developing countries and countries in transition. In support of its mission, the Institute has three main goals: • Develop innovation, provide new knowledge, and promote the uptake of technologies and policies that will address the issues of the global water agenda, in particular those related to the Millennium Development Goals (MDGs) and the post 2015 Sustainable Development Goals (SDGs); • Seek, evaluate and facilitate responses for the sustainable management of water, to meet the needs of all sectors of society, particularly the poor; • Strengthen and promote principles of good governance that drive institutional and management change to support the sustainable management of water.
GEF	http://www.thegef.org/gef/whatisgef		**The Global Environment Facility** (GEF) unites 183 countries in partnership with international institutions, civil society organizations (CSOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives. An independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. Since 1991, GEF has achieved a strong track record with developing countries and countries

			with economies in transition, providing $11.5 billion in grants and leveraging $57 billion in co-financing for over 3,215 projects in over 165 countries. Through its Small Grants Programme (SGP), the GEF has also made more than 16,030 small grants directly to civil society and community based organizations, totaling $653.2 million.
UNEP	http://www.unep.org/		United Nations Environment Programme UNEP, established in 1972, is the voice for the environment within the United Nations system. UNEP acts as a catalyst, advocate, educator and facilitator to promote the wise use and sustainable development of the global environment. UNEP work encompasses: • Assessing global, regional and national environmental conditions and trends • Developing international and national environmental instruments • Strengthening institutions for the wise management of the environment **Mission** "To provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations." **Mandate** "to be the leading global environmental authority that sets the global environmental agenda, that promotes the coherent implementation of the environmental dimensions of sustainable development within the United Nations system and that serves as an authoritative advocate for the global environment" Priorities: Climate Change, Disaster and conflicts, Ecosystem management, Environmental Governance, Harmful Substances, Resource Efficiency.
IUCN	http://www.iucn.org/about/		International Commission for Conservation of Nature The International Union for Conservation of Nature is the world's oldest and largest global environmental organization. **IUCN at a glance** • Founded in 1948 as the world's first global environmental organization • Today the largest professional global conservation network • A leading authority on the environment and sustainable development • More than 1,200 member organizations including 200+ government and 900+ non-government organizations • Almost 11,000 voluntary scientists and experts, grouped in six Commissions in some 160 countries • IUCN's work is supported by over 1,000 staff in 45 offices and hundreds of partners in

			public, NGO and private sectors around the world. The Union's headquarters are located in Gland, near Geneva, in Switzerland. • A neutral forum for governments, NGOs, scientists, business and local communities to find practical solutions to conservation and development challenges • Thousands of field projects and activities around the world • Governance by a Council elected by member organizations every four years at the IUCN World Conservation Congress • Funded by governments, bilateral and multilateral agencies, foundations, member organizations and corporations • Official Observer Status at the United Nations General Assembly
Vessels and Boats			
Wien		Austria	A privet Austrian ship that can support the research programs. Total length: 20,4 m Width: 3,8 m Draught: 1,2 m Engine: 2x 200 hp Max. speed (rel. to water surface): 22 km/h downstream.
Meßschiff IV		Austria	A privat Austrian fishing ship that can be used in research projects.
Istros research ship	http://www.geoecomar.ro/website/nave-cercetare-istros.html	Romania (Lower Danube Danube Delta The coastal zone of Romania)	"ISTROS" is the coastal and river research ship belonging to the Romanian National Research and Development Institute for Marine Geology and Geo-Ecology GEOECOMAR. General characteristics: Displacement – 147,8 t Length – 32 m Width – 6,80 m Engine: – 2 engines type Doosan 350 CP each 3 electricity generators; no need for electricity at docking sites Fuel consumption: 90 l/h Cruising speed: 18 km/h downstream and 10 km/h upstream Draft theoretical: 1,08 m (practically 1,40 m) Common navigation area so far: Danube (from Regensburg to Sulina), Danube Delta, the coastal area of Romania. Accommodation facility: 10 places (2 single cabins and 4 double cabins). There is one laboratory on-board: (chemistry lab); possibility to use dining room for laboratory work.

			Storage facilities – 1 storage room ca. 3 x 2 x 2.5 m; opening ca. 1.2 x 0.65 m; 1 storage room ca. 2 x 2 x 2 m; opening ca. 0.65 x 0. 65 m. Cooling capacities: freezer 200 l, fridge 180 l with freezer 20 l, fridge 180 l; availability of 15 kW additional cooling capacity; space for at least 6 fridges and 2 freezers for storage of samples. Sitting capacity in the dining room: minimum 18 persons. Possibility to provide power and fuel for other ships in case of emergency. Equipments for launching measuring devices: - A frame aft - 2 winches on the sides - 1 oceanographical winch to the aft Other available equipment: - Equipment for river and marine navigation: radar (Simrad CX44), GPS (Simrad CX33), transponder AIS, radiostation; - Rescue equipment; - The ship has a large bow bridge, useful as a working place; - Two motor boats with engine, capacity 4 researchers and driver; two drivers from the crew of Istros available at each sampling site; - Short range radio transmission devices (walkie talkie) for the two motorboats; Crew: - Permanent: 7 pers. - Scientific: 10 pers. - Maximum capacity of passengers: 12 pers.
Halmyris floating laboratory and pontoon	http://www.geoecomar.ro/website/en/nave-cercetare-halmyris.html	Romania (Danube Delta)	**Technical characteristics:** • Length: 32 m; • Breadth: 6,60 m; • Draught: 0,60 m; • Displacement: 90 t; **Laboratory:** • Geochemistry; • Biology; **Facilitys:** • Electrical power generator; • Air condition intalations; **Other facilitys:**

			• 14 cabins (single and doubles – for 20 people); • Conference room (30 – 40 persons) • Boats.
Carina research boat		Romania (Danube Danube Delta Romanian coastal area of the BS)	"Carina" is the coastal and river research boat belonging to the Romanian National Research and Development Institute for Marine Geology and Geo-Ecology GEOECOMAR. Carina is used for areas where the access of Istros or Mare Nigrun (marine research vessel of Romania) is restricted or impossible (e.g. water depth). Technical characteristics: 6m long Diesel Engine of 150 HP It can accommodate up to 6 people.
Argus – Danube research ship	http://www.icpdr.org/main/publications/million-euro-boat-expedition-test-danube-pollution http://www.ngo.ro/site_item_full.shtml?x=1896	Serbia	The Argus was the main laboratory ship during 2 ICPDR surveys. It has a cruising speed of 25 km/h (some 13 km/h upstream). Dimensions: 33.0 x 4.5 m, drought: 1.35 m, height: 5 m. Serbia reported in December 2012 that the Argus is in good condition and that it had recently been completely refurbished. The ship has new radar and the system of communication enabling automatic communication with port authorities. A sieving machine is also in good condition and the following sieves are available: 3 x 0.063 mm, 1 x 0.250 mm, 1 x 1 mm and 1 x 2 mm. Only one bottom part (bellow all the sieves) is available. The following additional equipment is available on-board: • Bacterial incubator HASH small, • Binocular Magnifier, • Microscope, • Automatic dozers 40 ml 2 pcs, and 25 ml 2 pcs. • Microbiological incubators (the status still to be checked). Available cooling capacities: 2 x 60 L refrigerators and one combined (20 L freezer and 60 L fridge). Possibility of additional cooling capacities is limited by the available electric power. The maximum number of persons who can be formally reported on the Argus is 12 plus the crew.
Local/Regional Projects And Initiatives			
Evaluation of the anthropogenic activities impact on		Romania	This project was a multidisciplinary approach, which aimed to evaluate the impact of human activities in Sireasa polder on surrounding natural areas of the Danube Delta Biosphere Reserve. The second part of the project was devoted to the influence of dam

natural areas bordering agricultural polder Sireasa (Danube Delta Biosphere Reserve)			construction Sulina - Sf. Gheorghe road on adjacent habitats.
UAS inovative survey and monitoring model for colonially breeding waterbird species from Danube Delta Biosphere Reserve	http://delta.aerocontrol.ro/Project_Proposal-UAS-BIRDD%20-%20Short%20Version.pdf	Romania	UAS-BIRDD project envisage a strong interdisciplinary approach in order to identify, evaluate, design, experimentally test and determine all necessary aspects, to define, establish and demonstrate a full cycle functional model and dynamic information support system/toolset for wildlife management and environment research. Unmanned aircraft systems (UAS) are enabled by transformative high technology that can perform feature rich and cost-effective applications for environment, such wildlife management, wildfire command and control, farming and land use management.
Auswirkungen des Klimawandels auf Vegetation und Fauna der Donauaue		Germany	The objective of this project is to assess the impact on plant- and animal habitats along the last free-flowing stretch of the German Danube caused by climate-induced changes of water levels. Scenarios are derived from ensemble projections of runoff data. An extensive database, developed during the Environmental Impact Assessment for the planned river regulation in this stretch, is used. It contains information on flora, fauna and local environmental variables (hydrology, soil). Based on these data, statistic and rule-based models of plant species and plant communities as well as selected animal species (fishes and macro-invertebrates) are developed. Future water levels serve as input variables for these models aiming at the spatially explicit assessment of changes in the habitat. The project results will be used to support the Federal Waterways and Shipping Authority (WSV) in its strategic planning to counteract the effects of climatechange.
Improvement Of The Navigational Systems And Topohydrographic Measurements Along The Danube River		Bulgaria Romania	The project aims at improvement of the navigational systems being an important element for ensuring of safety inland waterway navigation. Specific objectives: modernization of the monitoring networks and methods for collection, processing and analyzing of data for quantitative assessment of the Danube waters in accordance with the requirements set by WMO, WFD and ICPDR; achieving the international standards for implementation of topographic measurements, including hydrographical and hydrological activities necessary for studying the changes along the inland waterways; improvement and unification of the marking quality of the fairway along the common Bulgarian-Romanian section of the Danube River; decreasing of the time for delivery of information to the users as one of the services related to the fairway conditions and the waters of the river; rehabilitation and improvement of the basic infrastructure being control geodetic network along the Bulgarian section of the Danube River.

			The project includes 3 components: 1) Establishment of a control GPS geodetic network on the Bulgarian bank of Danube River and its connection with EUREF 2) Modernization of the navigational systems in the Bulgarian section of the Danube River through delivery of floating and coastal signs 3) Delivery of equipment (surveying vessel, automatic hydrometric stations)
LIFE Szigetköz Project (LIFE04ENV/H/000382): Implementation of an innovative Decision Support Tool for the Sustainable water and land-use management planning and Flow Supplementation of the Hungarian-Slovakian Transboundary Danube Wetland Area	http://www.szigetkoz.info/beadott_riportok/07LaymanReport_LIFE04ENVH000382.pdf	Hungary Slovakia	The overall aim of the LIFE-III Szigetköz Project was to develop an innovative Decision Support Tool (DST) for the sustainable Water and Land-use Management Planning and Flow Supplementation of the Hungarian-Slovakian Transboundary Danube Wetland Area. The brand new DST is based on an integrated approach of studies and analyses evaluated by an innovative, on-line GIS-tool. The Decision Support Tool complemented by the other main result of the project, the flow-supplementation, helped the whole region to create the necessary planning for sustainable development according to the requirements of the Water Framework Directive and the subsidiarity. The objectives of the project were the following: » Creation of a GIS-based integrated Decision Support Tool (DST), which is able to handle social, environmental and also economic issues at the same time. The DST is a strategic development plan and decision-making protocol, based on the findings of the tasks of the "monitoring level". The long-term sustainability and efficiency is guaranteed by the newly-funded Szigetköz Development Council. » Implementation of an innovative, modern flow-supplementation in the Lower-Szigetköz area, and to demonstrate and test the applied technologies according to the requirements of the project and of the Water Framework Directive » Contribution to implementation the following EC Directives and principles in the region: Water Framework Directive, Transboundary Water Convention, RAMSAR Convention Subsidiarithttp://www.azo.hr/IPA2009CapacityBuildingFor y, Sustainable Development and many more.
Capacity Building for implementation Directive on pollution caused by certain dangerous substances discharged into the aquatic environment and the		Croatia	• Duration: 12 month (06/2012 - 06/2013) 1. Assessment of the current situation regarding the implementation of the requirements and provisions of the Water Framework Directive (2000/60/EC) and the Directive on pollution caused by certain dangerous substances discharged into the aquatic environment (2006/11/EC) and made recommendations for future implementation process. Recommendations must include proposals for an institutional setting, capacity building activities in the laboratory of Hrvatske vode and participation of all stakeholders. 2. Prepared guidelines on quality control methods for the determination of priority substances.

Water Framework			The guidelines must include procedures for testing validation and calibration method (unreliability of measurement). 3. Established methodology for assuring quality and quantity data control 4. Improved skills, knowledge and abilities of the Hrvatske vode laboratory staff on new analytical methods. 5. Enhanced capacity of all relevant stakeholders for the implementation of the Water Framework Directive and Directive on Pollution Caused by Certain Dangerous Substances Discharged into the Aquatic Environment 6. Prepare a report on the implementation of the monitoring of surface and groundwater in Croatia.
National Park Donau-Auen, Austria	http://www.donauauen.at/?language=english	Austria	The Donau-Auen National Park protects the largest contiguous wetlands environment in Central Europe. In this region – situated between Vienna and Bratislava – the freeflowing stretches of the Danube have been preserved. The wetlands along the river are the most pristine and ecologically significant of the Central European Danube. The diverse habitats of these wetlands – despite the Donau-Auen National Park's relatively modest total area of 9,300 hectares at present – make the biodiversity found here absolutely unique in all of Central Europe. Over 800 vascular plant species and more than 30 mammalian, 100 breeding bird, eight reptilian and 13 amphibian species – not to mention around 60 fish species – live on the National Park grounds. If one takes the abundance of terrestrial and aquatic insects as well as invertebrates into account, the number of individual species rises to over 5,000 Riverine Wetlands National Park, Category II, recognized by the IUCN. Total area currently over 9,300 hectares; of these, approx. 65% is riparian forest, 15% meadow, and approx. 20% is covered by water. Expansion of area is planned. The administration of the Donau-Auen National Parks is incumbent on the "Nationalpark Donau-Auen GmbH", a non-profit organisation formed by the Austrian federation and the provinces of Vienna and Lower Austria. Its managing director is the National Park Director, who sits in the regular general assemblies with the organisation's representatives from the federation and the provinces. Staff employed by the organisation is responsible for a variety of tasks in three main areas: organisation; visitors and region; and science and nature.
HESTIA – Harmonisation and Evaluation of Sampling Techniques	http://www.umweltbundesamt.at/en/services/services_resources/servi	Austria Slovakia	To secure our water resources for future generations, the EU adopted the water framework directive (WFD) in December 2000. In the implementation process of the WFD, all member states are required to perform trend monitoring on several pollutants in surface water, starting in 2010. Such a trend monitoring can be carried out in water,

in the Aquatic Environment	ces_water/?id=15552		suspended particles and sediments as well as in biota. The decision which matrix to survey is even more difficult for less water-soluble pollutants like polycyclic aromatic hydrocarbons (PAH) and heavy metals. For those there is no generally accepted method established within the EU. The objective of our project HESTIA was therefore to compare different monitoring methods for those pollutants (PAH, selected heavy metals) to give a technical recommendation on how to perform a trend monitoring in the aquatic environment.
MoRe - The Morava River Restoration	http://www.etc-more.eu/ms/etc_more/more_en/en_theproject/	Austria Slovakia	The project area extends from the confluence of the Morava and Thaya river km 69.00 to the village Sierndorf at river km 53.0. The revitalization of this section is based on a joint Austrian-Slovak Action Plan, which was for the entire cross-border route of the Morava River within the project bgmII created. The main objectives are to restore the original character of the meandering lowland river, to achieve a dynamic equilibrium according to the ecosystem approach and to improve the diversity of natural habitats in the floodplains. These aims are achieved through the gradual restoration of the natural interaction between the river bed and flood plain that are currently isolated from each other. The project objectives are in line with the requirements of the EU Water Framework Directive (achievement of good ecological status) to promote as well the favourable conservation status under the EU-Fauna-Flora-Habitat Directive and support the objectives of the trilateral Ramsar-site "March-Thaya-Auen".
OrientGATE - a structured network for integration of climate knowledge into policy and planning	http://www.orientgateproject.org/index.php?page=partnership	Austria Bulgaria Croatia Hungary Romania Serbia Ukraine	The OrientGate project aims to coordinate climate change adaptation efforts in SEE countries by building a lasting partnership between communities that produce knowledge and experimental studies, and communities that apply that knowledge. The project will: • develop a comprehensive and consistent methodology for assessing the risks arising as a result of climate variability and change; • harmonise risk assessment and communication on the part of hydrometeorological services; • encourage the use of acquired climate adaptation knowledge and experience in territorial planning and development; and • enhance capacity to reconcile the risks and opportunities inherent in environmental changes, including rising temperatures. The core output to be developed by OrientGate is a set of web tools, designed to provide access to data and metadata from climate observations and simulations that will be available through a data platform connected to the European Climate Adaptation Platform (CLIMATE-ADAPT). Other project outputs will include six pilot studies of specific climate adaptation exercises developed by the project's three thematic centres; capacity-building seminars and workshops;

			and a working partnership among the hydrometeorological services of SEE countries. The web-based network will make all project data, documentation, discussions and guidelines accessible not only to the project partners but also to all interested SEE territories not directly involved in the project.
Development of flood hazard maps and flood risk maps		Croatia	The purpose of this project is to implement requirements of the EU Floods Directive and to that end to prepare flood hazard maps and flood risk maps in the Republic of Croatia. This twinning project will focus on the second phase of the Floods Directive and will help in the preparation of flood hazard maps and flood risk maps for selected pilot areas as well as on preparation of guidance documents and capacity building of relevant institutions. The results of this twinning project will be of great help to Croatian experts for the upcoming third phase of the Floods Directive – the preparation of flood risk management plans. This Twinning is between Croatia and three EU Member States, the Netherlands, Austria and France.
Water shortage hazard and adaptive water management strategies in the Hungarian-Serbian cross-border region	http://wahastrat.vizugy.hu/	Hungary Serbia	Hungary, as a member of the EU is engaged to fulfil the requirements of the EU Water Framework Directive. Serbia, being a state heading towards the EU has also a great interest to meet the requirements of the document. To achieve the goals of the directive, catchment management plans need to be implemented, which provide a framework for major water related issues. However, the management of future extremities and hydro-climatic hazards, along with their more and more severe consequences, require an even more integrated approach. Conflicts related to water shortage must be treated in a complex way by resolving the opposing interests of different stakeholders (environmental protection, irrigation, industrial use). The project therefore aims to find integrated water management solutions for the increasing problem of water shortage. Catchments and water related problems are not related to administrative boundaries, thus any measures in this field require a strong cross-border co-operation.
Sustainable Transport and Tourism along the Danube	http://www.danubecc.org/upl/TRANSDANUBE_leaflet_EN.pdf	Austria Bulgaria Germany Hungary Romania Serbia Slovakia	The Danube is passing 10 countries on its way to the Black Sea. Therefore it is one of the most transnational rivers in the world. It is a river full of history and an important interlink between the regions of South East Europe. Several initiatives clearly identified the need for cooperation to boost the development of the Danube region. With the endorsement of the EU Strategy for the Danube Region in April 2011, the member states declared their will for common action. In line with the objectives of the South East Europe (SEE) Program, Transdanube is aiming at tackeling the weak accessibility levels and poor quality of transport services in SEE as a major constraint for further economic development and growth in the region. It is the objective of the

			project to develop Sustainable Mobility along the Danube including environmentally friendly modes of transport in order to improve the accessibility and facilitate the concept of sustainable tourism in the whole Danube region. The regions will benefit from increased added value from tourists being able to reach touristic destinations even in the hinterland of the river. The development of sustainable transport offers will stimulate the shift to environmentally friendly mobility systems resulting in reduced green house gas emissions/pollutants/noise and better transport services for the inhabitants as well. This will finally influence the quality of the whole region for economic development and the quality of life for the inhabitants themselves. In order to reach the set objectives, Transdanube is following an intersectoral approach combining the transport and the tourism sector, where the level of cooperation is still weak at the moment. Based on an analysis of the state of the art of sustainable transport offers and tourism the partners will develop actions plans resulting in a priorisation of possible solutions necessary to overcome the identified gaps. A commonly defined vision for Soft Mobility developed and agreed by the project partners will be the guideline for the development of sustainable transport offers. Depending on the project partners? current stage in the planning process, activities will include the elaboration of feasibility studies, pre-investment studies and demonstrations for the implementation of new/ improved multimodal transport offers, new shipping services and new/improved bicycle routes/services. As information about different available mobility options is crucial for the usage of existing and/or newly developed transport offers, access to this information has to be provided on different levels. The involvement of regional/ national and transnational stakeholders is of major importance for the success of the project. Workshops on the regional/national level as well as the participation in transnational conferences and project meetings will provide adequate forums to inform relevant stakeholders about the project and to get access to their know-how during the development and implementation of specific sustainable mobility solutions. The main outputs and results will be: Transnational State of the Art Report on sustainable mobility in the Danube region; Commonly developed vision of Soft Mobility; regional action plans; precise sustainable transport offers; digital maps presenting information about existing mobility- and tourism offers; Soft Mobility packages and marketing plans. With 14 financing partners allocated equally along the Danube and a large board on strategic partner observers from all levels, the project outputs will reflect the situation of sustainalbe mobility and tourism in this whole area. Summing up the expriences gained during action implementation in reports and manuals will proof and facilitate the reproducible character of the developed solutions. Therefore, Transdanube will support the promotion of sustainalbe mobility as an environmentally friendly possibility to improve the accessibility in

			the SEE region. During the two years of the project's implementation the following activities will be carried out: • Transnational state-of-the-art report on sustainable mobility in the Danube region (including good practice collection) • Common soft mobility vision • Regional action plans • Sustainable transport offers => Soft mobility tourism packages • Digital map, presenting information about existing mobility and tourist offers • Regional marketing plans and specific marketing activities
Sustainable spatial development of Danube area in Serbia		Serbia	The subject of the Project is the formation of a conceptual basis for an integral and balanced spatial development of Danube area in Serbia. The key determinants of the development in the EU Danubian countries are aimed at an integrated development of regions and local communities in the coastal zone. The impact of the international development documents on the Danube Area will be especially analyzed, as Serbia's priority within the transport, economic, cultural and other forms of integration into the EU. The potential, limitations and manners of solving conflicts in the spatial development of the Danube Area will be examined and analyzed, from the aspect of the impact of transport corridor VII, water supply, tourism, mining, energy supply, industry etc, on the sustainable exploitation of natural and cultural areas. Realizing the methods and determining the instruments for overcoming high concentration of population and economy and development conflicts is one of the greatest priorities of this Project, especially from the aspect of directing rural development and rational use of space in settlements, the protection of natural areas and cultural heritage. Activating the potentials of Danube Area in Serbia is conditioned by the affirmation of strategic planning and the development of a system of indicators (GIS) for efficient management of sustainable development and integral environmental protection.
SEERISK - Joint Disaster Management risk assessment and preparedness in the Danube macroregion	http://www.seeriskproject.eu/seerisk/#main	Austria Bulgaria Hungary Romania Serbia Slovakia	As a general trend in the SEE region, the frequency and seriousness of extreme climatic events is increasing due to climate change. Even though climate change affects countries, territories and localities differently, there are common and typical challenges. SEERISK takes into account specific risks and horizontal challenges as well. The countries involved are territorially coherent: the project concentrates on the Middle and Lower Danube Basin, where a wide range of risk types occur. There are localities where flashflood is the predominant risk factor (e.g. in Srbac), whereas in other project territories, unforeseeable thunderstorms cause serious damages (e.g. to tourism in Siófok) or frequent draughts cause damage to agriculture. Low level of

			awareness (addressed via risk assessment), week preparedness (to be addressed through better information flow, awareness raising, cooperation) and institutional gaps (to be addressed by institutional analysis) and weak territorial planning are common, horizontal challenges in those regions. Objectives of the project • to formulate common methodology for the assessment of natural hazards, • reveal the similarities and distinctions between the institutional framework of risk assessment and disaster management • put in local practice the European Commission risk assessment guidelines • reveal the gap between risk experts and communities' understanding of climate change • close gap between risk exposure and preparedness.
SEE RIVER - Sustainable Integrated Management of International River Corridors in SEE Countries	http://www.see-river.net/results.html	Austria Croatia Hungary Romania Serbia Slovakia	Rivers in SEE region are often threatened by unsustainable use, increasing human pressure, and problems of increased floods and droughts driven by climate change. Inhabitation of floodplain areas, hydropower utilization, navigation, gravel and sand extraction, unsustainable tourism etc. lead to changes in morphology, increased pollution, degradation of aquatic habitats, as well as land use conflicts. The most pressures in a river basin occur along river corridors, challenging the sustainable water and riparian land use. The common EU legislation, in particular the Water Framework Directive, the Flood Directive, the Habitat Directive, the Birds Directive and the Renewable Resources Directive, gives a framework to develop processes and practices for sustainable river management. However, such sectoral objectives are often antagonistic and provide a challenge for river managing authorities when it comes to the implementation phase. The main objective of the SEE RIVER project is to empower the multi-sectoral stakeholders sharing the territory of an international river corridor to gain knowledge on planning and implementing processes for integration of existing sectoral policies, plans and programmes in order to reach consensus on integrative management of international river corridors, taking into account both the development and the conservation interests. This will be achieved by developing the SEE RIVER Toolkit - a joint approach for establishing common frameworks for integrative management of international river corridors in SEE. Such framework will be established for the Drava River and initiated on 5 other SEE rivers: Bodrog, Prut, Soca, Neretva and Vjosa rivers. The River Frameworks will use a cross-sectoral participatory approach to reach consensus among international stakeholders on the joint vision, goals and measures for sustainable management of river corridors. The project added value is that it does not aim at preparing new sectoral management plans, nor invent new costly managing structures to improve the management of river corridors. It rather provides a framework for utilising the existing management structures and

			sectoral policies, plans and programmes. The project aim is to simplify and rationalise the procedures for reaching synergetic solutions between development and conservation interests of stakeholders along international river corridors. Through application of the Toolkit and the Frameworks on 6 SEE Rivers the project will improve the transboundary and multi-sectoral cooperation of existing bodies responsible for the management of river corridors in 14 SEE countries. This will increase the capacities and skills for consensus building among policy making and implementing bodies from different sectors in SEE. This way the project will improve policy making processes which we believe is the only way to long term improvement of the quality of life along the river corridors and in the wider SEE region.
SEEMAriner -South Eastern Europe Marine and River Integrated System for Monitoring the Transportation of Dangerous Goods	www.seemariner.eu/ http://www.delmne.ec.europa.eu/code/navigate.php?Id=2221&project_id=180	Austria Bulgaria Croatia Rep. of Moldavia Romania Serbia Slovakia Ukraine	The SEE area is a sea and river transit space of vessels carrying hazardous freight which constitutes many potential environmental risks for coasts and inland waterways. Economic development and a strong growth of transport and increased traffic in the SEE area aggravate the already increased threats of pollution and thus there is a great need for efficient management and for high performance observation, communication and monitoring response systems. Results: • Improved coordination, harmonisation and availability of data on the transportation of dangerous cargoes; • Enhanced managerial skills and equipment for handling dangerous cargoes; • Developed and tested common management structures and tools for the monitoring of dangerous goods transportation; • Streamlined procedures and protocols for emergency situations or disasters caused by the transportation of dangerous goods.
SEE HYDROPOWER - targeted to improve water resource management for a growing renewable energy production	http://www.seehydropower.eu/	Austria Rep. of Moldova Romania	Hydropower is the most important renewable resource for energy production in the SEE countries but creates ecological impacts on a local scale. If on one hand, hydroelectric production has to be maintained and likely increased following the demand trend and RES-e Directive, on the other hand, hydropower utilisation often involves severe hydrological changes, damages the connectivity of water bodies and injures river ecosystems. The project gives a strong contribution to the integration between the Water Frame and the RES-e Directives in the involved countries.
Sava river basin: sustainable use, management and protection of resources	http://wbc-inco.net/object/project/8016	Croatia Serbia	The Sava River (945 km) is the biggest tributary to the Danube River and has 95551 km2 large catchment. It extends over four countries, Slovenia, Croatia, Bosnia and Herzegovina and Serbia and Montenegro. In the development of the river basin management plan all countries are already collaborating under the International Commission for the Protection of the Danube River (ICPDR) guidance. Until 1991, the methodological bases for data collection have been

			reasonably unified over the catchment, but lucking a lot of today's important aspects such are ecological character of the river and its tributaries, inventory of pollution sources, dangerous substances, socio-economic parameters, cost and benefit implications and similar. For the later period a lot of data a re missing due to insufficient monitoring (financing, recent warfare) and weak institutional and legal control over use of water and land resources of the Sava River catchment. Many aspects of the river quality need scientific investigations. Furthermore, there is a need to link the knowledge of river quality state and environmental and health risk with pressures and their driving forces to propose efficient and beneficiary actions and measures for protection. In the project specific tools based on combined ion of chemical analysis and biological effect methods will be developed and validated for the pollution of sediments and impact on water biota. Geographical distribution of pollution will be identified and historical trends defined. Integrated prediction model about the behaviour of hazardous chemical substances will be integrated with the socio-economic prediction model to serve as a base for the elaboration of scenario, remediation measures and best practice techniques. For that purpose an expert data an d information management system will be developed. It ended in 2007.
Protecting Rivers from Accidental Industrial Pollution	http://territorialcooperation.eu/frontpage/show/360	Bulgaria Hungary	Although the general condition of most European rivers has improved over recent years, accidental spills of chemicals in rivers remain a severe threat to the environment. This risk is characteristic of all regions involved in the RIVER SHIELD project, as the areas are crossed by rivers which flow through more than one country, such as the Danube, Oder, Strimon and Nestos. To overcome the problem of accidental industrial pollution a close co-operation of all involved authorities, services and organisations from all countries concerned is necessary. River Shield targets the protection of rivers from pollution caused by industrial accidents through development and implementation of risk management, prevention and response good practices. The project partners are public authorities and environmental protection organisations from Greece, Hungary, Poland, the Czech Republic, Slovenia and Bulgaria. River Shield increases the capacity of the involved environmental protection and emergency response services to minimise the impact of potential industrial accidents. Regional Networks will be formed to strengthen know-how exchange and transnational co-operation. Emergency response guides will be compiled and disseminated. Spatial planning and land-use measures and policies will be developed and proposed. As a supportive mechanism, the River Shield Unit for the future utilisation of the project outcomes will be institutionalised. Dissemination actions will be carried out at regional, national and European level.
Risk mapping studies		Romania	The project’s partnership is the core of a research network whose activity aims to develop

and planning. Providing a digital terrain model for risk management in the Lower Danube (RISKGAL)			monitoring and analysis of risk factors in the Lower Danube, at a level of excellence according to international norms. The project covers three types of natural hazards (earthquakes, landslides and floods), only seismic hazard is unpredictable and unforeseeable. Hazard / natural risk maps should be defined in the county territory, by a multidisciplinary team specialized and properly equipped. The project aims to develop further risk maps based on the elaborated hazard maps, taking into account the vulnerability of the sites objectives. The natural hazard maps will give high precision results in four dimensions, with an indefinite possibility of use in time and space. The expert system developed from these maps will be on the hand of local authorities for optimal, efficient and scientifically based decisions.
Past Projects			
EUWater - Transnational integrated management of water resources in agriculture for the EUropean WATER emergency control	http://www.eu-water.eu/	Croatia Hungary Romania Serbia Ukraine	EU.WATER, carried out in 8 rural study areas belonging to 8 SEE Countries, tackles the emergency related to water consumption and contamination in Europe, and aims at spreading, at transnational level, integrated water resource management in agriculture based on the optimization of water consumption and cutback of groundwater pollution. Through a joint strategy and its downscaling within each Project Partner's governance framework, EU.WATER (which starts from the capitalization of the extreme & fragmented load of results of previous projects) moves towards (1) application of the EU Water and Nitrate Directives across SEE Countries (2) development of adaptive-learning practices and innovative solution to contribute at the transition of local agriculture towards innovative and environmental-friendly measures (3) incentives to farmers to adopt eco-prescriptive practices. EU.WATER, fostering the ongoing rural reforms and agricultural transformation process of most of the SEE Countries (some of them approaching the EU entry), has the capacity to positively influence the process for choosing agricultural management practices at the field scale, where the application of environmental protection measures bring to A) the stewardship of the natural resources B) the generation of incoming benefits in terms of crop's productivity. Ownership & capacity to achieve the expected results is ensured by the profile of PPs and by the role assigned to stakeholders: combination of governance actors (at national, regional and provincial scale) + high-professional technical institutions (as agro-environmental research centres & universities) + permanent network of technicians, association and farmers (called upon to contribute to the general strategy and to apply land-based practices) assure the reach of objectives and the effective impact of the project in the local rural policies. EU.WATER is scheduled to run from March 2009 to February 2012.
Water scenarios for Europe and for Neighbouring States	http://www.wise-rtd.info/en/info/water-scenarios-	Hungary Romania Ukraine	The SCENES project will develop and analyse a set of comprehensive scenarios of Europe's freshwater futures up to 2025, covering all of Greater Europe reaching to the Caucasus and Ural Mountains, and including the Mediterranean rim countries of north Africa and the near

(SCENES)	europe-and-neighbouring-states		East. These scenarios will provide a reference point for long term strategic planning of European water resource development, alert policymakers and stakeholders about emerging problems, and allow river basin managers to test regional and local water plans against uncertainties and surprises which are inherently imbedded in a longer term strategic planning process. Funding Programme: FP6
UNDP/GEF DRP - Danube Regional Project	http://aws.undp-drp.org/drp/project	Bulgaria Croatia Hungary Moldavia Romania Serbia Slovakia Ukraine	The main goal of the project is to strengthen existing structures and activities in order to facilitate a regional approach, thus strengthening the capacity of the ICPDR and the Danube countries to fulfill their legally binding commitment to implement the Danube Convention. This task now also includes the development of a River Basin Management Plan in line with the EU's Water Framework Directive. The following project components are designed to respond to the overall development objective: • Creation of sustainable ecological conditions for land use and water management; • Capacity building and reinforcement of transboundary cooperation for the improvement of water quality and environmental standards in the Danube River Basin; • Strengthening of public involvement in environmental decision making and reinforcement of community actions for pollution reduction and protection of ecosystems; • Reinforcement of monitoring, evaluation and information systems to control transboundary pollution, and to reduce nutrients and harmful substances. Duration: 2001-2007
Defensive strategies and cross border policies. Integration of the Lower Danube area in the Roman civilization	http://www.strateg.org.ro/index-en.html	Romania	The project aims at developing an integrated IT system for the collection, analysis, valorisation and elevation of the results of archaeological research in the Roman provinces covered by the Romanian territory. C OORDINATOR: National History Museum of Romania (MNIR) PARTNERS: • Bucharest University (UB) • "Vasile Pârvan" Archaeology Institute (IAB) • Archaeology and Art History Institute (IAIAC) • SC Digital Domain SRL (DD) The research supposes: • a) the field research phase - obtaining modern measurements (topographic, radar and GPS) of the objectives targeted by the project, as well as their photographs. • b) data processing, that means: 1) assembling a maps, epigraphic, photographic,

			bibliographic and topographic archive; 2) recording this archive on a digital format, accessible on line • c) the analysis of the data obtained and the presentation of the results in specialized works on a classic format and on line, in seminaries or optional courses at the Faculty of History (Bucharest). Obtaining a series of ample analyses that will be published in the Centre's monographic series.
Potential threats to environmental and economic sustainability in the Danube and Black Sea region: Danube River as invasive alien species corridor	http://www.esenias.org/index.php?option=com_content&view=article&id=302:news-10-danube-field-trip-&catid=52:esenias-news&Itemid=125	Bulgaria	The main goal of the project is to analyse the role of the invasive alien species (qualitative and quantitative parameters, impact, measures) for the sustainable development in the Danube and the Black Sea region. To implement this goal, regular monitoring will be carried out, lists of alien and invasive species, as well as pathways of their introduction, will be developed, data about biology, ecology and impact will be collected. The results will be used for risk assessment and development of risk management plan.
Tisza River Project (EVK1-CT-2001-00099); Real life scale catchment models for supporting water and environmental management decisions	http://www.wise-rtd.info/en/info/tisza-river-project-real-life-scale-integrated-catchment-models-supporting-water-and	Hungary Romania Ukraine	End date of the project: 31/12/2004 Funding program: FP5 Contract Code: EVK1-CT-2001-00099 The Tisza river basin is of major concern from both water- and environmental management points of view. This is also the international catchment where the catastrophic cyanide and heavy metal pollution accidents happened. The work in the Tisza-River project focussed on the development of a 'real-life-scale' catchments model for this river basin. In addition, eco-hydrological management strategies were developed for the unique wetlands of the riparian zone of the river. Objective oriented sets of hydrological, hydraulic, water quality and ecological models were developed to form an integrated model system that meets the users' requirements.
UNIVERSITIES, INSTITUTES AND LABORATORIES			

Universität für Bodenkultur *Wien* (*BOKU*)	http://www.boku.ac.at/en/	Austria	The University of Natural Resources and Life Sciences, the Alma Mater Viridis, perceives itself as a teaching and research centre for renewable resources, which are necessary for human life. Topics: Forestry and Wood Science, Water Management, Agriculture, Food Chemistry and Biotechnology, Natural Resources Management and Ecological Engineering, Landscape Design and Landscape Planning, Environment and Bio-Resources Management. The university offers BSc and PhD programmes and Master studies in English.
Centre for Global Change and Sustainability- University of Natural Resources and Life Sciences, BOKU	http://www.boku.ac.at/	Austria	The Centre for Global Change and Sustainability supports the University of Natural Resources and Life Sciences in realizing its societal responsibility; provides impetus for ideas regarding topics of global change and sustainable development. The Centre is a place of interdisciplinary, scientific debate and offers a learning environment for complex relationships and innovative ideas.
University of Vienna, Faculty of Earth Sciences, Geography and Astronomy; Faculty of Chemistry; Faculty of life sciences	http://www.univie.ac.at/en/university/	Austria	The University of Vienna was founded by Duke Rudolph IV in 1365. It is the oldest university in the German-speaking world and one of the largest in Central Europe. The University of Vienna is the largest Austrian research institution. Approximately 6,900 academics guarantee its outstanding performance in research and teaching. The 15 faculties and four centers are dedicated to both basic and applied research.
Research Centre of Hydraulic Engineering - Laboratory, TU Vienna, Austria	http://www.kw.tuwien.ac.at/en/research-center-of-hydraulic-engineering/laboratory/service-offer.html	Austria	The present Institute of Hydraulic Engineering and Water Resources Management was established as part of the then Vienna Polytechnic in the year 1818. Professor Schaffernak setup a first Laboratory in the main building in 1926. Since 1995 the Institute has had a new Hydraulic Laboratory at the Aspanggründe, Adolf-Blamauer Gasse 3, A-1030 Vienna. The Laboratory consists of a main testing hall, an attached testing hall with 2 tilting flumes, an office block and an open-air testing area with a canvas-protected zone. Both testing halls are connected with the workshop and storage rooms for materials for model production. Each location of the testing area can be independant supplied with water by means of stationary or flexible pipes (present installed pump capacity is 2500 l/s). Additionally to these laboratory facilities are a seminar room, several offices and auxiliary rooms in the attached block. The Laboratory has presently the following test facilities with the necessary infrastructure to fulfill the requirements in teaching, experimental research and commercial testing. •Testing halls with crane 1400 m² •Open-air testing area 2000 m² •2 tilting flumes each of length 17 m

			•Flexible flumes •Reservoir 1000 m³ •Capacity of pumps 2500 l/s •Mechanical workshop with crane 300 m² •Electronic laboratory 80 m² •Offices and seminar room 300 m² The performance of hydraulic model tests within internal but primarily external financed (from private and public clients) research projects (fundamental and applied research as well) are counted adjacent to teaching to the main activities of the Institute. These projects concern mainly the following research fields: • River engineering (flood protection, sediment transport, navigation) • Ecological hydraulic engineering (restoration, bed stabilization, fish migration facilities) • Hydraulic Structures (weirs, power stations, dams, spillways, intakes, outlets, power conduits, gates, diversions, specific structures) • Duct systems (valves, manifolds, culverts etc.) • Cooling water systems (pumping stations) etc. • Embankment dams (slope protection - overtopping sections, dam-break flood analysis - breach formation, design - constructive solutions
Christian Doppler Laboratory - Advanced methods in river monitoring, modelling and engineering, Vienna, Austria	https://forschung.boku.ac.at/fis/suchen.projekt_uebersicht?sprache_in=en&menue_id_in=300&id_in=8191	Austria	Water forms the basis for life, on the other hand destroys life during extreme floods. Rivers are the lifelines of the landscape, most human settlements are situated along these since thousands of years, related to all possibilities of usage – including navigation, hydropower and recreation - but also danger. These anthropogenic uses of rivers impact the ecological status, so that conflicts increase between economic use and ecological functionality. The interrelation between transport of water, sediments, morphodynamics of rivers, ecology and the consequences of river engineering measures are not fully understood and described. The Christian Doppler Laboratory for Advanced methods in river monitoring, modelling and engineering aims to improve the understanding of processes in rivers, to design mathematical models for simulating river processes and to predict the consequences of engineering measures as well as to develop river engineering methods for improving navigation, ecology and flood protection. Laboratory Module I - River Monitoring New monitoring methods such as Acoustic Doppler Velocimetry, Radiotracer, Multibeam Echosounder and shear stress plates will be combined, further developed and applied, in order

			to improve the understanding of river processes, the calibration and validation of mathematical models and monitoring programs and the optimisation for practical usage by UWITEC and via Donau. Module II - River Modelling Multidimensional mathematical models will be planned and designed for simulating hydrodynamics, sediment transport, river morphodynamics as well as ecological processes through habitat modelling for later use in river engineering projects by via Donau. Thereby data from Module 1 form the basis for model calibration and validation and the results enter Module III. Module III - River Engineering and Management The development and implementation of advanced river engineering measures are based on monitoring (Module I) and modelling (Module II) results and rely on an improved process understanding. By the realization of the optimized measures via Donau will be contributing significantly to the economic development along the Danube river as international waterway as well as to the improvement of the ecological status.
Federal Environment Agency Austria(Umweltbundesamt) Ecosystem Monitoring	http://www.umweltbundesamt.at/	Austria	Within the scope of environmental control, the Umweltbundesamt records, analyses and evaluates data on the state and development of the environment in all areas. The main task of Umweltbundesamt is primarily to support the environmental policy of the federal government. The Umweltbundesamt is a sought-after partner of international organisations such as the EU Commission, the European Environment Agency, UNEP, OECD and ECE. Cooperation activities are aiming at the development of integrated and harmonised networks of multi-functional long-term ecosystem research platforms to support interdisciplinary investigation of long term processes related to the different components of biodiversity at relevant spatial and temporal scales in Europe.
University of Sofia, Faculty of Geology and Geography; Faculty of Chemistry and Pharmacy; Faculty of Biology	https://www.uni-sofia.bg/index.php/eng/the_university/faculties	Bulgaria	Sofia University St. Kliment Ohridski is the first institution of higher education in Bulgaria. The teaching staff includes a significant part of the best specialists in Bulgaria in all major areas of sciences and humanities. Research is an integral part of the teaching process. It is fully supported yet not conducted by the Rector's administration. Research is a prerequisite for keeping pace with the most recent developments in the respective areas for both the lecturers and university structures – laboratories, faculties, etc.
The Institute of Biodiversity and Ecosystem Research (IBER)	http://www.iber.bas.bg/	Bulgaria	IBER is focused on theoretical and applied aspects of ecology, biodiversity, environmental conservation and sustainable use of biological resources studies and providing training in the competencies fields.
Institute of	http://www.io-	Bulgaria	The research activities of the Institute are in the field of marine physics, chemistry, geology

Oceanology 'Fridtjov Nansen', Bulgarian Academy of Science (IO – BAS)	bas.bg/index_en.html		and archaeology, biology and ecology, coastal dynamics and ocean technologies. It carries out complex monitoring of the Bulgarian part of the Black Sea, develops consulting and expert activities, and prepares qualified marine scientists. IO represents BAS as a co-ordinator of all studies related with the Black Sea and World Ocean by the National Oceanographic Commission (NOC) and successfully directs the research activity and international relations within the frame of the Intergovernmental Oceanographic Commission of UNESCO.
Geological Institute 'Strashimir Dimitrov', Bulgarian Academy of Science, (GI-BAS)	http://www.geology.bas.bg/res.html	Bulgaria	The Geological Institute is the largest and most complex Bulgarian research organization in geology. The research activities include fundamental and applied problems in the main branches of the geological knowledge: paleontology, stratigraphy, sedimentology, geotectonics, regional geology, petrology, geochemistry, mineralogy, mineral deposits, hydrogeology, engineering geology and geoecology. All projects under development are in close relation to the national priority of the Bulgarian society and the requirements of the sustainable development.
University of Zagreb - Faculty of Chemical Engineering and Technology	http://www.fkit.unizg.hr/en	Croatia	Faculty of Chemical Engineering and Technology is organized in several Departments and Chairs that perform teaching (undergraduate & graduate courses, postgraduate scientific &postgraduate specialization), scientific work, professional and consulting activities in Chemical Engineering, Chemistry and other fields.
Rudjer Boskovic Institute	http://www.irb.hr	Croatia	Rudjer Boskovic Institute (RBI) is the largest Croatian research centre for basic sciences, participating also in science applications and higher education. The Institute has multidisciplinary character activating in various research fields: physics, chemistry, oceanography (including marine and environmental research and geosciences), biology, biomedicine, computer science and electronics/engineering. RBI infrastructure includes twelve divisions, three centres, the largest library in natural sciences in Croatia, computing centre, animal facilities and large number of valuable experimental devices (Xcalibur Nova R – Diffractometer System, RIGAKU D/MAX Ultima IV Theta-Theta X-ray Diffractometer System, Typhoon 9200 Phosphoimager, Atomic Force Microscope (AFM), Scanning Electron Microscope (SEM), Tandem Van de Graaff Accelerator, Fourier Transform Electron Paramagnetic Resonance (FT-EPR), Nuclear Magnetic Resonance (NMR), HPLC/MS/MS, IR, Raman spectrometers).
Fraunhofer-Gesellschaft Institutes	http://www.fraunhofer.de/en.html	Germany	Fraunhofer is Europe's largest application-oriented research organization. Our research efforts are geared entirely to people's needs: health, security, communication, energy and the environment. As a result, the work undertaken by our researchers and developers has a significant impact on people's lives. We are creative. We shape technology. We design products. We improve methods and techniques. We open up new vistas. In short, we forge the future.

			The Mission Statement reflects the chief outline of our activities. It defines how we perceive the fundamental purpose of our work and our responsibilities toward our staff and society. From this statement, we have derived a four-part definition of our Values and Principal Objectives. Together, they form the Guiding Principles of the Fraunhofer-Gesellschaft. • The Fraunhofer-Gesellschaft promotes and conducts applied research in an international context to benefit private and public enterprise and is an asset to society as a whole. • By developing technological innovations and novel systems solutions for their customers, the Fraunhofer Institutes help to reinforce the competitive strength of the economy in their region, throughout Germany and in Europe. Their research activities are aimed at promoting the economic development of our industrial society, with particular regard for social welfare and environmental compatibility.
Max Planck Institute for Biogeochemistry	http://www.mpg.de/institutes	Germany	Research Institute; Max Planck Society The institute studies of the complex interaction between the organisms in the soil and the greenhouse gases in the atmosphere, as well as the influence of humans on these natural processes. Study of the ecosystems inter-action to various climate conditions, land-use practice and species diversity by comparing historical data with current observations from field experiments and measurement campaigns in order to draw conclusions on the future adaptability of organisms.
Max Planck Institute for Chemical Ecology	http://www.mpg.de/institutes	Germany	Investigation of the role, diversity and characteristics of chemical signals which control the interactions between organisms and their environment in order to understand the complex system of chemical communication.
Max Planck Institute for Marine Microbiology	http://www.mpg.de/institutes	Germany	There are currently 82 Max Planck Institutes and research facilities in the Max Plank network, this RI being state of the art on the field of microbiology focused on bacteria studies.
Cleaner Production Germany	http://www.cleaner-production.de/	Germany	Cleaner Production Germany is a website published by the Federal Environment Agency (UBA), and includes 2,500 state-sponsored project descriptions and publications. Cleaner Production means improving processes in such a way that the resources used are transformed into products as efficiently as possible, eliminating where possible waste and emissions at source. This reduces the cost of raw materials, energy and waste disposal, at the same time lowering the risk of environmental pollution and improving safety at work.
Max Planck Institute for Terrestrial Microbiology	http://www.mpg.de/institutes	Germany	Main objectives: • Study of the metabolic diversity of microorganisms. • Analysis of the mechanisms that enable microorganisms to adapt to changing environmental influences and to modify themselves accordingly.

			• Investigation of the organisms cellular regulation and reproduction regulation. • Study the biogeochemical processes responsible for the exchange of climatically-relevant trace gases. These analyses encompass all functional levels, from the atomic and structural level to the molecular and cellular level, through to biochemistry and physiology, microbial communities and the association of microorganisms with plants.
German Climate Computing Centre (DKRZ)	https://www.dkrz.de/dkrz-en	Germany	German Climate Computing Centre (DKRZ) provides services for climate researchers. Its mission is to install and operate a high-performance computer system for basic and applied research in climatology as well as related disciplines.
Humboldt-Universität zu Berlin, Museum fur Naturkunde	http://www.naturkundemuseum-berlin.de/	Germany	The Berlin Museum of Natural History hosts over 30 million objects and it houses one of the most important natural history collections in the world. The scientific collections include mineralogical, geological, paleontological and zoological specimens. They are the raw material for the research carried. Research collections are ranked among the most important world-wide and offer excellent access to taxonomic primary information. FACILITIES AND SERVICES FOR RESEARCHERS The Berlin Museum of Natural History is offering science modern equipped research facilities: DNA-Sequencer, 3-D reconstruction technologies, facilities, facilities for microscopic anatomy, embryology, and histology, scanning electron microscope with kryo-transfer equipment, analytical transmission electron microscope, electron microprobe, Raman microscope spectrometer, X-ray diffraction instruments.
Eotvos Lorand University, Faculty of Science	http://science.elte.hu/	Hungary	The Faculty of Science is organized in several institutes and departments: Institute of Biology, Institute of Chemistry, Institute of Geography and Earth Sciences, other departments, etc. The faculty offers BSc, Master and PhD programmes, in the mentioned subjects.
University of Szeged	http://www.u-szeged.hu/	Hungary	The University of Szeged offers a wide range of educational programs, such as Bachelor's, Master's, PhD (doctoral), as well as postgraduate specialist training programs. The University of Szeged is actively involved in drawing up middle and long-term programmes (e.g. Biopolisz Pólus) shaping the development of Szeged and the Dél-Alföld region. A variety of R & D activities are conducted by the researchers of the University of Szeged, significant for Danubius being: information technology and software engineering, nanotechnology and materials science, environmental technology and genetics.

Institute of Ecology and Botany of the Hungarian Academy of Sciences	http://mta.hu/articles/institute-of-ecology-and-botany-of-the-hungarian-academy-of-sciences-126326	Hungary	Basic and applied research in the field of ecology, botany and hydrobiology. Research is carried out in the following topics: • Organisation and dynamics of biocoenoses; • Biodiversity patterns at various scales; • Hydrobiology of running and standing waters and wetlands; • Ecological effects of climate- and land use changes; • Conservation biology and restoration ecology; • Exploring and utilising new plant resources; • Investigation and analysis of natural vegetation in Hungary; • As a special task, the maintenance and development of the collections of the Botanical Garden.
Balaton Limnological Institute, Hungarian Academy of Sciences	http://www.bli.okologia.mta.hu/en	Hungary	Research groups: • Bioacustics and Biomanipulation • Chemical Ecology and Neurobiology • Environmental Toxicology • Benthos • Nutrient Cycling • Phytoplankton and Macrophyte • Zooplankton and Periphyton
Centre for Ecological Research, Hungarian Academy of Science	http://www.okologia.mta.hu/en/node/2	Hungary	The mission at the Centre is to carry out high quality research on the biological diversity of forest, grassland, lake and river ecosystems, to learn about these systems, and to provide evidence of the importance of their conservation. The Centre is the home of researchers from various disciplines, including ecology, botany, hydrobiology, meteorology, agronomy, forestry, as well as interdisciplinary sciences.
Danube Research Institute, Hungarian Academy of Sciences	http://www.dki.okologia.mta.hu/en	Hungary	The **main research topics** of our centre are: • the study of the composition, structure, dynamics and functioning of terrestrial and water ecosystems; • the study of the sustainability of ecosystem services from an ecological view; • research correlating to the international operative agreements regarding the protection of habitats, biodiversity and water quality; • effect analysis of land use, landscape management, water use, control of waters, and other interventions modifying the state of the environment, furthermore providing scientific basis of actions aimed at restoration and the study of the background and relations of ecological processes on global, regional and local scale.
Geological and	http://www.mfgi.	Hungary	The Institute was established by the Hungarian Government in April 2012, uniting the

Geophysical Institute of Hungary	hu/en/node/754		Geological Institute of Hungary and the Eötvös Loránd Geophysical Institute. Both founding institutions have more than a hundred-year long history, and not only at national but also at international level can be considered as a pioneers in the field of geological and geophysical research. With the fusion of the two institutes, two complementary kinds of professional experience have been merged, which increases the efficiency of the institute on the field of geology, geophysics, mining, and climate policy. Our activities include the promotion of sustainable management of mineral and water resources of Hungary, as well as the research of the geological aspects of energy resources and the study of the processes within the Earth.
Research Centre for Astronomy and Earth Science, Geographical Institute, Hungarian Academy of Science	http://www.mtafki.hu/konyvtar/geobull_en.html	Hungary	*Scope of activities* Development of theoretical bases and methodology for physical, human and regional geography, studies on spatial processes and interrelationships; temporal and spatial survey of the interaction between man and environment; assessment of factors of the geographical environment with a special reference to natural and socio-economic resources and to the emerging socio-economic problems in the Carpatho-Pannonian area (mainly in Hungary); international cooperation; documentation and dissemination of research achievements (through volume of studies, periodicals and other publications in Hungarian and foreign languages).
Faculty of Natural Sciences, Moldavian Academy of Science	http://www.edu.asm.md/index1.php?go=page&p=36	Republic of Moldova	The Faculty of Natural Sciences offers BSc, Master and PhD programmes in natural sciences (biology, chemistry, geography, geology, etc).
Institute of Geology and Seismology, Moldavian Academy of Science	http://www.iges.asm.md/en/home	Republic of Moldova	**Main research directions:** • Seismic regime study of the Carpathian-Balkan region, seismic macrozoning of the territory of the Republic of Moldova, seismic microzoning of urban areas, seismotectonics and geodynamics. • Study of regional geology, lithology and stratigraphy of geological formations and minerals deposits tectonics and neotectonics; • Hydrodynamics and regime investigations of ground water in the Republic of Moldova, the ground water reserves and quality, hydrologic prognosis and riverbed processes of small rivers; • Study of the geochemical anthropogenic processes on the territory of the Republic of Moldova, improvement of geochemical monitoring, quantitative prognosis of environmental pollution, elaboration of methods for pollution localization and reduction.
Institute of Ecology	http://ieg.asm.md	Republic of	Main research directions:

and Geography, Moldavian Academy of Science	/old/ in Romanian	Moldova	• Dynamics and evolution of natural and anthropic geo and ecosystems in regional, local and cross-border context. • Elaboration of the Geoinformational system for environment and natural resources. • Integrated monitoring the environment and ecological reconstruction.
University of Bucharest, Faculty of Geology and Geophysics	http://www.unibuc.ro/facultati/geologie-geofizica/	Romania	The Faculty of Geology and Geophysics offers 3 BSc, 5 Master and PhD programmes, and has 4 departments: Geophysics, Geology, Geological Engineering and Mineralogy. Research centres within the faculty: • Bureau of expertise and consulting in Geophysics • Geology and Geophysics • Geology of charcoal deposits and environmental protection • Geology of hydrocarbon reservoirs • Geomatica • Geomedia • Lythos • Management of mineral resources and environmental protection • Applied petrology and metallogeny • Tectonics and environmental geology
University of Bucharest, Faculty of Geography	http://www.unibuc.ro/facultati/geografie/	Romania	The Faculty of Geography offers BSc, Master and PhD programmes. Departments: • Regional and Environmental Geography • Economic and Human Geography • Geomorphology – Pedology – Geomatics • Meteorology and Hydrology
University of Bucharest, Faculty of Chemistry	http://www.chem.unibuc.ro/	Romania	Graduation and post-graduation courses on Environmental Sciences-Environmental Chemistry (BSc, MSc, PhD).
University of Bucharest, Faculty of Biology	http://www.bio.unibuc.ro/	Romania	Laboratories for teaching and training. Affiliated research centres: • Multi-User Research Database - Molecular Biology • Neurobiology and Molecular Physiology Research Centre • Genetics Institute • Centre for Research, Training and Consulting in Microbiology, Genetics and Biotechnology • Systems Ecology and Sustainability Research Centre

			• Biochemistry and Molecular Biology Research Centre Chemistry lipids and glycolipids-Research Centre
University of Bucharest, Systems Ecology and Sustainable Development (Ecologie Sistemica si Dezvoltare Durabila) DESS	http://www.unibuc.ro/depts/biologie/ecologie_sistemica_si_dezvoltare_durabila/	Romania	Doctoral school and centre for studies (bachelor's and master's degree) in Systems Ecology and Sustainable Development; Research Centre of Systems Ecology, Eco-diversity and Sustainability (CCESES) which integrates the Faculty of Biology laboratories in Bucharest and the research stations located in Sinaia (mountain systems research) and Braila (for research in The Lower Danube); Centre for training, technical assistance and adaptive ecosystem management.
University of Bucharest, Centre for Environmental Research and Impact Studies - CCMESI	http://portiledefier.ro/ccmesi/	Romania	Single sited research unit, affiliated to university of Bucharest is activating from 20 years on the field of environmental sciences focusing on environmental impact studies, pollutants bioaccumulation studies, conservation and restoration strategies, having expertise in filed research. The objectives of CCMESI are: • To present practical solutions for current environmental problems; • To promote the concept of sustainable development in Romania; • To develop partnerships with universities, institutes and research centers, local and national authorities, • To offer training opportunities to young researchers interested in environmental research programs
University of Agronomic Sciences and Veterinary Medicine – Bucharest, Research Center for Sustainable Agriculture (Centru de Cercetare pentru Agricultura Durabila)	http://www.agro-bucuresti.ro/cercetare/centre-cercetare	Romania	Main objectives: Technological resources in sustainable agriculture; Fundamentals of plant technology in sustainable agriculture; Research and technological development in sustainable agriculture; Production and environmental quality in sustainable agriculture. Current infrastructure: · Laboratory of Soil Science; · Soil Physics Laboratory; · Laboratory of Soil Conservation; · Laboratory of soil biology; · Ecology Laboratory; · Research Laboratory for Optimization and Development of Sustainable Technologies in crops; · Laboratory of Agricultural Product Quality;

			· Laboratory of Genetics and Plant Breeding; · Laboratory of Plant Genetics; · Protection Laboratory slopes (Phytopathology, Entomology, Virology, Microbiology); · Experimental techniques laboratory; · Agricultural mechanization laboratory.
Babes-Bolyai University, Cluj, Faculty of Biology and Geology	http://bioge.ubbcluj.ro/	Romania	Laboratories: Laboratory of Cytology; Laboratory of Aquatic Ecology; Laboratory of Histology and Plant Anatomy ; Invertebrate Zoology Laboratory Research Centres: Centre for Electron Microscopy; the centre provides high performance Electronic Microscopy facilities. Its activities cover a large number of scientific domains: physics, chemistry, geology, mineralogy, geography, animal and plant biology (with special emphasis on cellular and molecular biology, biochemistry and physiology) pharmacology, human and animal medicine, ecology and environment protection, as well as industry areas, such as: food technology, mining, oil industry, metallurgy and chemical industry.
Babes-Bolyai University, Cluj, Research, education, consulting services in the field of environmental and occupational health - EHC	http://www.ehc.ro/Default.aspx	Romania	EHC is involved in developing research in the field of environmental and occupational sciences and training activities for young researchers and students from "Babes-Bolyai" University focusing health risk assessment of irritants and heavy metals. The laboratory is equipped with: Atomic absorption spectrometers with hydride generation system and graphit furnaces, X - Ray Fluorescence spectrometer, UV- VIS Spectrometers, Infrared spectrometers, GC with headspace, and GC-MS, Lead Care System, Digestors - chemical and microwave, Rotavapor, Incubators, Thermoreactors, Water and sand bath, Distilators, pH-meters, Hoots; Analyzers for emissions - electrochemical and infrared, Gas analyzers - electrochemical and infrared, Dust analyzers, Sound and noise dosimeters, Indoor air quality analyzers, Ionizing and electromagnetic radiations and light analyzers, Thermoanemometers and velometers, Pitotmeters, sampling equipment, personal sampling equipment, Rotameters, Calibration devices from pumps to rotameters and noise, other sampling and analytical devices.
"Alexandru Ioan Cuza" University of Iasi, Faculty of Biology	http://www.bio.uaic.ro/#home/home.html	Romania	Teaching and research in the following main domains: • Biology • Biochemistry Biodiversity, Modern biotechnologies, Ecology and environmental protection, Pest genetics, Plant physiology
"Dunarea de Jos" University of Galati, Galati, The European Centre of Excellence	http://www.ecee.ugal.ro/	Romania	Ensuring the excellence in environmental and life sciences research and cross-cutting domains by: - taking part in national and international networks dealing with environmental issues; - joining local and national administration partners in organizing projects concerning

for the Environment - ECEE			environmental protection, sustainable development and studies of the influence of environmental factors on the population's health; -training specialists in various fields pertaining to the environment; -providing consulting and expertise in a wide range of environmental issues; -organizing students and teaching staff exchange, financially supported by international institutions granting scholarships or by ECEE partners in international projects granting funds from their budgets; -organizing national and international conferences, seminars, work-shops on aspects directly or indirectly connected with monitoring the environment, its quality and management. ECEE is the only European centre of excellence in research from Romania included in the International Network for Sustainable Management.
Ovidius University of Constanta, Centre for the Study of Biological Diversity	http://www.stiintele-naturii.ro/centrul-de-documentare-pentru-studiul-biodiversitatii	Romania	Main objectives: • Building and maintain a database on marine biodiversity and terrestrial biodiversity of Dobrogea; • Studying the new invertebrate species from the Black Sea, their ecology and their impact on native species and associations of organisms; • Monitoring of ecological status of protected areas in Dobrogea; • Working with local authorities, non-governmental organizations and the media to raise awareness of the public about the problems posed by preserving biodiversity.
National Institute of Research and Development for Biological Sciences-NIRDBS	http://www.dbioro.eu/	Romania	The institute is a Center of excellence in life sciences, promoting fundamental and applicative research in the field of life sciences by multidisciplinary research, from cellular and molecular biology, biotechnology biodiversity, up to ensuring the appropriate consultancy, covering scientific and socio-economic interests, equally involved in national and international networking. The head-quarter is established in Bucharest and has 2 branches: Institutes of Biological Researches Cluj Napoca (ICB Cluj-Napoca) and Iaşi (ICB Iasi) and 1 subsidiary, Centre of Biological Researches „Stejarul" Piatra Neamţ (CCB P. Neamt). There are three main directions of activity: biomedical research (including cell and molecular biology, tissue engineering, etc.), agriculture and food researches and biodiversity researches. All these directions are sustained and correlated by a horizontal structure which consists in: bioanalysis, bioinformatics, bioproducts and biotechnologies.
The National Institute for Research and Development of Marine Geology and	http://www.geoecomar.ro/website/en/index.html	Romania	NIRD GeoEcoMar is a research and development institute of national interest, performing research in geology, geophysics and geoecology, with focus on aquatic, marine, deltaic and fluvial environments. NIRD GeoEcoMar represents an excellence pole in the marine research, working as a

Geoecology – GeoEcoMar, Bucharest and Constanta			European and national center for studies of sea-delta-fluvial macrosystems. A modern research infrastructure, based mainly on marine and fluvial research vessels, enables GeoEcoMar to undertake complex, multidisciplinary studies in national and international programs. **NIRD GeoEcoMar** participates in projects within the European Framework Programs 6 and 7, including bilateral cooperation with France, Germany, the Netherlands and Switzerland.
Danube Delta National Institute for Research and Development (DDNIRD), Tulcea	http://www.ddni.ro/	Romania	Danube Delta National Institute for Research and Development is located in Tulcea, the town at the entrance to the Danube Delta. The institute carries out basic and applied research to scientifically support the management in the Danube Delta Biological Reserve and other wetlands of national and international importance for the biodiversity conservation and sustainable development.
National Institute for Marine Research and Development "Grigore Antipa" Constanta	http://www.rmri.ro/	Romania	The National Institute for Marine Research and Development "Grigore Antipa" Constanta is mainly involved in basic research and applied technology, crucial for the understanding, protection and management of coastal and marine environment in the economic exclusive zone of Romania at the Black Sea coast. NIMRD is entitled to propose the Ministry of Environment and Climate Changes regulations in the field and represent Romania in the field of marine science with different organizations and expert groups of international conventions it is part in. NIMRD is the technical operator of the national network of physical, chemical and biological monitoring and coastal erosion surveillance.
The National Research – Development Institute for Industrial Ecology– ECOIND, Bucharest	http://www.incdecoind.ro/	Romania	INCD ECOIND is an institution of national and international interest in the field of environmental research and services. INCD ECOIND is professionally equipped, at European level, for pollution control, pollution assessment and research of environmental technologies - laboratory and field equipment. The institute is permanently capitalizing the results of completed research, through transfer to economical units/public authorities - partners in projects, as well as by a wide dissemination of the most important results.
University of Belgrade - Faculty of Chemistry; Faculty of Biology; Faculty of Geography; Faculty of Mining and Geology.	http://www.chem.bg.ac.rs; http://www.bio.bg.ac.rs	Serbia	The existing facilities comprise: Superconducting Fourier-Transform NMR Spectrometer AVANCE 500 MHz, Parr Hydrogenization system up to 200 barr, System for synthesis and purification of small physiologycally active molecules consisting of glove box, microwave reactor and Biotage chromatography system, GC-MS, Elemental analysis system, UV/VIS spectrophotometer, Waters Breeze HPLC system with electrochemical detection as well as many other synthetic and analytical equipment. Faculty of Biology infrastructure comprises advanced light microscopy facilities: Laser scanning confocal microscope LSM 510 Carl Zeiss GmbH bsed on Axioskop FS2mot upright microscope with three lasers Ar (457,478,488, 514 nm) He/Ne 543 nm and 633 nm and three recording channels + transmittance channel with time-series physiology software. Integrated

			Electrophysiology “patch-clamp” setup HEKA EPC8 Cell culturing facility. A.S. Vent Light with regulation of volume flow, temperature, air humidity, and pressure and air-change rate. The research infrastructures are open towards external users, which is enabled through bilateral third party contracts and time lease agreements.
University of Novi Sad, Faculty of Science	http://www.uns.ac.rs/en/fakulteti/pmf/osnovna.htm	Serbia	The University of Novi Sad was founded on 28 June 1960. Today it comprises 14 faculties located in the four major towns of the Autonomous Province of Vojvodina: Novi Sad, Subotica, Zrenjanin, and Sombor. The University of Novi Sad is now the second largest among six state universities in Serbia. The main University Campus, covering an area of 259,807m², provides the University of Novi Sad with a unique and beautiful setting in the region and the city of Novi Sad. Having invested considerable efforts in intensifying international cooperation and participating in the process of university reforms in Europe, the University of Novi Sad has come to be recognized as a reform-oriented university in the region and on the map of universities in Europe. Faculty of Sciences represents an educational and scientific institution where students gain knowledge and conduct research in the fields of Biology, Chemistry, Physics, Mathematics, Computer Science, Geography, Tourism and Environmental Protection.
Institute of Molecular Genetics and Genetic Engineering	http://www.imgge.bg.ac.rs	Serbia	The major activities of the Institute are oriented towards fundamental research in molecular biology, molecular genetics, recombinant DNA technology and biotechnology. In the field of fundamental research, Institute's projects are mostly focused on research related to analysis of genome organization and regulation of gene expression in different organisms.
Faculty of Natural Sciences, Comeniu University of Bratislava	http://www.fns.uniba.sk/?1708	Slovakia	The Faculty of Natural Sciences (FNS) is presently one of the largest faculties of Comenius University, in both the number of staff members and students. It provides Bachelor, Master and PhD programmes.The basic research and educational units of the Faculty are the Departments and Institutes, which are organised in five sections: Biology, Chemistry, Environmental Science, Geography and Geology.

Excellence Centre for Biotechnologies and Biomedicine at CU (ECBBCU)	http://www.uniba.sk/index.php?id=1238	Slovakia	The aim of the CEBBCU is to provide education and research in the sphere of biotechnology and biomedicine in accordance with the needs of the Slovak Republic and thus become an integral part of research in Europe. This aim will be met predominantly as a result of a synergic effect of coordinated connection between research within natural sciences and biomedicine. The research capacities and infrastructure of the Faculty of Natural Sciences, the Faculty of Medicine, the Jessenius Faculty of Medicine, the Faculty of Pharmacy, the Faculty of Mathematics, Physics and Informatics, the Faculty of Physical Education and Sports, and the Faculty of Management will become the focus of activities. The interconnection between the top experimental research and clinical workplaces with modern managerial attitudes is just the inevitable prerequisite for successful application of biotechnologies in the area of health protection. Comenius University has achieved the best prerequisites for achieving this goal thanks to its structural organization. Building up the ECBBCU will be supported also by the parallel enhancement of infrastructure of the participating workplaces of Comenius University.
Water Research Institute Bratislava	http://www.aquamedia.at/Water-Research-Institute-Bratislava.2713.0.html	Slovakia	**A national organization charged with the task of performing complex water management research throughout Slovakia as well as in the international scientific-technical arena.** The Institute has been solving extensive multidisciplinary projects and specific problems of water management in its territory in time and space, estimating quantitative and qualitative parameters of water, using the most advanced methods of mathematical and physical modelling of the water movement processes in the natural environment, with identification and regulation of the effect of antropogenous activity in the hydrosphere. On the basis of the hydrologic, hydraulic, hydrochemical and hydrobiological research carried out at the WRI many water supply, hydropower and agricultural reservoirs have been constructed and successfully operated, and thousands of kilometres of water streams have been trained in Slovakia. New drinking water treatment and wastewater treatment technologies, designed at the WRI, serve for designing new, reconstructed, extended or intensified sanitary engineering and water works structures. National reference laboratory for water sector is the centre of excellence for analysis of water and matrices in Slovak Republic.
Taras Shevcenko National University of Kiev, **Faculty of Geography;** **Faculty of Geology;**	http://www.univ.kiev.ua/en/dep	Ukraine	Taras Shevchenko National University of Kyiv is today a classic university with a distinct research profile, and the leading contemporary academic and educational hub of Ukraine. The high status of a classical research University is underpinned by the numerous academic achievements of its staff. The University awards Junior Specialist's, Bachelor's, Specialist's and Master's degrees, Higher Qualification Post-graduate degrees and Doctoral degrees. Training and retraining programs are provided in 12 specialties of Junior Specialist

Faculty of Chemistry; Institute of Biology			qualification, 49 fields of Bachelor training programs, 60 areas of Specialist training programs and 94 fields of Master training programs.
National University of Life and Environmental Sciences of Ukraine	http://nubip.edu.ua/en/about/	Ukraine	National University of Life and Environmental Sciences of Ukraine is one of the leading educational, scientific and cultural establishments of Ukraine. Over 37ths students and more than 600 PhD, Doctoral students and Students-seekers are studying at 21 faculties of Kyiv Territorial Center, at Southern Affiliate "Crimean Agro-Technological University" and at 12 regional higher educational institutions of l-lll accreditation levels. Over 3000 scientific-pedagogical and pedagogical staff including 300 Professors and Doctors, more than 1200 PhDs and Associate Professors provide educational process and scientific research at NUBiP of Ukraine.
The A.O. Kovalevsky Institute of Biology of the Southern Seas (IBSS), National Academy of Sciences of Ukraine	http://ibss.nas.gov.ua/	Ukraine	IBSS includes 13 scientific departments, the Aquarium-Museum, scientific library, the editorial and publishing department, and the R/V *Professor Vodyanitsky*; the Branch in Odessa has 4 research departments.
Ukrainian scientific center of Ecology of Sea (UkrSCES)	http://www.sea.gov.ua/	Ukraine	The Ukrainian Scientific Centre of Ecology of the Sea (UkrSCES), Ministry of Environmental Protection of Ukraine (UkrSCES) was founded in January in 1992 on the basis of the Odessa Branch State Oceanographic Institute. It is the main institution of the Ministry of Environmental Protection of Ukraine in the field of marine ecological researches. UkrSCES – is a unique institution of all state ecological systems of monitoring within the Black and Azov Seas, which provides a whole complex of tasks of the ecological monitoring. The main task of UkrSCES is scientific and practical providing of realization of public policy of Ukraine in relation to the protection, rational use and rehabilitation of natural resources of the Black and Azov Seas basin, and also providing implementation of international obligations of Ukraine, in relation to marine aspects.
Ukrainian Scientific Research Institute of Ecological Problems (USRIEP)	http://www.niiep.kharkov.ua/	Ukraine	In accordance with the Charter of the Ukrainian Research Institute of Ecological Problems "UkrNDIEP" (new edition), registered by the executive committee of Kharkiv city council Kharkiv Oblast February 4, 2005, the Institute is a state enterprise in the system Minpryrody Ukraine, established to provide scientific public policy in Ukraine environmental protection, natural resources, environmental safety, as well as Ukraine's international obligations arising from the signed conventions, agreements, contracts, etc..

7.1.2. Anexa 2 – Descrierea potentialului tehnic si stiintific al infrastructurilor existente, programelor si initiativelor din Regiunea Dunarii (selectii)

Project/Programme Data file

Name	
ALSO DANUBE - Advanced Logistic Solutions for Danube Waterway It is an open virtual network, based on a broad European approach, linked actors in logistic chains by interconnecting existing information and communication systems via a Common Source Logistic Database (CSL.DB), interactively related to traffic management systems. Web based client applications, advanced EDI solutions and innovative telematic technologies were integrated, demonstrated and evaluated within different supply chains	
Category	
FP5 Project	
Status of the project	***Category***
Started in 2000, ended in 2013	
Location	
EU – coordination office in Vienna	
Proposed objectives	
• develop and implement an advanced European concept to manage intermodal transport chains with inland navigation as core transport mode; • set up and run highly integrated logistic networks and operational platforms to enlarge the current range of logistic services; • integrate advanced traffic and transport management systems; • introduce new systems and technologies in the area of data exchange and communication; • create independent logistic information and communication services; • stimulate the extension of waterway transport relations to port hinterland and combined cargo; • improve the efficiency of Danube transport which shall contribute to the development of the Danube waterway as a backbone for European transports; • promotion and lobbying for inland waterway transport. More info on: http://www.alsodanube.at/	
Description	
The developed IT-solutions are enabling the interlinking of traffic and transport management on inland waterways and are supporting thus the realisation of the ALSO DANUBE concepts. IT-solutions summarised are: • CSL.DB (Common Source Logistic Database), the comprehensive logistic database for the interlinking of traffic and transport information and for establishing an information network between the actors in the transport chain. • ETNA (European Transport Network Application), the web-information portal for multimodal liner-services schedules in Europe. • LOMAX, the lock management system for the planning of locking procedures and for supporting traffic management. • AIM (Application Interconnectivity Manager), the communication interface between the CSL.DB and company specific applications, with special focus on the conversion of EDIFACT messages. • ILLONET, the extension of a company specific planning application with traffic information out of DoRIS. • Billing and monitoring application for the management of container liner services. • Resource planning application for the management of Door-to-Seaport transports	

• Online logbook and fleet management system for container liner services on the Danube.
Human resources
N/A
Scientific agenda
The aim of ALSO DANUBE to promote inland navigation focused not only on the development of appropriate IT solutions, but also on ideas to create a "friendly" business environment for waterborne transport in managed intermodal logistics chains. Thus a multitude of results is available after the finalisation of the project. For a better understanding the results are grouped into four main groups: • Concepts • IT-solutions • Demonstrations • Socio-economic assessment The developed concepts and IT-solutions were tested in the demonstration scenarios, whilst the promotion activities were accompanying the project throughout its whole runtime. The socio-economic assessment forms the description of the contribution of the developed concepts and IT-solutions for the European society and economy.

Project/programme Data file

Name	
DANUBE FLOODRISK This project has a far reaching strategic focus beyond risk management and could become a flagship project for the SEE programme. It will improve safer sustainable conditions for living environment and economy in the Danube floodplains. It integrates stakeholders and different acting groups and disciplines.	
Category	
Project in South East Europe Transnational Cooperation Programme	
Status of the project	***Category***
Started in 2009, ended in 2012	
Location	
South-East-Europe	
Proposed objectives	
The DANUBE FLOODRISK project focuses on the most cost-effective measures for flood risk reduction: • risk assessment; • risk mapping; • involvement of stakeholders; • risk reduction by adequate spatial planning. More info on: http://www.danube-floodrisk.eu/2009/11/about/	
Description	
The project will bring together scientists, public servants, NGOs and stakeholders who develop jointly a scalable system of flood *risk maps* for the Danube River floodplains. Transnational *methodology and models* will be defined and implemented for flood risk assessment and mapping. This results in proposals for flood mitigation *measures, adjustments of spatial development plans*, *assessment tools* for economic development in flood plains and raised *awareness* of flood risk of stakeholders, politicians, planners and the public. Infrastructures at risk like industry, power stations and supply infrastructure will be considered in the project.	
Human resources	

N/A
Scientific agenda
Flood risk increases with ongoing climate change. Despite the fact that flood events are natural processes, which occurred in the past and will also occur in the future the situation gets worse, especially in terms of financial losses. The increase of industrial and urban settlements in floodplains during recent years and decades, which causes an accumulation of values in areas at risk, leads to immense damages in case of flooding. The catastrophic flood events 2006 in the Danube Basin in particular reveal the vulnerability of our society against extreme natural events. However, the question of occurrence of an event is closely related with the question of the risk, i.e. the consequences (damages) resulting from this event. With the increase of population and industrialization, the settling areas and land use activities spread in floodplain areas seeming protected or hardly affected. Economic values behind dykes and flood protection structures accumulate more and more, hence they increase significantly the potential damage of extreme flood events. It is a matter of all Danubian countries involved to counter this development of flood risks. Partners from the Danube countries proposed a three years EC Interreg Project for the Danube Flood Risk delineation, which may contribute with knowledge to understand the processes and which provide the tools to improve risk management in practice.

Project / Programme data file

Name	
DANUBEPARKS - The Danube River Network of Protected Areas DANUBEPARKS is a network of Protected Areas along the Danube, currently comprising 15 areas represented by different partner institutions (public authorities, public enterprises, NGOs). The Network cooperates in different fields of work that are important to all partners and where solutions depend on a transnationally coherent strategy.	
Category	
Status of the project	***Category***
Started in 2009, ended in 2012 Step 2 started in 2012 will end in 2014	
Location	
EU – Danube basin	
Proposed objectives	
• enhance nature conservation of Danube River Protected Areas; • manage Danube Protected Areas wisely; • exchange and promote expertise in management; • improve knowledge of the ecological status of the river, as well as the the economic, social and environmental impacts and the management of the Danube Protected Areas; • take actions for the prevention, control and reduction of pollution in the floodplains and wetlands in the Danube Basin; • promote awareness of the international importance of the Danube River; • promote sustainable development; • influence the implementation and future development of public policies. More info on: http://www.danubeparks.org/	
Description	
Human resources	
N/A	
Scientific agenda	

- **River Morphology and Revitalisation;** The *DANUBEPARKS Strategy on Conservation and Navigation*, including ways to deal with river engineering projects and their impacts on nature in the Protected Areas, and the *Danube River's Morphology and Revitalisation*, assembling experiences from the past.Additionally, several demonstrative and innovative revitalisation projects were implemented (e.g. opening of river branches, adaptation of groyns), and study visits as well as an international workshop were organised.
- **Floodplain Management and Habitat Network**: During this project cross-border management plans for the AT-SK, HU-HR and HU-RS areas were developed as a basis for more coherent nature management. The "Perspectives for Danube Floodplain Forests" laid down the general goals of the Protected Areas regarding future implementation measures in forestry. Last but not least, pilot projects (e.g. planting of native trees, mowing and grazing) and study visits, also with external stakeholders, were implemented.
- **Protection of Danube Flagship Species**: White-tailed Eagle and Danube Sturgeon both demonstrate the necessity of an interlinked and uninterrupted habitat network along the Danube. For Sturgeons, cooperation was started with research institutions and communication tools were established. The *Action Plan for White-tailed Eagle at the Danube River* – developed together with experts – was adopted and published by the Council of Europe / Bern Convention. A *White-tailed Eagle Database* was established online to collect international monitoring data coherently.
- **Monitoring and Natura2000**: Handbooks and studies were published to enhance management and monitoring of important species, such as Beaver or European Mink, or general Natura2000 areas. An online database for fish monitoring data has been established. The results of the Danube-wide monitoring of Little-ringed Plover and Sandmartin (indicator species for dynamic river sections) demonstrate the need for further revitalisation and protection.
- **Danube Nature Tourism**: The Joint Ranger Training in 2010 provided the basis for many Protected Areas to guide foreign visitors and communicate to visitors the necessity of transnational cooperation. A Position and Action Plan for tourism and environmental education now serves as the basis for future actions. Several Protected Areas also developed pilot offers (boat and bike tours, nature trails). Communication tools such as the joint tourism brochure and online tourism platform help in marketing the newly established offers.

Project / Programme data file

Name	
EnviroGRIDS **Building Capacity for a Black Sea Catchment Observation and Assessment System supporting Sustainable Development**	
Category	
FP7 Project	
Status of the project	***Category***
Finished	Relations can be developed between DANUBIUS and the community that administer and uses the data portal.
Location	
Black Sea Catchment Area	
Proposed objectives	
General objectives: The scientific aim of the EnviroGRIDS project is to assemble an observation system of the Black Sea catchment that will address several GEO Societal Benefit Areas within a changing climate framework. This system will incorporate a shared information system that operates on the boundary of scientific/technical partners, stakeholders and the public. It will contain an early warning system able to inform in advance decision-makers and the public about risks to human health, biodiversity and ecosystems integrity, agriculture production or energy supply caused by climatic, demographic and land cover changes on a 50-year time horizon.	

Technical objectives: The generic technical objectives of the EnviroGRIDS project are to:

- run a gap analysis of existing regional observation systems to prepare recommendations for improvement of networks of data acquisition in each region/country,
- build capacity on observation systems in the Black Sea catchment,
- improve regional network to coordinate the efforts of partners active in observation systems
- link, gather, store, manage and distribute key environmental data,
- develop the access to real time data from sensors and satellites,
- create spatially explicit scenarios of key changes in land cover, climate and demography,
- distribute large calculations and datasets on large computer clusters,
- streamline the production of indicators on sustainability and vulnerability of societal benefits,
- provide a standard for integrating data, models and information and communication tools,
- provide policy-makers and citizens with early warning and decision support tools at regional, national and local levels.
- produce innovative tools to visualize and interpret data and results of integrated models,
- alert citizens concerning exposure to environmental risks,
- build capacities in the implementation of many new standards and frameworks (INSPIRE, GEOSS, OGC,..).

Beyond state-of-the-art: EnviroGRIDS is clearly going beyond the state of the art in the Black Sea region by adopting a catchment approach and by tackling several societal benefits areas together. By using the most powerful computer network of the world it is clearly showing the direction on how to analyse the increasing amount of global data made available throughout the planet. It is bringing crucial information in a relatively data-poor region on future scenarios of expected climate, demographic and land cover changes. Based on the outputs of these scenarios it is building geoprocessing services in key societal benefits areas that will be connected back to the GEOSS.

Main innovations:

- Contribute to free publicly-funded data through interoperable databases and services
- Streamline data process from data warehouses, to scenarios, hydrological models, impacts assessments and finally to disseminations tools.
- Use grid enabled computer technology to store and analyse environment data
- Gridify the code of hydrological model calibration and validation
- Create regional scenarios of development in function of expected climate, land cover and demographic changes
- Build efficient virtual and life trainings on EnviroGRIDS main topics
- Make available useful open source software and data on DVD and on Internet
- Raise public and decision-makers awareness through innovative collaborative systems
- Provide an early warning system to inform the citizens and decision-makers on environmental vulnerability and risks associated to selected Societal Benefit Area

Description

BSC-OS Portal

Grid - enabled Spatial Data Infrastructure (GSDI) becoming one of the integral systems in the Global Earth Observation System of Systems (GEOSS), and compatible with the new EU directive on Infrastructure for Spatial Information in the European Union (INSPIRE), as well as UNSDI developments.

Human resources
>100
Scientific agenda
Environmental data

Project / Programme data file

Name	
PEGASO - People for Ecosystem-based Governance in Assessing Sustainable Development of Ocean and Coast	
Category	
FP 7 project	
Status of the project	***Category***
Ongoing	
Location	
Black Sea and Mediterranean basins	
Proposed objectives	
• To construct an ICZM (Integrated Coastal Zone management) governance platform, consistent with the aims of article 14 of the ICZM protocol for the Mediterranean, to support the development of integrated policies for the coastal, marine and maritime realms of the Mediterranean and Black sea basins. • To build in collaboration a spatial data infrastructure (SDI) for the Mediterranean and the Black Sea. Supporting and creating local geonodes, in order to deliver a Mediterranean and Black Sea harmonised sets of data, accessible through an Internet viewer. • To refine and further develop efficient and easy to use tools for making sustainability assessments in the coastal zone • To test and validate the assessment tools at regional and local scales to understand both global and cumulative local trends and how they interact in specific coastal and marine regions. • To establish and strengthen mechanisms for networking and capacity development so as to promote knowledge transfer and the long-term use of the project outputs. • To establish and strengthen mechanisms for networking and diffusion of PEGASO outputs so as to enlarge network of interested stakeholders and the large public. More info on: www.pegasoproject.eu	
Description	
Spatial Data Infrastructure (SDI), following the INSPIRE Directive, to organize and standardize spatial data to support information sharing on an interactive visor, to make it available to the ICZM Platform, and to disseminate all results of the project to the end users and interested parties.	
Human resources	
>1000	
Scientific agenda	
The main goal of the PEGASO project is to construct a shared Integrated Coastal Zone Management (ICZM) Governance Platform (figure 1) with scientists, users and decision-makers linked with new models of governance.	

Project / Programme data file

Name of the infrastructure

FAST – Foreshore Assessment Using Space Technology	
Category of infrastructure	
FP 7 project	
Status of the project	***Category of infrastructure***
Ongoing	
Location	
Black Sea, Cadiz Bay, North Sea	
Proposed objectives	
FAST is a multi-disciplinary project that aims to study the role of vegetation in flood risk mitigation, as a cost-effective flood defence solution. Using a combination of remote sensing and field data from foreshores in four different EU countries (The Netherlands, UK, Romania and Spain), FAST will look at how specific characteristics of vegetated foreshores affect wave energy and erosion and develop novel ways to get the information needed from satellite images, so as to predict shoreline protection. All this know-how will be developed, in close collaboration with end-users, into an easy-to use service (presently code named MI-SAFE). MI-SAFE will be a sustainable, long-term contribution to European flood risk management, allowing governmental agencies, industry consultants, NGOs and Citizens, to easily assess the potential of vegetated foreshores in reducing flood and erosion risks.	
Description of the current infrastructure	
The FAST approach fuses recent advances in integrated coastal zone management (ICZM), climate change adaptation and the application of ecosystem services concepts into a next generation software package for foreshore management based on the unprecedented spatio-temporal coverage of the ambitious European Earth Observation Programme Copernicus (www.copernicus.eu). Using an agile development approach end-users will cooperate throughout the entire project, providing input into the selection of case study sites, fieldwork, algorithm development and strategies to ensure the long-term sustainability of the service (presently code named MI-SAFE).	
Human resources	
>100	
Scientific agenda	
1. Linking data from satellite images to the biophysics of coastal wetland systems. 2. Developing generic algorithms for the classification of coastal wetland characteristics on satellite images. 3. Linking biophysical characteristics of coastal wetlands to wave and/or flow attenuation and erosion/deposition patterns for different water levels and wave heights/flow speeds through field measurements. 4. Translating the effects of foreshores and floodplains on waves/flow and stability into impacts on engineering requirements for flood safety infrastructure. 5. Developing a service for the improvement of flood and erosion risk management strategies in coastal wetlands, including a prototype user-friendly software tool (MI-SAFE) where linkages between biological and morphological features of foreshores/floodplains and requirements for flood safety infrastructure are automated.	

Project / Programme data file

Name of the infrastructure	
RISES-AM - Responses to coastal climate change: Innovative Strategies for high End Scenarios -Adaptation and Mitigation	
Category of infrastructure	
FP 7 project	
Status of the project	***Category of infrastructure***
Ongoing	
Location	
Black Sea, Mediterranean Sea, North Sea	

Proposed objectives
Coastal areas concentrate vulnerability to climate change due to high levels of population, economic activity and ecological values. RISES-AM addresses the economy-wide impacts of coastal systems to various types of high-end climatic scenarios (including marine and riverine variables). It encompasses analyses from global to local scales across the full range of representative concentration pathways (RCPs) and shared socio-economic pathways (SSPs). It considers the still significant uncertainties in "drivers" (physical and socio-economic) and coastal system responses (e.g. land loss or uses, biological functions, economic productivity) within a hazard-vulnerability-risk approach. The emphasis is on the advantages of flexible management with novel types of coastal interventions (e.g. "green" options) within an adaptive pathway whose tipping points will be identified/quantified in the project.
Description of the current infrastructure
NA
Human resources
>100
Scientific agenda
The assessment of impacts and adaptation deficits will be based on modelling tools that will provide a set of objective and homogeneous comparisons. The extended/improved suite of models will be applied across scales and focusing on the most vulnerable coastal archetypes such as deltas, estuaries, port cities and small islands. This will lead to a motivated analysis of the synergies and trade-offs between mitigation and adaptation, including what level and timing of climate mitigation is needed to avoid social, ecological and economic adaptation tipping points in coastal areas. We shall evaluate the direct and indirect costs of high-end scenarios (e.g. the increasing demand for safety under increasingly adverse conditions) for coasts with/without climate change and contribute to determining which policy responses are needed at the European and global levels in the context of international climate discussions. The project will finally transfer results to authorities, users and stakeholders from all economic sectors converging in coastal zones, including the climate research community dealing with more generalistic assessments.

Project / Programme data file

Name	
Akademik - Oceanographic Multipurpose Research Vessel belonging to IO-BAS - Institute of Oceanology - Bulgarian Academy of Science.	
Category	
RV (research vessel)	
Status of the project	***Category***
In use/ongoing	Possible node in Bulgaria
Location	
Bulgarian coast and the Black Sea	
Proposed objectives	
Description	
General characteristics: Length: 55.5 m Beam: 9.80 m Draft: 4.80 m Gross tons: 905 Power: 1000 HP Range 7500 n.mi Endurance: 35 days Cruise speed: 9.5 kt Max. speed: 10.5 kt	

Equipment on board: Fixed equipment Navigation and communication Nav. equip: Radar Loran Decca SatNav Gyro DopLog Acoustic Echosounders for scientific research: 12kHz 27kHz Oceanographic Oceanographic winches: number: 3 Gantry Crane Electronic data processing equipment permanently available on board
Human resources
Crew: 22 Scientists: 20
Scientific agenda
Multidisciplinary research of the Bulgarian coast and the Black Sea

Project / Programme data file

Name	
Argus – Serbian River Research Vessel	
Category	
RV (research vessel)	
Status of the project	***Category***
In use/ongoing	Possible node in Serbia
Location	
The entire sector of the River Danube (Joint Danube Survey 3) and tributaries	
Proposed objectives	
Description	
- cruising speed: 25 km/h (13 km/h upstream), - Dimensions: 33.0 x 4.5 m, drought: 1.35 m, height: 5 m, - Additional equipment: - Bacterial incubator HASH small, - Binocular Magnifier, - Microscope, - Automatic dozers 40 ml 2 pcs, and 25 ml 2 pcs, - Microbiological incubators, - Available cooling capacities: 2 x 60 L refrigerators.	
Human resources	
Crew - 5 and scientists on - board - 12.	
Scientific agenda	
- The R/V Argus can perform hydrologic measurements, biological sampling and observations.	

Project / Programme data file

Name
Carina - coastal and river research boat
Category

Coastal and river research boat	
Status of the project	***Category***
In use/ongoing	Existing facility in Romania
Location	
Romanian sector of the River Danube, the Danube Delta, including the Razelm - Sinoie lagoon complex and on the coastal area of the Black Sea.	
Proposed objectives	
Description	
- 6m long - Diesel Engine of 150 HP - Scientific equipment can be used on board (ADCP, echosounder, sediment sampling, CTD, etc.)	
Human resources	
Crew -15 and places for on-board technical staff - 3.	
Scientific agenda	
- The coastal and river research boat can perform geological - sedimentological and geophysical studies, hydrologic measurements, biological sampling and observations.	

Project / Programme data file

Name	
Halmyris – Floating Laboratory	
Category	
Floating Laboratory	
Status of the project	***Category***
In use/ongoing	Existing facility in Romania
Location	
Danube Delta	
Proposed objectives	
Description	
- Main technical characteristics: length -30,00 m, width - 5,00 m, maximum draft - 0,51 m, gross tonnage - 90 t. - With two laboratories and a conference room, Halmyris is an important component of the GeoEcoMar infrastructure.	
Human resources	
Crew - 2 and scientists on - board - 20.	
Scientific agenda	
- The floating laboratory facilitates the accomplishment of field works in geology and sedimentology, geoecology, geo- and hydrochemistry, hydrology and biology for the Danube Delta and the littoral area situated in front of the Delta. The floating laboratory also hosts scientific conferences, workshops, summer schools with national and international participation, as well as thematic field trips to promote geology and geoecology.	

Project / Programme data file

Name

Istros – Romanian River and Coastal Research Vessel	
Category	
RV (research vessel)	
Status of the project	***Category***
In use/ongoing	Existing facility in Romania
Location	
The entire sector of the Danube River (mother ship for Joint Danube Survey 3), the Danube Delta, including the Razelm - Sinoie lagoon complex and the coastal area of the Black Sea.	
Proposed objectives	
Description	
- Main technical characteristics: length – 32 m, width – 6.80 m, maximum draught: 1.10 m, tonnage – 110 t, 2 engines x 420 HP. - Laboratories on board – 3. - Scientific equipment: SEABEAM 1050 Elac-Nautik - multibeam bathymetric system, moonbeam bathymetric system Ceeducer Bruttour Int. Pty., gravity corers (3 m and 6 m long), VanVeen boden-greifers, A frame, 2 small winches.	
Human resources	
Crew - 5 and scientists on - board - 10.	
Scientific agenda	
- The R/V Istros can perform geological - sedimentological and geophysical studies, hydrologic measurements, biological sampling and observations.	

Project / Programme data file

Name	
Mare Nigrum – Romanian Multidisciplinary Marine Research Vessel	
Category	
RV (research vessel)	
Status of the project	***Category***
In use/ongoing	Existing facility in Romania
Location	
Romanian coast and the Black Sea	
Proposed objectives	
Description	
- Main technical characteristics: length - 82 m, breadth - 16,30 m, maximum draft - 5 m, gross tonnage - 3200 t. - Equipment on-board: multibeam bathymetric system, SeaBird CTD/Rosette sampler, multicorer - Mark II-400, side scan sonar, acoustic Doppler profiler, sub-bottom profiler, ROV, winches and cranes. - R/V Mare Nigrum is a main component of GeoEcoMar infrastructure which enables the understanding of the marine environment.	
Human resources	
Crew - 25 and scientists on - board - 25.	
Scientific agenda	
Multidisciplinary Marine research vessel in the Black Sea: - Studies on geology and evolution of the Black Sea and other marine zones in	

the World Ocean; - Geological and sedimentological mapping of the Black Sea continental shelf; - Single beam and multibeam echosounding:acquisition, processing and interpretation; - Sub-bottom profiling and side scan sonar acquisition, processing and interpretation; - Geochemical studies; - Seismo-Acustic acquisition; - Biological studies; - Hydro-Topography and Geophysical studies; - Gravimetry and Magnetometry; - Ecotoxicology; - Paleobiology and Paleontology;

Project / Programme data file

Name	
Wien – Austrian private ship for the fish survey	
Category	
Private ship for fish survey	
Status of the project	***Category***
In use/ongoing	
Location	
The entire sector of the River Danube (Joint Danube Survey 3) and tributaries	
Proposed objectives	
Description	
- Total length: 20,4 m - Width: 3,8 m - Draught: 1,2 m - Engine: 2x 200 hp - Max. speed (rel. to water surface): 22 km/h downstream	
Human resources	
Crew - 3 and scientists on - board - 3.	
Scientific agenda	
- The ship can perform biological, fish sampling and observations.	

7.2. Conferinta Internationala "Potentialul tehnico-stiintific privind managementul integrat al sistemului Dunare – Delta Dunarii – Marea Neagra. Realitati si planuri pentru viitor" 17-18.03.2014

7.2.1. Anexa 3 - Minuta intalnirii

International Conference „Technic and scientific potential of the integrated management of Danube – Danube Delta – Black Sea system. Realities and future plans"

1. Welcome and introductions

The meeting started on 17.03.2014 with the welcoming address of Dr. Gheorghe Oaie, General Director of the Romanian National Institute of Marine Geology and Geoecology.

He showed the importance of DANUBIUS – RI as a future pan-European infrastructure and multi-disciplinary project, pointing out that relations must be created between FP7 project DANCERS (Building Excellence in the Danube Region) project and DANUBIUS – RI.

Formal around the table introductions followed, then discussions started.

2. New Research and Innovation opportunities provided by the Horizon 2020 Programme in the Danube Region

Dr. Viorel Vulturescu, Director for European Integration and International Cooperation in the Romanian Ministry of National Education presented the main opportunities provided by the Horizon 2020 programme in the Danube Region.

Horizon 2020 programme combines the former funding programmes for R&I - 7th EU Framework Programme for Research, European Institute of Innovation and Technology (EIT), innovation parts of Competitiveness and Innovation Programme (CIP):

- Focuses more on innovation: closing the gap between knowledge and market, stronger participation of SMEs.
- Promotes solutions for societal challenges with visible socio-economic impact
- It is simplified (single set of simplified rules, reducing time-to-grant, single IT Participant Portal).

The three main pillars of the programme are:

I. Excellent Science

II. Industrial Leadership

III. Societal Challenges

- Spreading Excellence and Widening Participation
- Science with and for Society

Other actions are:

- European Institute of Innovation and Technology (EIT)
- Joint Research Centres (JRC)
- EURATOM

The main elements in Pillar I – Excellent science are:

• **European Research Council (ERC):** support the most talented and creative individuals and their teams to carry out frontier research

• **Future and Emerging Technologies (FET):** fund collaborative research to open up new and promising fields of research and innovation

• **Marie Skłodowska-Curie Actions:** provide mobility of researchers; focus on training and career development:

- **Initial Training Networks (ITN)**
  - Doctoral and initial training of researchers proposed by international networks of organisations from public and private sectors
  - European TN, Industrial Doctorates, Joint Doctorates
- **Individual Fellowships (IF)**
  - Individual fellowships for most promising experienced researchers to develop their skills through international or inter-sector mobility
  - European Fellowship, Re-Integration, Global Fellowships (Return Phase)
- **Research and Innovation Staff Exchange (RISE)**
  - International and inter-sector cooperation through the exchange of research and innovation staff (include administrative, managerial and technical staff)
- **COFUND**

- Co-funding of regional, national and international programmes covering the above described actions

• **Research infrastructures (**EU definition „Facilities, resources and related services used by the scientific community to conduct top-level research in their respective fields. RI can be single-sited or distributed"):

- Ensure Europe has world-class research infrastructures (including e-infrastructures) accessible to all researchers in Europe and beyond:
- First call for existing but also new RIs, focus on integration (networking, transnational access or service activities, joint research)
- Focus on human capital (training) as a mandate for RIs; innovation potential of RIs (cooperation with SMEs, PPP)

The main elements of Pillar III – Societal Challenges are:

1. Health, Demographic Change and Wellbeing
2. Food Security, Sustainable Agriculture and Forestry, Marine and Maritime and Inland Water Research and the Bioeconomy
3. Secure, Clean and Efficient Energy
4. Smart, Green and Integrated Transport
5. *Climate action, Environment, Resource Efficiency and Raw Materials*

- Call – Water Innovation: Boosting its value for Europe
- WATER-1-2014/2015: Bridging the gap: from innovative water solutions to market replication
- WATER-2-2014/2015: Integrated approaches to water and climate change
- WATER-3-2014/2015: Stepping up EU research and innovation cooperation in the water area (ERA NET COFUND - Water JPI)
- WATER-4-2014/2015: Harnessing EU water research and innovation results for industry, agriculture, policy makers and citizens
- WATER-5-2014/2015: Strengthening international R&I cooperation in the field of water

6. Europe In A Changing World – Inclusive, Innovative And Reflective Societies
7. Secure Societies – Protecting Freedom and Security Of Europe And Its Citizens

A very important issue is **Spreading Excellence and Widening Participation** which refers to:

• A new set of measures introduced in Horizon 2020 under this separate specific objective (WIDESPREAD), aiming to close the R&I divide between Member States and regions

- A number of countries are experiencing low participation in the EU Framework Programmes (compared to FP7)
- H2020 legal text >>" low RDI performing" Member States for Widening actions (Latvia, Croatia, Lithuania, Malta, Slovakia, Romania, Luxembourg, Poland, Bulgaria, Estonia, Portugal, Slovenia, Cyprus, Czech Republic and Hungary).

IMPLEMENTATION:

• Foster synergies with the European Structural and Investment Funds (ESIF). Measures to be implemented by the Member States most in need of the new Cohesion policy for the 2014-2020 programming period

Widening participation can be achieved by:

TEAMING - CSA (100%): 1 year (1st phase) + 5-7 years (2nd phase)

- Creation of new (or significant upgrade of existing) Centres of Excellence in low performing Member States and regions
- Proposals: Need to demonstrate the long-term science and innovation strategy of the future Centre based on a SWOT analysis
  - Stage 1: Funding for the development of a Business Plan for the new Centre of Excellence facilitated by a teaming process with a leading counterpart in Europe

- Stage 2: Subject to the quality of the Business Plan, and a commitment of the Member State (e.g. support via Cohesion Policy Funds), the Commission may provide further substantial financial support for the first steps of implementation of the Centre.

In each Teaming project there is:

- (1) the participant organisation (COORDINATOR) from a low performing Member State (for example a research agency at national or regional level, or a regional authority);
- (2) an institution of research and innovation excellence (public or private) or a consortium of such institutions;

TWINNING:

- Strengthening a defined field of research of a knowledge institution in a low performing Member State or region through linking with at least two internationally-leading counterparts in Europe.
- Proposals: Will have to outline the scientific strategy for stepping up and stimulating scientific excellence and innovation capacity in a defined area of research as well as the scientific quality of the partners involved in the twinning exercise
- Funding for:
  - expert visits and short-term on-site or virtual training;
  - workshops & conference attendance;
  - organisation of joint summer school type activities;
  - dissemination and outreach activities.
  - Equipment & researchers' salaries will NOT be funded.

In each Twinning project there is:

- ONE institution located in a Low Performing MS/region (COORDINATOR)
- A minimum of TWO additional partners from two different Member States or Associated Countries.

Another important issue in Pillar III is ***Science with and for society*** which has as main objective to:

– to build effective cooperation between science and society,

– to recruit new talent for science,

– to pair scientific excellence with social awareness and responsibility.

The rationale is to:

– Increase of quality, relevance and acceptance of European research through interaction with society

– Deals with needs and concerns of society, gender equality, attraction of young people and the general public to science.

Topics include education, citizen participation in R&I, research outreach, framework conditions for responsible R&I, incl. ethics.

The main instruments are represented by coordination and support actions, collaborative projects.

3. Introduction to FP7 DANCERS project

Dr. Adrian Stanica made a brief introduction to the FP7 Project DANCERS – DANube macroregion: Capacity building and Excellence in River Systems (basin, delta and sea).

The main aim of the project is to develop new instruments and tools that will enhance environmental research and promote innovation in Danube Region, including the Danube Delta and the Black Sea. Importantly, the new instruments and tools do not start *ab initio* but will build on existing projects and expertise.

The specific objectives are to:

- critically analyse the achievements in integrated river- delta –sea management in the Danube Region.
- understand links between the achievements, deliverables and results of the work performed.
- define a set of instruments to enhance environmental research and innovation in Danube Region.

The Consortium comprises partners from:

* Danube Region – Germany (1), Austria (3), Hungary (1), Serbia (1), Romania (2)
* EU15 – France (1), Greece (1), Ireland (1), Italy (1), Spain (1), UK (1 sub-consortium of 4 universities)
* UNESCO – IHE

The project is structured in the three pillars of knowledge:

* science,
* research infrastructures
* human potential

There are three categories of stakeholders present in the Danube Region:

* scientists and academia,
* decision and policy makers
* business community.

The project will receive input from the stakeholders and aims to develop instruments that contain:

1. Strategic research agenda,
2. Concept and detailed plan of the distributed research infrastructures for the Danube – Black Sea Macrosystem
3. Proposals for an integrated educational program with the full cooperation of partners from Danube - Black Sea Macrosystem.

Two comments followed:

* Address the EC to obtain continuity in funding research initiatives, as lack of continuity is a major issue here. This requires the need to develop a dedicated programme to the Danube Region specific needs.
* The partners in the Consortium should participate more in JPI Oceans and to link with DANUBIUS – RI project explain that it is not dedicated to the Danube Delta and Romania but to river – delta – sea systems in general.

4. Presentation of the DANCERS Data Base of Projects, Programmes and Initiatives in the management of river-delta-sea in the Danube Region

Dr. Mihaela Paun, from the Romanian National Institute for Biological Sciences presented the data base of the project, hosted by the University of Natural Resources and Life Sciences, BOKU, Vienna.

The data base gathers all existing information about projects and their results in the Danube Region with focus on water and environmental management issues:

- of the last two decades,
- at all geographic levels (national, regional, European, International),
- closely linked to the three main domains: life sciences (including environmental aspects), earth sciences and socio-economics,
- structured into the three main pillars: Scientific Agenda, R&D Infrastructure and Human Capital and
- based on the Danube River Basin Management Plan (ICPDR 2009),

The metadatabase stays open for further entries and remains active even after the project ends, in 2015.

DANCERS metadatabase serves as basis for further studies, for identifing of strengths and weaknesses, links and gaps in water management issues in the Danube Region. Its main purposes are to:

- provide structured information for the assessment of the collected projects,
- improve access to the gathered data and
- promote the sharing of obtained knowledge.

Metadata:

- is “data about data” or “information about data”
- provide a short summary about the content, purpose, quality, location of the data as well as information related to its creation

The hardware – features:

- standard server configuration with state of the art components
- have sufficient storage space and high security of the data is guaranteed
- all necessary security updates and software updates are provided during the project lifetime
- accessibility of the server is guaranteed at least for one year after project end.

For each project, the metadatabase contains:

* Title
* Date
* Abstract
* Key words

For data collection two methods were used:

a. Questionnaire

b. Internet Search

The situation of record in the data base is as follows:

Records in DANCERS metadatabase	No of projects
Status: 12.3.2014	**476**
Composition:	
returned questionnaires (deadline 6.2.2014):	256
direct entries into metadatabase	251
Deleted:	
duplicates/multiples/not of interest	31
Geographic location	
Upper Danube	203
Middle Danube	143
Lower Danube	165
Danube delta	136
Danube coastal zone	48
Western Black Sea	116
Core category	
Scientific Agenda	279
Research Infrastructure	48
Human Capital	51
Thematic Area	
Life Sciences	145
Earth Sciences	126
Socio-Economics	95
Multidisciplinary	189
Funding Type	
EC - DG R&I	96
EC-Other	48
Structural Funds (ERDF, IPA, Cohesion)	37
National R&D	138
National Other (environmental monitoring, maintenance of navigation)	46
International (UN and other)	39
Other	67
Programme Type	
Environmental monitoring and measurements	170
Maintenance of navigation	37
Other	77
Research - Human Resources&Education	14

Research - scientific ideas and scientific cooperation	52
Research - development and upgrading of research infrastructure	162
Status of the project	
Completed	372
Ongoing	100

Dr. Paun continued with the presentation of data analysis, made by her team.
Data analysis consisted in:
1. Checking the consistency of all data gathered, deleting duplicates – INSB and GeoEcoMar
2. Implementing the changes in the database - WCL
3. Data Analysis – INSB

The analysis was performed on the data file sent by WCL on February 26th 2014 and the dataset consists of 472 projects from which:

- 468 recorded answers regarding the status of the project
- 4 projects having missing values.
- Out of the 468 recorded answers
    - 370 have been completed
    - 98 ongoing
- 463 projects have recorded answers
- 9 missing values.

There are 26 coordinating countries for the 472 projects entered. The analysis of the projects took into consideration the following criteria: status (completed/ongoing), coordinating country, thematic areas (life, earth, socio, multi), programme type, funding type, year (no per year).
Some of the results are presented in the following figures:

Country	No. of coordinated projects	Percentage of coordinated projects among recorded projects
Austria	140	30.23%
Belgium	7	1.50%
Bulgaria	16	2.60%
Croatia	2	0.40%
Denmark	1	0.20%
Finland	2	0.40%
France	9	1.90%
Germany	23	5%
Greece	9	1.9%
Hungary	12	2.6%
International	1	2%
Italy	11	2.4%
Netherlands	16	3.5%
Norway	2	0.4%
Portugal	1	0.2%
Romania	137	29.60%
Serbia	16	3.50%
Slovakia	4	0.90%
Slovenia	5	1.10%
Spain	5	1.10%
Sweden	1	0.20%
Switzerland	17	3.70%
Turkey	1	0.20%
UK	9	2.60%
Ukraine	3	0.60%
USA	10	2.20%
Total	**463**	**100%**

Country	Ongoing (1)	Completed (2)
Austria	34	104
Belgium	0	7
Bulgaria	4	12
Croatia	0	2
Denmark	0	1
Finland	0	2
France	2	7
Germany	3	20
Greece	2	7
Hungary	4	7
International	0	1
Italy	5	6
Netherlands	5	11
Norway	1	1
Portugal	1	0
Romania	13	124
Serbia	4	12
Slovakia	1	3
Slovenia	1	4
Spain	4	1
Sweden	0	1
Switzerland	4	13
Turkey	0	1
UK	2	10
Ukraine	3	0
USA	3	7
Total	**96**	**364**

At the end, some conclusions were formulated:

1. Database represents a major contribution to the scientific community and is active, new information is still added – 4 observations in the last two weeks;
2. There is a significant larger number of projects entered from Austria, Romania, Germany and Switzerland;

Are there no other projects than the ones entered for the other countries? Or should efforts be made to have the remaining projects entered for these countries?

3. After the National funding type, the second major funding type is EC DG R&I;

4. Largest number of projects funded in Life Sciences, followed by Earth Sciences; Life Sciences and Earth Sciences are depended choices for funded projects;

5. From 1976 to 1994 there is no identifiable trend – either due to lack of funding or lack of information now about the projects funded during that time.

6. An increasing trend in funding from 1994 to an all time high in 2009, with a drop in the number of funded projects in the next 4 years.

7. Only 21% of the total number of projects that have been identified are still active, hence the new strategies should help improve these numbers;

8. Not enough information about the output of the projects – work in progress.

Following the presentation some comments were made:

C1: The merit of the project is that its database represents a step forward in terms of information in the Danube Region.

C2: The terminology of the questionnaire is not the best, to encourage people to participate, use: ex. 'Upload your project'.

C3: Make clean pies for the projects that interconnect for the projects that don't.

5. Opportunities for European Cooperation within Horizon 2020 – Societal Challenge 5 on Integrated Management of River- Delta – Sea Systems (Life Sciences, Earth Sciences, Environmental Sciences, Water Cycle)

Dr. Adrian Stanica delivered the presentation on behalf of Christos Fragakis, DG Research and Innovation, who could not be present.

In the Pillar III (Societal challenges) of Horizon 2020, "Climate action, environment, resource efficiency and raw materials" is an important chapter. Related to this, the main objective is to achieve a resource – and water – efficient and climate change resilient economy and society, the protection and sustainable management of natural resources and ecosystems, and a sustainable supply and use of raw materials, in order to meet the needs of a growing global population within the sustainable limits of the planet's natural resources and eco-systems.

The broad lines of activities are:

- Fighting and adapting to climate change
- Sustainably managing natural resources and ecosystems
- Sustainable supply of non-energy and non-agricultural raw materials
- Transition towards a green economy through eco-innovation
- Global environmental observation and information systems
- Cultural heritage

In the Work Programme 2014/2015 twelve focus areas were identified, of which five linked to 'Climate action, environment, resource efficiency and raw materials:

- Waste: A resource to recycle, reuse and recover raw materials
- Water innovation: Boosting its value for Europe
- Energy-efficiency
- Disaster-resilience: Safeguarding society and adapting to climate change
- Blue growth: Unlocking the potential of the oceans

Regarding Water innovation, boosting its value for Europe - areas covered 2014/2015, the main objectives are:

- Bridging the gap: from innovative water solutions to market replication
- Integrated approaches to water and climate change
- Stepping up EU research and innovation cooperation in the water area
- Harnessing EU water research and innovation results for industry, policy makers and citizens
- Strengthening international R&I cooperation in the field of water

For bridging the gap, from innovative water solutions to market replication, the main activities are:

- Accelerate commercialisation of eco-innovative water solutions (technologies, process, products, services, etc.)
- Stimulate sustainable economic growth, business and job creation in the water sector

Proposals should:

- Support first application and market replication of near-market water solutions
- Address the 5 thematic priorities identified in the SIP (strategic implementation plan) of the EIP (European Innovation Partnership) on Water
- Address issues affecting rapid uptake and market deployment of innovative solutions
- Include participation of SMEs

Appropriate EU contribution: EUR 2-4 million. Type of action: Innovation actions

The topic is relevant also for process industries (SPIRE PPP) and advanced ICT solutions (data interoperability and harmonization with INSPIRE).

For Integrated approaches to water and climate change, the specific challenge is:

- Improved understanding of the impacts of climate change on the hydrological cycle for better informed decision making and sustainable management of water systems in EU, ensuring both adequate quantity and quality (Blueprint)

Proposals should:

- Maximise reliability of projections of precipitation at various spatial and time scales;
- Improve the short-to-medium term forecasting of related extreme events;
- Assess the impacts of weather extremes and climate change on water cycle in terms of quantity and quality;
- Develop risk management strategies and adaptation options at the appropriate scales, involving all relevant stakeholders;

Appropriate EU contribution: EUR 6-8 million. Type of action: Research and innovation actions.

For stepping up EU research and innovation cooperation in the water area, the specific challenge is:

- Support to JPI on water to implement its common vision and Strategic Research Agenda (SRA) to reduce fragmentation of nationally funded water-related R & I activities and enhance synergy, co-ordination and coherence between national and EU funding

Proposals should:

- Pool resources from national/regional research programmes to implement a joint call with EU co-funding
- Support the priorities identified in the SRA of the Water JPI related to the development of technological solutions and services for water distribution and measurement, waste water treatment and reuse, desalination, floods and droughts, etc.

Type of action: ERA-NET Cofund

In harnessing EU water research and innovation results for industry, agriculture, policy makers and citizens, the specific challenge is:

- Ensure more effective use and exploitation of research results and good water management practices to enhance decision making in the field of water

Proposals should address one of:

- Promote dissemination and exploitation of EU funder activities, including relevant ICT-based tools and platforms and foster knowledge sharing and continuous benchmarking and awareness across EU and Associated Countries, including the WFD network of River Basin Districts, and/or
- Identify research gaps taking stock of existing knowledge, research activities and the implementation needs of WFD, and/or
- Promote water-related innovation and business development, cluster eco-innovative companies, develop innovative financial instruments; and/or
- Develop a coordinated approach to the integration of the water and waste sectors in the EIP "Smart Cities and Communities", identifying research and innovation needs which could lead to future actions

Appropriate EU contribution: EUR 1 million. Type of action: Coordination and support action

For strengthening international R&I cooperation in the field of water, the specific challenge is:

- Strengthen international cooperation in the field of water with emerging economies, especially China and India
- Promote market opportunities for innovative water solutions outside Europe and share experiences in water policy and river management
- Promote EU leadership in international water-related negotiations

Proposals should:

- Help creating strategic cooperation partnerships for water research and innovation and shared R & I agendas and roadmaps
- Priority will be given to proposals contributing to implementation of on-going international activities and partnerships where EU Member States are jointly committed to providing a more coherent approach (SFIC) to R&I e.g.
    - EU/Member States –India research and innovation partnership in water

- China-Europe Water Platform

Type of action: Coordination and Support Action. Appropriate EU contribution: EUR 1 million.

Smart Specialisation Strategies should :

- ✓ Concentrate resources on a limited and selected number of R&I priorities
- ✓ Priorities are to reinforce the regions' strengths, in line with the national reform programme (NRP)
- ✓ The agreement on the Strategy is an ex-ante condition for the allocation of support from the Structural funds
- ✓ Commission assists regions to develop their strategies: Smart Specialisation Platform

6. Introduction to the workshop. Methods and programme

Dr. Panagiotis Michalopoulos, from the Hellenic Centre of Marine Research presented briefly the purpose of the workshop. The analysis performed on the projects from the data base were presented critically to the representatives of the science community and discussed critically. The main objectives are:

- To present results to scientists/experts and discuss them critically.
- To help the identification of strengths, weaknesses, opportunities and threats in research and integrated management in the Danube river-Black sea macrosystem .
- To provide input toward:
  - Developing a regional science and innovation agenda in the Danube – Danube Delta – Black Sea.
  - Drafting detailed plans for the development of regional distributed research infrastructures, covering all aspects of environmental sciences.
  - Designing an education program aiming at strengthening the human capital in the field of an innovative integrated management for the Danube – Danube Delta – Black Sea macrosystem.

In order to achieve the objectives, the approach is to use group discussions with the aid of Questionnaires to help identify:

- Thematic priorities for a research agenda
- Best future approaches to education in the fields of ecosystem research and management for the Danube – Danube Delta – Black Sea macrosystem.
- Areas of activity, and potential contribution of a distributed research infrastructure to the advancement of research, education, planning in the Danube – Danube Delta – Black Sea macrosystem.

The participants were asked to fill in a 'Thematic Priorities Questionnaire'.

The questionnaire has three main sections:

a) Thematic Priorities related to Horizon 2020 Societal Challenges

b) Thematic Priorities related to the Danube Ecosystem as a whole and its services.

c) Thematic Priorities Related to Water Issues in the Danube Region.

Participants were asked to fill in an 'Educational Priorities Questionnaire'.

Participants were asked to fill in a 'Research Infrastructure Priorities Questionnaire'.

The group discussions for each of the questionnaire continued the next day – 18.03.2014.

Several comments were made related to the Thematic Priorities Questionnaire' (final results to be presented in Phase 3):

C1: Identify and assess the degree of connectivity between present and past and see how it can affect the future

C2: In the energy (hydro power) field, there is a lack in communication between the administration of transport and administration of hydro power and it is important for dams and flood issues
C3: The regulation of hydrological regime in the Danube Region is a political issue, as each country has its own sets of rules and regulations

Several comments were made related to the 'Education Agenda Questionnaire' (the final form of the questionnaire will be circulated separately, at the end of Phase 3):
C1: How to identify a market for students? Make Danube Region a place of excellence in some specific fields, so students will come to study those specific aspects (create solutions)
C2: Danube Region - make it a EU brand
C3: Talking to employers (industry, government, management, administration) to identify the needs in relation to graduate students (ask Deltares and Ifremer and others, learn from their experience)

Several comments were made related to the 'Research Infrastructures' (the final form of the questionnaire will be circulated separately at the end of Phase 3):
C1: Existing infrastructure needs to be upgraded and the collaboration must be enhanced
C2: Unique point in the Danube Region – it raises major social and political and we need to know how to respond in terms of science
C3: Related to data:

- The existing databases should connect to Copernicus and GEOSS
- Create metadata for the existing data
- Prepare the existing 'historical' data and make it digital

Close agreements between Danube countries to collect, collate and share data in the region
C4: Empower society in science – framework for citizen science
C5: Safe navigation is not possible from the navigation point of view (ex. Hungary), find allowed solutions (see scenarios).

The meeting ended on Tuesday, 18.03.2014.

Annex 1. List of participants:

Name	***Country***	***Organization***
Francesco Marabini franco.marabini@bo.ismar.cnr.it	Italy	ISMAR
Robert Devoy R.Devoy@ucc.ie	Ireland	University College Cork
Jeremy Gault <J.Gault@ucc.ie>	Ireland	University College Cork
Jeanne Gherardi <Jeanne.Gherardi@ifremer.fr>	France	IFREMER
Caterina Dabala <dabala@corila.it>	Italy	CORILA
Vangelis Papathanassiou <vpapath@hcmr.gr>	Grece	Hellenic Centre for Marine Research
Panagiotis Michalopoulos <pmichalo@hcmr.gr>	Grece	Hellenic Centre for Marine Research
Andrew Tyler <a.n.tyler@stir.ac.uk>	United Kingdom	University of Sterling
Chris Bradley <c.bradley@bham.ac.uk>	United Kingdom	University of Birmingham

Georg Umgiesser georg.umgiesser@ismar.cnr.it	Italy	ISMAR
Martin Felix Gajdusek <gajdusek@zsi.at>	Austria	ZSI Vienna
Gilles Lericolais <gilles.lericolais@ifremer.fr>	France	IFREMER
Gretchen Gettel <G.Gettel@unesco-ihe.org>	Olanda	UNESCO - IHE
Davide Vignati david-anselmo.vignati@univ-lorraine.fr	Franta	Universite` de Lorraine, Metz
Janusz Dominik Janusz.Dominik@unige.ch	Switzerland	University of Geneva
Antony Brown Tony.Brown@soton.ac.uk	United Kingdom	Southampton National Oceanographic Centre
Nicolai Berlinski nberlinsky@ukr.net	Ukraine	State Ecological University of Odessa
Bulla Miklos <miklosbulla@t-online.hu>, <miklos.bulla@vm.gov.hu>	Hungary	Szechenyi Istvan University of Gyor
Vincente Gracia Vicenc.gracia@upc.edu	Spain	Centre for Research in Coastal Environment, Politechnic University of Barcelona
Ivana Ivancev Tumbas ivana.ivancev-tumbas@dh.uns.ac.rs	Serbia	University of Novi Sad
Margarita Stancheva stancheva@io-bas.bg	Bulgaria	Institute of Oceanology – Bulgarian Academy of Sciences
Hristo Stanchev stanchev@io-bas.bg	Bulgaria	Institute of Oceanology – Bulgarian Academy of Sciences
Elena Botezatu elena.botezatu@geaconsulting.ro	Romania	GEA Consulting
Virgil Dinulescu virgil.dinulescu@fmmc.ro	Romania	FMMC
Madalin Ionita madalin.ionita@fmmc.ro	Romania	FMMC
Viorel Gh. Ungureanu gigi_ungureanu@yahoo.com viorel.ungureanu@marine-research.ro	Romania	Marine Research Ltd.
Vlad Lazar	Romania	Marine Research Ltd.
Iulian Nichersu iuli@indd.tim.ro	Romania	Danube Delta National Institute
Manuela Sidoroff <manuelasidoroff@yahoo.com>	Romania	INSB
Simona Litescu <slitescu@gmail.com>	Romania	INSB
Mihaela Paun <mihaela.paun@gmail.com>	Romania	INSB
Andrei Paun	Romania	INSB

<andreipaun@gmail.com>		
Gheorghe Oaie goaie@geoecomar.ro	Romania	GeoEcoMar
Nicolae Panin panin@geoeocomar.ro	Romania	GeoEcoMar / Romanian Academy
Adriana Constantinescu adriana.c@geoecomar.ro	Romania	GeoEcoMar
Cristian Cudalbu c.cudalbu@geoecomar.ro	Romania	GeoEcoMar
Madalina Nailia madalina@geoecomar.ro	Romania	GeoEcoMar
Adrian Stanica astanica@geoecomar.ro	Romania	GeoEcoMar
Alexandra Vancea	Romania	MEN
Viorel Vulturescu	Romania	MEN

Annex2. Agenda of the meeting

17 / 18 March 2014

Venue: ***HOTEL HOWARD JOHNSON –*** *Calea Dorobantilor nr. 5-7, Sector 1****, Bucharest***

Monday 17 March 2014

14.00 -14.20 **Welcome addresses**
Gheorghe Oaie, General Director of GeoEcoMar
Viorel Vulturescu, Director, Programs for European and International RDI Priorities Directorate, Ministry of National Education

Introduction of participants. Tour de table

14.20 -14.45 **New Research and Innovation oportunities provided by the Horizon 2020 Programme in the Danube Region**

Viorel Vulturescu, Director for European Integration and International Cooperation – Ministry of National Education – Activity of Research and Innovation

14.45 -15.00 **Introduction to FP 7 DANCERS Project**

Adrian Stănică – project coordinator (RO)

15.00 – 15.30 **Presentation of the DANCERS Data Base of Projects, Programmes and Initiatives in the management of river-delta-sea in the Danube Region (D2.1.)**

Mihaela Paun, NISB

15.30 -16.00 **Coffee break**

16.00 – 16.30 **Opportunities for European Cooperation within Horizon 2020 – Societal Challenge 5 on Integrated Management of River- Delta – Sea Systems (Life Sciences, Earth Sciences, Environmental Sciences, Water Cycle)**

Adrian Stanica, project coordinator on behalf of Christos Fragakis, EC Officer, DG Research and Innovation (tbc)

16.30 – 16.45 Introduction **to the workshop. Methods and programme**

Panagiotis Michalopoulos, HCMR

16.45 – 18.00 **Group discussion of state of research in the Danube Region**

Participants will be asked to analyze:

What is strong

What appears to be missing

What should be strenghtened

By taking into account: domain / geographic distribution / field of interest

19.00 – 21.30 **Working dinner.**

Tuesday 18 March 2014

09.30 – 09.40 **Welcome and agenda of the day**

*Adrian Stanica,*GeoEcoMar

09.40 – 10.30 **Group discussion of state of research in the Danube Region (continuation from Day 1)**

10.30 – 11.00 Coffee break

11.00 - 12.00 **New ideas for the development of a successful research and innovation agenda in the Danube – Black Sea Region**

Group discussions

12.00 – 13.00 **New ideas for the development of new and successful education plans in the field of water management and research in the Danube – Black Sea Region**

Group discussions

13.00 – 14.30 **Working lunch**

14.30 - 15.30 **New ideas for the development of new distributed Research Infrastructure in the field of water management and research in the Danube – Black Sea Region**

Group discussions

15.30 - 17.00 **Outcomes and wrap-up of the Workshop**

All partners

7.3. Seminar International „Cresterea colaborarii dintre comunitatea stiintifica si mediul de afaceri din Regiunea Dunarii. Noi oportunitati" 19-20.03.2014

7.3.1. Anexa 4 – Minuta intalnirii

International Seminar „Increasing the collaboration between the scientific community and the business environment in the Danube Region. New opportunities"

1. Welcome and introductions

The meeting started with a short welcoming address from Dr. Adrian Stanica, Scientific Director of the Romanian Nation Institute for Marine Geology and Geoecology.

Formal around the table introductions followed, then discussions started.

2. New Research and Innovation opportunities provided by the Horizon 2020 Programme in the Danube Region

Mrs. Alexandra Vancea, NCP for Marie Curie actions in the Romanian Ministry of National Education presented the main opportunities provided by the Horizon 2020 programme in the Danube Region.
Horizon 2020 programme combines the former funding programmes for R&I - 7th EU Framework Programme for Research, European Institute of Innovation and Technology (EIT), innovation parts of Competitiveness and Innovation Programme (CIP):

- Focuses more on innovation: closing the gap between knowledge and market, stronger participation of SMEs.
- Promotes solutions for societal challenges with visible socio-economic impact
- It is simplified (single set of simplified rules, reducing time-to-grant, single IT Participant Portal).

The three main pillars of the programme are:
I. Excellent Science
II. Industrial Leadership
III. Societal Challenges

- Spreading Excellence and Widening Participation
- Science with and for Society

Other actions are:

- European Institute of Innovation and Technology (EIT)
- Joint Research Centres (JRC)
- EURATOM

The main elements in Pillar I – Excellent science are:
• **European Research Council (ERC):** support the most talented and creative individuals and their teams to carry out frontier research
• **Future and Emerging Technologies (FET):** fund collaborative research to open up new and promising fields of research and innovation
• **Marie Skłodowska-Curie Actions:** provide mobility of researchers; focus on training and career development:

- **Initial Training Networks (ITN)**
  - Doctoral and initial training of researchers proposed by international networks of organisations from public and private sectors
  - European TN, Industrial Doctorates, Joint Doctorates

- **Individual Fellowships (IF)**
    - Individual fellowships for most promising experienced researchers to develop their skills through international or inter-sector mobility
    - European Fellowship, Re-Integration, Global Fellowships (Return Phase)
- **Research and Innovation Staff Exchange (RISE)**
    - International and inter-sector cooperation through the exchange of research and innovation staff (include administrative, managerial and technical staff)
- **COFUND**
    - Co-funding of regional, national and international programmes covering the above described actions

• **Research infrastructures (**EU definition „Facilities, resources and related services used by the scientific community to conduct top-level research in their respective fields. RI can be single-sited or distributed"):

- Ensure Europe has world-class research infrastructures (including e-infrastructures) accessible to all researchers in Europe and beyond:
- First call for existing but also new RIs, focus on integration (networking, transnational access or service activities, joint research)
- Focus on human capital (training) as a mandate for RIs; innovation potential of RIs (cooperation with SMEs, PPP)

The main elements of Pillar III – Societal Challenges are:

1. Health, Demographic Change and Wellbeing
2. Food Security, Sustainable Agriculture and Forestry, Marine and Maritime and Inland Water Research and the Bioeconomy
3. Secure, Clean and Efficient Energy
4. Smart, Green and Integrated Transport

5. Climate action, Environment, Resource Efficiency and Raw Materials

- Call – Water Innovation: Boosting its value for Europe
- WATER-1-2014/2015: Bridging the gap: from innovative water solutions to market replication
- WATER-2-2014/2015: Integrated approaches to water and climate change
- WATER-3-2014/2015: Stepping up EU research and innovation cooperation in the water area (ERA NET COFUND - Water JPI)
- WATER-4-2014/2015: Harnessing EU water research and innovation results for industry, agriculture, policy makers and citizens
- WATER-5-2014/2015: Strengthening international R&I cooperation in the field of water

6. Europe In A Changing World – Inclusive, Innovative And Reflective Societies
7. Secure Societies – Protecting Freedom and Security Of Europe And Its Citizens

A very important issue is **Spreading Excellence and Widening Participation** which refers to:

• A new set of measures introduced in Horizon 2020 under this separate specific objective (WIDESPREAD), aiming to close the R&I divide between Member States and regions

- A number of countries are experiencing low participation in the EU Framework Programmes (compared to FP7)
- H2020 legal text >>" low RDI performing" Member States for Widening actions (Latvia, Croatia, Lithuania, Malta, Slovakia, Romania, Luxembourg, Poland, Bulgaria, Estonia, Portugal, Slovenia, Cyprus, Czech Republic and Hungary).

IMPLEMENTATION:

• Foster synergies with the European Structural and Investment Funds (ESIF). Measures to be implemented by the Member States most in need of the new Cohesion policy for the 2014-2020 programming period

Widening participation can be achieved by:

TEAMING - CSA (100%): 1 year (1st phase) + 5-7 years (2nd phase)

- Creation of new (or significant upgrade of existing) Centres of Excellence in low performing Member States and regions
- Proposals: Need to demonstrate the long-term science and innovation strategy of the future Centre based on a SWOT analysis
  - Stage 1: Funding for the development of a Business Plan for the new Centre of Excellence facilitated by a teaming process with a leading counterpart in Europe
  - Stage 2: Subject to the quality of the Business Plan, and a commitment of the Member State (e.g. support via Cohesion Policy Funds), the Commission may provide further substantial financial support for the first steps of implementation of the Centre.

In each Teaming project there is:

- (1) the participant organisation (COORDINATOR) from a low performing Member State (for example a research agency at national or regional level, or a regional authority);
- (2) an institution of research and innovation excellence (public or private) or a consortium of such institutions;

TWINNING:

- Strengthening a defined field of research of a knowledge institution in a low performing Member State or region through linking with at least two internationally-leading counterparts in Europe.
- Proposals: Will have to outline the scientific strategy for stepping up and stimulating scientific excellence and innovation capacity in a defined area of research as well as the scientific quality of the partners involved in the twinning exercise
- Funding for:
  - expert visits and short-term on-site or virtual training;
  - workshops & conference attendance;
  - organisation of joint summer school type activities;
  - dissemination and outreach activities.
  - Equipment & researchers' salaries will NOT be funded.

In each Twinning project there is:

- ONE institution located in a Low Performing MS/region (COORDINATOR)
- A minimum of TWO additional partners from two different Member States or Associated Countries.

Another important issue in Pillar III is ***Science with and for society*** which has as main objective to:

– to build effective cooperation between science and society,

– to recruit new talent for science,

– to pair scientific excellence with social awareness and responsibility.

The rationale is to:

– Increase of quality, relevance and acceptance of European research through interaction with society

– Deals with needs and concerns of society, gender equality, attraction of young people and the general public to science.

Topics include education, citizen participation in R&I, research outreach, framework conditions for responsible R&I, incl. ethics.

The main instruments are represented by coordination and support actions, collaborative projects.

3. Presentation of FP7 DANCERS project

Dr. Adrian Stanica made a brief introduction to the FP7 Project DANCERS – DANube macroregion: Capacity building and Excellence in River Systems (basin, delta and sea).

The main aim of the project is to develop new instruments and tools that will enhance environmental research and promote innovation in Danube Region, including the Danube Delta and the Black Sea.

Importantly, the new instruments and tools do not start *ab initio* but will build on existing projects and expertise.

The specific objectives are to:

- critically analyse the achievements in integrated river- delta –sea management in the Danube Region.
- understand links between the achievements, deliverables and results of the work performed.
- define a set of instruments to enhance environmental research and innovation in Danube Region.

The Consortium comprises partners from:

- Danube Region – Germany (1), Austria (3), Hungary (1), Serbia (1), Romania (2)
- EU15 – France (1), Greece (1), Ireland (1), Italy (1), Spain (1), UK (1 sub-consortium of 4 universities)
- UNESCO – IHE

The project is structured in the three pillars of knowledge:

- science,
- research infrastructures
- human potential

There are three categories of stakeholders present in the Danube Region:

- scientists and academia,
- decision and policy makers
- business community.

The project will receive input from the stakeholders and aims to develop instruments that contain:

- Strategic research agenda,
- Concept and detailed plan of the distributed research infrastructures for the Danube – Black Sea Macrosystem
- Proposals for an integrated educational program with the full cooperation of partners from Danube - Black Sea Macrosystem.

Dr. Stanica then presented DANUBIUS – RI as a future ESFRI pan – European infrastructure.

4. Opportunities for European Cooperation within Horizon 2020 – Societal Challenge 5 on Integrated Management of River- Delta – Sea Systems (Life Sciences, Earth Sciences, Environmental Sciences, Water Cycle)

Dr. Adrian Stanica delivered the presentation on behalf of Christos Fragakis, DG Research and Innovation, who could not be present.

In the Pillar III (Societal challenges) of Horizon 2020, "Climate action, environment, resource efficiency and raw materials" is an important chapter. Related to this, the main objective is to achieve a resource – and water – efficient and climate change resilient economy and society, the protection and sustainable management of natural resources and ecosystems, and a sustainable supply and use of raw materials, in order to meet the needs of a growing global population within the sustainable limits of the planet's natural resources and eco-systems.

The broad lines of activities are:

- Fighting and adapting to climate change
- Sustainably managing natural resources and ecosystems
- Sustainable supply of non-energy and non-agricultural raw materials
- Transition towards a green economy through eco-innovation
- Global environmental observation and information systems
- Cultural heritage

In the Work Programme 2014/2015 twelve focus areas were identified, of which five linked to 'Climate action, environment, resource efficiency and raw materials:

- Waste: A resource to recycle, reuse and recover raw materials
- Water innovation: Boosting its value for Europe
- Energy-efficiency
- Disaster-resilience: Safeguarding society and adapting to climate change
- Blue growth: Unlocking the potential of the oceans

Regarding Water innovation, boosting its value for Europe - areas covered 2014/2015, the main objectives are:

- Bridging the gap: from innovative water solutions to market replication
- Integrated approaches to water and climate change
- Stepping up EU research and innovation cooperation in the water area
- Harnessing EU water research and innovation results for industry, policy makers and citizens
- Strengthening international R&I cooperation in the field of water

For bridging the gap, from innovative water solutions to market replication, the main activities are:

- Accelerate commercialisation of eco-innovative water solutions (technologies, process, products, services, etc.)
- Stimulate sustainable economic growth, business and job creation in the water sector

Proposals should:

- Support first application and market replication of near-market water solutions
- Address the 5 thematic priorities identified in the SIP (strategic implementation plan) of the EIP (European Innovation Partnership) on Water
- Address issues affecting rapid uptake and market deployment of innovative solutions
- Include participation of SMEs

Appropriate EU contribution: EUR 2-4 million. Type of action: Innovation actions

The topic is relevant also for process industries (SPIRE PPP) and advanced ICT solutions (data interoperability and harmonisation with INSPIRE).

For Integrated approaches to water and climate change, the specific challenge is:

- Improved understanding of the impacts of climate change on the hydrological cycle for better informed decision making and sustainable management of water systems in EU, ensuring both adequate quantity and quality (Blueprint)

Proposals should:

- Maximise reliability of projections of precipitation at various spatial and time scales;
- Improve the short-to-medium term forecasting of related extreme events;
- Assess the impacts of weather extremes and climate change on water cycle in terms of quantity and quality;
- Develop risk management strategies and adaptation options at the appropriate scales, involving all relevant stakeholders;

Appropriate EU contribution: EUR 6-8 million. Type of action: Research and innovation actions.

For stepping up EU research and innovation cooperation in the water area, the specific challenge is:

- Support to JPI on water to implement its common vision and Strategic Research Agenda (SRA) to reduce fragmentation of nationally funded water-related R & I activities and enhance synergy, co-ordination and coherence between national and EU funding

Proposals should:

- Pool resources from national/regional research programmes to implement a joint call with EU co-funding
- Support the priorities identified in the SRA of the Water JPI related to the development of technological solutions and services for water distribution and measurement, waste water treatment and reuse, desalination, floods and droughts, etc.

Type of action: ERA-NET Cofund

In harnessing EU water research and innovation results for industry, agriculture, policy makers and citizens, the specific challenge is:

- Ensure more effective use and exploitation of research results and good water management practices to enhance decision making in the field of water

Proposals should address one of:

- Promote dissemination and exploitation of EU funder activities, including relevant ICT-based tools and platforms and foster knowledge sharing and continuous benchmarking and awareness across EU and Associated Countries, including the WFD network of River Basin Districts, and/or
- Identify research gaps taking stock of existing knowledge, research activities and the implementation needs of WFD, and/or
- Promote water-related innovation and business development, cluster eco-innovative companies, develop innovative financial instruments; and/or
- Develop a coordinated approach to the integration of the water and waste sectors in the EIP "Smart Cities and Communities", identifying research and innovation needs which could lead to future actions

Appropriate EU contribution: EUR 1 million. Type of action: Coordination and support action

For strengthening international R&I cooperation in the field of water, the specific challenge is:

- Strengthen international cooperation in the field of water with emerging economies, especially China and India
- Promote market opportunities for innovative water solutions outside Europe and share experiences in water policy and river management
- Promote EU leadership in international water-related negotiations

Proposals should:

- Help creating strategic cooperation partnerships for water research and innovation and shared R & I agendas and roadmaps
- Priority will be given to proposals contributing to implementation of on-going international activities and partnerships where EU Member States are jointly committed to providing a more coherent approach (SFIC) to R&I e.g.
    - EU/Member States –India research and innovation partnership in water
    - China-Europe Water Platform

Type of action: Coordination and Support Action. Appropriate EU contribution: EUR 1 million.

Smart Specialisation Strategies should:

- ✓ Concentrate resources on a limited and selected number of R&I priorities
- ✓ Priorities are to reinforce the regions' strengths, in line with the national reform programme (NRP)
- ✓ The agreement on the Strategy is an ex-ante condition for the allocation of support from the Structural funds
- ✓ Commission assists regions to develop their strategies: Smart Specialisation Platform

5. <u>Presentation of the DANCERS Data Base of Projects, Programmes and Initiatives in the management of river-delta-sea in the Danube Region</u>

Dr. Mihaela Paun, from the Romanian National Institute for Biological Sciences presented the data base of the project, hosted by the University of Natural Resources and Life Sciences, BOKU, Vienna.

The data base gathers all existing information about projects and their results in the Danube Region with focus on water and environmental management issues:

- of the last two decades,
- at all geographic levels (national, regional, European, International),

- closely linked to the three main domains: life sciences (including environmental aspects), earth sciences and socio-economics,
- structured into the three main pillars: Scientific Agenda, R&D Infrastructure and Human Capital and
- based on the Danube River Basin Management Plan (ICPDR 2009),

The metadatabase stays open for further entries and remains active even after the project ends, in 2015**.**
DANCERS metadatabase serves as basis for further studies to identify strengths and weaknesses, links and gaps in water management issues in the Danube Region. Its main purposes are to:

- provide structured information for the assessment of the collected projects,
- improve access to the gathered data and
- promote the sharing of obtained knowledge.

Metadata:

- is "data about data" or "information about data"
- provide a short summary about the content, purpose, quality, location of the data as well as information related to its creation

The hardware – features:

- standard server configuration with state of the art components
- have sufficient storage space and high security of the data is guaranteed
- all necessary security updates and software updates are provided during the project lifetime
- accessibility of the server is guaranteed at least for one year after project end.

For each project, the metadatabase contains:

* Title
* Date
* Abstract
* Key words

For data collection two methods were used:

a. Questionnaire

b. Internet Search

The situation of record in the data base is as follows:

Records in DANCERS metadatabase	No of projects
Status: 12.3.2014	**476**
Composition:	
returned questionnaires (deadline 6.2.2014):	256
direct entries into metadatabase	251
Deleted:	
duplicates/multiples/not of interest	31
Geographic location	
Upper Danube	203
Middle Danube	143
Lower Danube	165
Danube delta	136
Danube coastal zone	48
Western Black Sea	116
Core category	
Scientific Agenda	279
Research Infrastructure	48
Human Capital	51

Thematic Area	
Life Sciences	145
Earth Sciences	126
Socio-Economics	95
Multidisciplinary	189
Funding Type	
EC - DG R&I	96
EC-Other	48
Structural Funds (ERDF, IPA, Cohesion)	37
National R&D	138
National Other (environmental monitoring, maintenance of navigation)	46
International (UN and other)	39
Other	67
Programme Type	
Environmental monitoring and measurements	170
Maintenance of navigation	37
Other	77
Research - Human Resources&Education	14
Research - scientific ideas and scientific cooperation	52
Research - development and upgrading of research infrastructure	162
Status of the project	
Completed	372
Ongoing	100

Dr. Paun continued with the presentation of data analysis, made by her team.
Data analysis consisted in:
1. Checking the consistency of all data gathered, deleting duplicates – INSB and GeoEcoMar
2. Implementing the changes in the database - WCL
3. Data Analysis – INSB

The analysis was performed on the data file sent by WCL on February 26th 2014 and the dataset consists of 472 projects from which:

- 468 recorded answers regarding the status of the project
- 4 projects having missing values.
- Out of the 468 recorded answers
    - 370 have been completed
    - 98 ongoing
- 463 projects have recorded answers
- 9 missing values.

There are 26 coordinating countries for the 472 projects entered. The analysis of the projects took into consideration the following criteria: status (completed/ongoing), coordinating country, thematic areas (life, earth, socio, multi), programme type, funding type, year (no per year).
Some of the results are presented in the following figures:

Country	No. of coordinated projects	Percentage of coordinated projects among recorded projects
Austria	140	30.23%
Belgium	7	1.50%
Bulgaria	16	2.60%
Croatia	2	0.40%
Denmark	1	0.20%
Finland	2	0.40%
France	9	1.90%
Germany	23	5%
Greece	9	1.9%
Hungary	12	2.6%
International	1	2%
Italy	11	2.4%
Netherlands	16	3.5%
Norway	2	0.4%
Portugal	1	0.2%
Romania	137	29.60%
Serbia	16	3.50%
Slovakia	4	0.90%
Slovenia	5	1.10%
Spain	5	1.10%
Sweden	1	0.20%
Switzerland	17	3.70%
Turkey	1	0.20%
UK	9	2.60%
Ukraine	3	0.60%
USA	10	2.20%
Total	**463**	**100%**

Country	Ongoing (1)	Completed (2)
Austria	34	104
Belgium	0	7
Bulgaria	4	12
Croatia	0	2
Denmark	0	1
Finland	0	2
France	2	7
Germany	3	20
Greece	2	7
Hungary	4	7
International	0	1
Italy	5	6
Netherlands	5	11
Norway	1	1
Portugal	1	0
Romania	13	124
Serbia	4	12
Slovakia	1	3
Slovenia	1	4
Spain	4	1
Sweden	0	1
Switzerland	4	13
Turkey	0	1
UK	2	10
Ukraine	3	0
USA	3	7
Total	**96**	**364**

At the end, some conclusions were formulated:

3. Database represents a major contribution to the scientific community and is active, new information is still added – 4 observations in the last two weeks;
4. There is a significant larger number of projects entered from Austria, Romania, Germany and Switzerland;

Are there no other projects than the ones entered for the other countries? Or should efforts be made to have the remaining projects entered for these countries?

3. After the National funding type, the second major funding type is EC DG R&I;

4. Largest number of projects funded in Life Sciences, followed by Earth Sciences; Life Sciences and Earth Sciences are depended choices for funded projects;

5. From 1976 to 1994 there is no identifiable trend – either due to lack of funding or lack of information now about the projects funded during that time.

6. An increasing trend in funding from 1994 to an all time high in 2009, with a drop in the number of funded projects in the next 4 years.

7. Only 21% of the total number of projects that have been identified are active, hence the new strategies should help improve these numbers;

8. Not enough information about the output of the projects – work in progress.

Following the presentation some comments were made:

C1: The merit of the project is that its database represents a step forward in terms of information in the Danube Region.

C2: The terminology of the questionnaire is not the best, to encourage people to participate, use: ex. 'Upload your project'.

C3: Make clean pies for the projects that interconnect for the projects that don't.

6. Introduction to the workshop. Methods and programme

Dr. Panagiotis Michalopoulos, from the Hellenic Centre of Marine Research presented briefly the purpose of the workshop. The analysis performed on the projects from the data base were presented critically to the representatives of the business community and discussed critically. The main objectives are:

- To present results to business reprezentatives and discuss them critically.
- To help the identification of strengths, weaknesses, opportunities and threats in research and integrated management in the Danube river-Black sea macrosystem .
- To provide input toward:
    - Developing a regional science and innovation agenda in the Danube – Danube Delta – Black Sea.
    - Drafting detailed plans for the development of regional distributed research infrastructures, covering all aspects of environmental sciences.
    - Designing an education program aiming at strengthening the human capital in the field of an innovative integrated management for the Danube – Danube Delta – Black Sea macrosystem.

In order to achieve the objectives, the approach is to use group discussions with the aid of Questionnaires to help identify:

- Thematic priorities for a research agenda
- Best future approaches to education in the fields of ecosystem research and management for the Danube – Danube Delta – Black Sea macrosystem.
- Areas of activity, and potential contribution of a distributed research infrastracture to the advancement of research, education, planning in the Danube – Danube Delta – Black Sea macrosystem.

The participants were asked to fill in a 'Thematic Priorities Questionnaire'.

The questionnaire has three main sections:

a) Thematic Priorities related to Horizon 2020 Societal Challenges

b) Thematic Priorities related to the Danube Ecosystem as a whole and its services.

c) Thematic Priorities Related to Water Issues in the Danube Region.

Participants were asked to fill in an 'Educational Priorities Questionnaire'.

Participants were asked to fill in a 'Research Infrastructure Priorities Questionnaire'.

Several comments were made related to the Thematic Priorities Questionnaire:

C1 (from a representative of the science community): Is there a disconnection between what EU proposes and business needs in terms of thematic priorities? Do you actually need this from the scientific (agenda) community?

A: Not really, it depends mostly on country and region, some of the points are of interest for the business community.

C2: The questions are too general, maybe would be better to adapt them on country and region (for example, coastal issues are rather regional, local).

C3: Stakeholders manage the Danube Region by region/country, keeping in mind that it should be seen as a system.

C4: A Better management of the system means to come up with solutions – make innovation – ask how we can use the system to solve the problem.

C5: How to do more with less money - combine efforts from the countries of the Danube Region to achieve something for the entire macrosystem.

C6: Find economic and political solution to these problems in addition to technical solutions.

C7: For each of the identify issues on the scientific agenda create databases per region/system (ex. Maps for soil as a resource, state of conservation, etc.)

A general comment: Put in parallel for a specific question, the answers from the scientist and the business community and make comparisons.

The group discussions for each of the questionnaire continued the next day – 20.03.2014.

The discussions continued, on the results of the questionnaires. For the 'thematic priorities' questionnaire the results were observed in parallel, the inputs from the scientists and the business community (file to be sent separately – in the following phase).
Some comments were made:
C1: the terminology in the questionnaires is not very familiar to people from the business community (in general) and should be adapted.
C2: What people in business would like to see in the questionnaires? Why would they reply?
A: they would replay have on overview of the opportunities in the future. Suggestion: Short description of the purpose of the questionnaire at the beginning would be very welcomed and would make clearer the purpose of the questionnaires.
C3: Go online with the questionnaire – simplify, put it on the DANCERS site, for example.

Then, the participants were given time to complete the other questionnaires, on 'Education Agenda' and 'Research Infrastructures'. The results (their answers and the proposed topics to be added to the questionnaires) are to be communicated.

The meeting ended on Thursday, 20.03.2014.

Annex 1. List of participants:

Name	***Country***	***Organization***
Eva Kopataki <eva.kopataki@aquaprofit.com>	Hungary	Aquaprofit
Attila Korcsog attila.korcsog@aquaprofit.com	Hungary	Aquaprofit
János A. Szabó janos.szabo@hydroinform.hu	Hungary	Aquaprofit
Virgil Dinulescu virgil.dinulescu@fmmc.ro	Romania	FMMC
Madalin Ionita madalin.ionita@fmmc.ro	Romania	FMMC
Viorel Gh. Ungureanu gigi_ungureanu@yahoo.com viorel.ungureanu@marine-research.ro	Romania	Marine Research Ltd.
Alexandru Dan Ionescu office@marine-research.ro	Romania	Marine Research Ltd.
Istvan Gabor	Hungary	MTA CSFK FGI
Balazs Trasy	Hungary	ECTE TTK
Francesco Marabini franco.marabini@bo.ismar.cnr.it	Italy	ISMAR
Jeremy Gault <J.Gault@ucc.ie>	Ireland	University College Cork
Gilles Lericolais Gilles.lericolais@ifremer.fr	France	IFREMER

Jeanne Gherardi <Jeanne.Gherardi@ifremer.fr>	France	IFREMER
Jean – Francois Masset jfmasset@ifremer.fr	France	IFREMER
Vangelis Papathanassiou <vpapath@hcmr.gr>	Grece	Hellenic Centre for Marine Research
Robert Devoy r.devoiy@icc.ie	Ireland	UCC
Panagiotis Michalopoulos <pmichalo@hcmr.gr>	Grece	Hellenic Centre for Marine Research
Olivera ĐURIČIĆ <krkljes.olivera@gmail.com>, <olivera.krkljes@uns.ac.rs>	Serbia	University of Novi Sad
Andrew Tyler <a.n.tyler@stir.ac.uk>	United Kingdom	University of Stirling
Chris Bradley <c.bradley@bham.ac.uk>	United Kingdom	University of Birmingham
Georg Umgiesser georg.umgiesser@ismar.cnr.it	Italy	ISMAR
Gretchen Gettel <G.Gettel@unesco-ihe.org>	Holland	UNESCO - IHE
Janusz Dominik Janusz.Dominik@unige.ch	Switzerland	Univ. Geneva
Nicolai Berlinski nberlinsky@ukr.net	Ukraine	Research Centre Noosphera
Bulla Miklos <miklosbulla@t-online.hu>, <miklos.bulla@vm.gov.hu>	Hungary	University Istvan Szecheny of Gyor
Jos Brils Jos.Brils@deltares.nl	Netherlands	DELTARES
Alexandra Vancea alexandra.vancea@ancs.ro	Romania	MEN
Manuela Sidoroff <manuelasidoroff@yahoo.com>	Romania	INSB
Simona Litescu <slitescu@gmail.com>	Romania	INSB
Mihaela Paun <mihaela.paun@gmail.com>	Romania	INSB
Andrei Paun <andreipaun@gmail.com>	Romania	INSB
Gheorghe Oaie goaie@geoecomar.ro	Romania	GeoEcoMar
Adriana Constantinescu adriana.c@geoecomar.ro	Romania	GeoEcoMar
Cristian Cudalbu c.cudalbu@geoecomar.ro	Romania	GeoEcoMar
Madalina Nailia	Romania	GeoEcoMar

madalina@geoecomar.ro		
Adrian Stanica astanica@geoecomar.ro	Romania	GeoEcoMar

Annex 2. Agenda of the meeting

19 / 20 March 2014

Venue: ***HOTEL HOWARD JOHNSON –*** *Calea Dorobantilor nr. 5-7, Sector 1****, Bucharest***

Wednesday 19 March 2014

09.30 –10.00 **Registration of participants**

10.00 -10.10 **Welcome addresses**

Adrian Stanica, Scientific Director of GeoEcoMar

Introduction of participants

Tour de table

10.10 -10.35 **New Research and Innovation oportunities provided by the Horizon 2020 Programme in the Danube Region**

Alexandra Vancea, Marie Curie Coordinator – Ministry of National Education – Activity of Research

10.35 -10.50 **Presentation of FP 7 DANCERS Project**

Adrian Stănică – project coordinator (RO)

10.50 -11.20 **Presentation of the DANCERS Data Base of Projects**

Mihaela Păun, NISB

11.20 – 11.50 **Coffee break**

11.50 – 12.20 **Opportunities for European Cooperation within Horizon 2020 – Societal Challenge 5 on Integrated Management of River- Delta – Sea Systems (Life Sciences, Earth Sciences, Environmental Sciences, Water Cycle)**

Adrian Stanica, project coordinator on behalf of Christos Fragakis, EC Officer, DG Research and Innovation

12.20 – 12.40 **Introduction to the workshop. Methods and programme**

Moderator: Panagiotis Michalopoulos, HCMR

Adrian Stănică – project coordinator (RO)

12.40 – 13.00 **Group discussion of state of research in the Danube Region.**

Participants will be asked to analyse this in terms of businesses (opportunities):

What is strong
What appears to be missing

What should be strengthened
By taking into account: domain / geographic distribution / field of interest

13.00 – 14.00 **Working lunch**

14.00 – 15.30 **Mapping of existing projects in Danube Area.**

15.30 – 16.00 **Coffee break**

16.00 – 17.00 **Development of a successful research & innovation agenda in the Danube – Black Sea Region (as support for innovative businesses in this area)**

Group discussions

17.00 – 18.00 **Medium and long term needs on human resources (education programs) in the field of water management and research in the Danube – Black Sea Region**

Group discussions

19.00 – 21.30 **Working dinner**.

Thursday 20 March 2014

09.00 - 09.10 **Welcome and agenda of the day**

Adrian Stănică, GeoEcoMar

09.10 – 10.10 **Ideas of a new distributed Research Infrastructure in the field of water management and research in the Danube – Black Sea Region, in support of businesses.**

Group discussions

10.10 – 10.40 Coffee break

10.40 - 12.00 **Conclusions of the Workshop**

All partners

12.30 – 14.00 **Joint lunch**

7.4. Atelierul International: „Suport stiintific in luarea de decizii in managementul apei din Regiunea Dunarii" 25-26.05.2014

7.4.1. Annex 5 – Minuta intalnirii

1. Welcome and introduction

The meeting began with the welcoming address of Dr. Gheorghe Oaie, the General Director of GeoEcoMar. He showed the importance of the two major projects in the Danube Region, DANUBIUS – RI and DANCERS, their links and convergent points, as DANCERS will create a solid scientific base and will gather important information that will be used in DANUBIUS – RI project.

Ms. Viorel Vulturescu, Director of the Directorate Programs for European and International RDI Priorities, Ministry of National Education, followed, with an introductory address.

The chairman of the Workshop, Martin Felix Gajdusek, introduced the purpose of the meeting – establishing dialog with the decision makers from the Danube Region and gathering their opinions on scientific activities that support their needs and activity. The instruments were then presented, plenary rounds on specific topics (that will be presented and detailed thereafter), working in groups and filing a questionnaire until the end of the meeting (see Questionnaire in Annex…..).

2. Introduction to DANCERS project

Dr. Adrian Stanica, introduced the project DANCERS - "DANube macroregion: Capacity building and Excellence in River Systems (basin, delta and sea)". The main aim of the project is to develop new instruments and tools that will enhance environmental research and promote innovation in Danube Region, including the Danube Delta and the Black Sea. The new instruments and tools do not start *ab initio* but will build on existing projects and expertise. The project will analyze the achievements in the integrated management of the river-delta-sea management in the Danube Region, to understand the links between the results and the work performed and to define a set of instruments to enhance environmental research and innovation in the Danube Region. The project consortium comprises institution from 5 countries from the Danube Region (Germany, Austria, Hungary, Serbia and Romania) and from the EU (France, Greece, Ireland, Italy, Spain, UK) and UNESCO-IHE.
DANCERS looks at three main areas: science, human potential and research infrastructure from the perspective of scientist and academia, decision and policy makers and business community. Thus, the project will establish a competitive research agenda for the Danube Region, to use it later as a model for river- delta-sea systems worldwide.

3. Results from DANCERS meta database of Projects, Programmes and Initiatives in the management of river-delta-sea in the Danube Region

The metadatabase of the project was presented by Eva Feldbacher, from Wassercluster Lunz, AUSTRIA. The objective of the DANCERS database was to gather all existing information about the projects and their results, regarding water management results in the Danube Region over the last 20 years. Their analysis allowed for the identification of strengths and weaknesses, links and gaps in water management issues in the Danube Region. Furthermore, the database provides easy access to collected data and promotes the sharing of obtained knowledge.

The metadatabase comprises information about the person who entered a record (date, author, contact, id) and about the project depicted (title, date, abstract, descriptive keywords). Most of the data entered was provided via the internet questionnaire at **http://wcl-geo.boku.ac.at/geonetwork/srv/eng/search**. The metadatabase stays open for further entries and will remain active after the project end in 2015.

The data entered in the database was analysed, and the results were presented by Dr. Mihaela Paun, from the Romanian Institute for Biological Sciences.
The results reveal that, out of 468 recorded answers, 370 projects are completed and 98 are ongoing. There are 26 coordinating countries, from which Austria and Romania are leading, with 30 % each, of the projects in the Danube Region. Regarding their thematic area, most of the projects were multidisciplinary, but many included both life and earth sciences, or life sciences and socio-economics. Around 36% of the projects were carried out in the 'research – development and upgrading the existing infrastructures' programme, while ~32 % of the projects had as main objective environmental monitoring and measurements. Maintenance of navigation and scientific cooperation were each represented in over ~7% of the projects. The projects concerned with human resources and education only represented 0.6 % of the entered data. Regarding the funding type, 30% of the projects in the DANCERS data base, were funded by national R&D funds, ~20% from EC-DGRI funds, ~10% from EC-otherDG's, and the rest from other national or international funding programmes.
The data base is a major contribution to the scientific community and is still active, but it lacks input, especially from the other countries of the Danube Region, that are not DANCERS members.

4. Introduction to DANCERS questionnaire (model in Annex 3)

In order to gather relevant data from three categories targeted, scientists, business and policy makers, a questionnaire was developed. Dr. Panagiotis Michalopoulos presented the questionnaire to the policy makers present at the workshop. The questionnaire will seek the opinions of stakeholders in order to help shape the priorities of R&I agenda in the Danube Region and will give input for the formulation of concrete proposals on research priorities, education and research infrastructures.
The questionnaire represents a tool to build on a critical analysis on the state of the art of the Danube – Black Sea macrosystem. It makes reference to Horizon 2020, the EU's framework programme for R&I, which implements Europe's flagship initiative aimed at securing Europe's global competitiveness. The questions reflect the Societal Challenges – the policy priorities addressing the major concerns of citizens across Europe, but with a focus on the Danube macroregion. The questions are the same, for the three main stakeholders, scientists, business community and policy makers, thus facilitating the direct comparisons of answers. The questionnaire also allows for the direct comparison of answers across geographic regions and sectors of activity and for their quantitative assessment.
The questionnaire will be placed online, and other representatives of the three target categories are invited to answer.

5. **Plenary discussion: how and in which fields does research currently contribute to public water management challenges in the Danube Region? What is the experience? What is missing?**

The participants were invited to discuss on the questioned addressed. The results of the discussion revealed that:

- Experience of Croatia – scientific research and water quality assessment is done by universities
- The system of financing for the projects in EU countries is different, there are projects of fundamental research or applied research, so the focus on the application that these projects have for the stakeholders and policy makers, should represent **research for good practise.**
- Experience of Germany – the federal ministry for research has special programmes, but there are also those from the land ministries (regional level)
- Experience of Romania:
    - regarding the water infrastructure – research results and technology are needed to develop the actual infrastructure and these new technologies should be connected with the end-users, to implement new standards, **develop new services to improve navigation on the Danube for ex.**
    - The implementation of the water framework directive raised some problems and the authorities could not find the scientific capacity to solve it, the same happened with the marine strategy, particularly in the open sea area. They usually need a straight answer in a limited time span but the general answer is "more research is needed".
- Experience of Serbia – the academia and end-users view a problem in different ways, so sometimes the call for funding is not in agreement with the true needs. To find the link between the two categories and increase interaction in discussion and meetings is needed.
- Experience of Moldavia – there is a need for developing new criteria and methodology for monitoring water quality. Involving general public in water quality assessment is very useful for general education.
- Experience of Bulgaria – there are already scientific results that can be used to upgrade the current policies.

+Other results (to be completed)

6. **Danube River Basin: current activities to identify water management challenges in the region**

The presentation was delivered by Mr Felix Martin Gajdusek – summary from Felix

7. **Sharing experience: Improving water management in Moldova**

Mrs Irina Coseru, from the National environmental Centre of the Republic of Moldova shared same of their experience in integrated management of water resources in Moldova. The main problems are related to water quality, as many of the rivers in Moldova are polluted by industrial activities and some of the water is used for irrigation, directly from the polluted rivers. Another problem is the diminished capacity of wastewater treatment plants, so a fraction of the used water is discharged directly in the surface waters. Many projects are carried out for the

ecological rehabilitation of the rivers, the water quality and biological status are monitored constantly. An important part is played by local communities and general public that was involved in this project, with the aim of raising awareness on the benefits of clean waters and healthy landscapes and of the dangers of pollution and contamination of drinking water.

8. **Interactive working session in three groups on:**
   - **Information needs of public authorities**
     - Perform obligations under EU directives – methods, indexes to evaluate the status of water bodies, hazards and risks
     - Solutions for practical questions
     - Integration between different management bodies
     - Integrating data bases, even in a transboundary way
     - Practical information on current scientific activities – ex DREAM and DANUBIUS
     - Forecast (water level) mid and long term
     - Morphological changes
   - **Potential contribution of research in support of public authorities**
     - RISSS – R&I strategies for smart specialisation
     - Modelling
     - Improved observations and assessment methods
     - Risk assessment

+Results (to be completed)

9. **The role of research in the current PA 5 developments (EUSDR PA 5: 'To manage environmental risks')**

The presentation was delivered by Peter Bakonyi, former PA 5 coordinator. He presented the PA 5 targets and the actions planned for each of the targets:

- **Implement Danube wide flood risk management plans** - due in 2015 under the Floods Directive – to include significant reduction of flood risk by 2021, also taking into account potential impacts of climate change;
  - **Action**: "To develop and adopt one single overarching flood management plan at basin level"
  - **Action**: "To support wetland and floodplain restoration as an effective mean of enhancing flood protection (use of "green infrastructure")".
  - **Action**: "To extend the coverage of the European Floods Alert System (EFAS) system to the whole Danube river basin"
  - **Action**: "To strengthen operational cooperation among the emergency response authorities in the Danube countries and to improve the interoperability of the available assets"
- **Update of the Accidental Risk Spots inventory** at the Danube River Basin level by 2013;
  - **Action**: "To continuously update the existing database of accident risk spots (ARS Inventory), contaminated sites and sites used for the storage of dangerous substances"

- **Action**: "To develop rapid response procedures and plans in case of industrial accidental river pollution

- **To address the challenges of water scarcity and droughts** based on the 2013 update of the Danube Basin Analysis and the ongoing work in the field of climate adaptation, in the Danube River Basin Management Plan to be adopted by 2015
  - **Action**: "Anticipate regional and local impacts of climate change through research".
  - **Action**: "To develop spatial planning and construction activities in the context of climate change and increased threats of floods".

These targets and actions are in accordance and hence supported by some of the European Directives, and involve ICPDR and national ministries through national projects.

Questions followed:

Q1: Any of the research projects mentioned had results that were actually used? Is the socio-economic part important?

A1: They are at the beginning of the process of 3 years, with no money for investment. They used the projects already running and the output of the projects will be used for further development to develop the Priority Areas. The socio-economic side is not yet included.

Q2: Do you have an internal working group.

A2: No predefined governance of the PA exists, but they have a steering group, with members of the 14 countries members of the Danube Region.

Q3: How much is the sea taken into account?

A3: Action1- for coastal zone, river-Black Sea interaction is in PA4 and flooding in PA 5.

10. Interactive working session in two groups on:

- **improving interaction between science and administration – limits and challenges, current strengths and weaknesses**

Results (to be completed)

11. Overview of the current initiatives and coordination projects across the Danube – Black Sea system: the role and perspective for research

Presentation missing – summary from Felix

12. Hrvatske Vode – Croatia

Miroslav Matkovic was invited to deliver a presentation on Hrvatske Vode, a legal entity that manages water and public water estate as well as protective and hydro-ameliorative water structures in the Republic of Croatia. Hrvatske vode is a non-budgetary fund which redistributes and allocates as a part of the GDP (water charges and a part of budgetary funds) to water regulation, protection from adverse effects of water as well as to municipality users through water supply, sewerage and wastewater treatment projects. As distinguished from budgetary funding, Hrvatske vode offers direct expert, technical, economic and legal assistance to municipal users in defining, preparing and implementing projects of varying complexity. Hrvestke vode uses allocated funds through water management plans, whereas the annual revenues and expenditures plan needs approvement of the Parliament of the Republic of Croatia. They made a guide on the restoration of rivers that is available online.

13. Common strategy for sustainable territorial development of the cross-border area Romania-Bulgaria (CBC project SPATIA)

Pavel Milenov from the Remote Sensing Applications Center (ReSAC) presented briefly the elements of this project, focusing on a common territorial data base and preparing complementary instruments for territorial monitoring and development. The objective of the project is to provide a comprehensive and accurate overview of the social, economic and territorial condition and the evolution of the Romania-Bulgaria cross-border area between 2009-2015. The Romanian and Bulgarian partners aim to develop a comprehensive spatial database that follows the INSPIRE principles, for the cross-border area and for the elaboration of common strategy for sustainable territorial development and form monitoring the impact of national and EU policies. The first result presented was the mapping of Giurgiu – Ruse area, on the Lower Danube. One of the outcomes of the project may be upgrading this data base for flood risk zones and cultural heritage.

Other planned initiatives at trans-national level are:

- Support to the trans-border/national cooperation BG-RO, BG-FYROM, BG-SR, BG-GR, and in the future SEE in general
- Establishment of a mechanism for regular EO monitoring and changes detection for SEE region (The European Network of Regional Centers Initiative)
- Technical and methodological support to the Regional Center for Lower Danube in Euroregion Ruse/Giurgiu
- Possible joint activities with Austria and pilot studies within EAGLE group
- Possible joint activities with Germany (Baden-Wuerttenberg and Bavaria)

14. Interactive working session on

- **Indicators for significant action R-Agenda & Training Education**
- **……..**

Results (to be completed)

Annex 1 – Agenda of the meeting

Agenda

Workshop with policy makers, decision makers and administrations

26 - 27 May 201

Venue: Hotel Howard Johnson, Calea Dorobantilor nr. 5-7, Sector 1, Bucharest

Monday 26 May 2014

14:00 – 14:20 **Welcome addresses**

Gheorghe Oaie, General Director of GeoEcoMar

Viorel Vulturescu, Director, Programs for European and International RDI Priorities Directorate, Ministry of National Education

Tour de table

14:20 – 14:35 **Introduction to the FP 7 DANCERS Project**

Adrian Stănică, GeoEcoMar, project coordinator

14:35 – 14:50 **Results from DANCERS Meta Data Base of Projects, Programmes and Initiatives in the management of river-delta-sea in the Danube Region**

Mihaela Paun, NISB *and Eva Feldbacher*, WCL

14:50 – 15:00 **Introduction of DANCERS questionnaire**

Panagiotis Michalopoulos, HCMR

15:00 – 15:30 **Brainstorming Round 1 (Plenary)**

Guiding question: How and in which fields does research currently contribute to public water management challenges in the Danube region?

Moderation: Martin Felix Gajdusek, ZSI

15:30 – 15:45 **Danube River Basin: Current activities to identify water management challenges in the region**

Martin Felix Gajdusek, ZSI

15:45 – 16:10 **Extending the results from Brainstorming Round 1 (plenary)**

Moderation: Martin Felix Gajdusek, ZSI and Adrian Stănică, GeoEcoMar

16:10 – 16:30 Coffee break

16:30 – 16:45 **Sharing experiences – Improving Water Management in Moldova**

Ina Coseru, Chair of the National Environmental Center

16:45 – 17:40 **Interactive working session**

(in 3 groups, moderation and documentation self-organised)

Guiding questions:

- Information needs of public authorities
- Potential contribution of research in support of public authorities

17:40 – 18:20 **Presentation of the results from the 3 groups**

Information needs of public authorities and the potential contribution of research for solving most pressing problems

Moderation: Martin Felix Gajdusek, ZSI and Adrian Stănică, GeoEcoMar

20:00 – 22:00 **Working dinner**

Tuesday 27 May 2014

09:30 – 9:45 Concluding work on the Interactive working session from day1: Revision of the identified elements and core definitions for elements of a strategic research agenda, infrastructure needs, Education/Training agenda

9:45 – 10:05 **The role of research in the current PA 5 developments** (EUSDR PA5:"To manage environmental risks")

Péter Bakonyi, Emeritus EUSDR PA5 Coordinator and ICPDR FP EG Chairman

10:05 – 11:15 **Interactive working session**

(in 2 groups, concluding with a presentation of the results from the groups in the plenary)

Guiding questions:

- From information sharing to active collaboration with researchers: Limits and challenges for the public authorities
- Current strengths and weaknesses in existing co-operations

Moderation: Martin Felix Gajdusek, ZSI and Adrian Stănică, GeoEcoMar

11:15 – 11:40 Coffee break

11:40 – 11:55 **Overview on the current initiatives and coordination projects across the Danube – Black Sea system: The role and perspective for research**

Martin Felix Gajdusek, ZSI

11:55 – 12:10 **Common Strategy for Sustainable territorial Development of the**

cross-border area Romania-Bulgaria (CBC project SPATIA)

Pavel Milenov, Remote Sensing Applications Center (ReSAC)

Interactive working session ("Fish bowl" in both rounds)

12:10 – 12:35 **Round 1:**

Cornerstones of a successful research agenda in the Danube – Black Sea Region

12:35 – 13:00 **Round 2:**

Requirements for education and training plans in the field of integrated water management in the Danube – Black Sea Region

12:35 – 13:15 **Reflection of the results from Round 1+2 (Pinboard)**

13:15 – 14:30 **Working lunch**

14:30 – 16:00 **Prioritisation and possible roadmap of identified key activities**

Martin Felix Gajdusek, ZSI

Adrian Stănică, GeoEcoMar

16:00 – 17:00 **Summarizing Outcomes and wrap-up of the Workshop in the SWOT matrix**

All partners

Annex 2 – List of participants

No.	Name, Surname	Country	Organization
1	**Mary Jeanne Adler** mj.adler@hidro.ro	Romania	National Institute for Hydrology and Water Management
2	**Peter Bakonyi** peterbakonyi@hotmail.com	Hungary	Environmental Protection and Water Management Research Institute
3	**Zaneta Ostojic Barjaktarevic** z.ostojic@ic-group.org	Serbia	Directorate for Inland Waterways
4	**Petru Boieriu** p.boeriu@unesco-ihe.org	Netherlands	UNESCO-IHE
5	**Mikols Bulla** Miklos.Bulla@vm.gov.hu	Hungary	Szechenyi Istvan University of Gyor
6	**Piere Paolo Campostrini** campostrini@corila.it	Italy	CORILA
7	**Iuliana Cantaragiu** iuliana.cantaragiu@environment.md	Moldova	National Environmental Center
8	**Gheorghe Constantin** gheorghe.constantin@mmediu.ro	Romania	Ministry of Environment and Forests
9	**Adriana Constantinescu** Adriana.c@geoecomar.ro	Romania	GeoEcoMar
10	**Ina Coseru** ina.coseru@environment.md	Moldova	National Environmental Center
11	**Caterina Dabala** dabala@corila.it	Italy	CORILA
12	**Eva Feldbacher** Eva.Feldacher@wcl.ac.at	Austria	WasserCluster Lunz Biologische Station GmbH
13	**Martin Felix Gajdusek** gajdusek@zsi.at	Austria	Zentrum Fuer Soziale Innovation
14	**Snezana Radulovic** snezana.radulovic@dbe.uns.ac.rs	Serbia	University of Novi Sad
15	**Mihaela Irimia**	Romania	Lower Danube River

			Administration
16	**Fritz Kohmann** Kohmann@bafg.de	Germany	Federal Institute of Hydrology, Koblenz
17	**Zoran Lukic** zlukic@plovput.rs	Serbia	PLOVPUT
18	**Miroslav Matkovic** Miroslav.Matkovic@voda.hr	Croatia	Croatian Waters
19	**Panagiotis Michalopoulos** pmichalo@hcmr.gr	Greece	Hellenic Centre for Marine Research
20	**Kristian Milenov** k.milenov@stalkerkm.com	Bulgaria	Agency for Sustainable Development and Eurointegration-ECOREGIONS
21	**Madalina Nailia** madalina@geoecomar.ro	Romania	GeoEcoMar
22	**Gheorghe Oaie** goaie@geoecomar.ro	Romania	GeoEcoMar
23	**Andrei Paun** andrei.paun@gmail.com	Romania	INCDSB
24	**Mihaela Paun** mihaela.paun@gmail.com	Romania	INCDSB
25	**Tom Preston** Tom.Preston@glasgow.ac.uk	UK	University of Glasgow
26	**Camelia Pulbere**	Romania	Dobrogea - Littoral Water Directorate – Romanian Waters National Administration
27	**Albert Scrieciu** albert.scrieciu@geoecomar.ro	Romania	GeoEcoMar
28	**Romeo Soare** romeo.soare@afdj.ro	Romania	Lower Danube River Administration
29	**Adrian Stanica** astanica@geoecomar.ro	Romania	GeoEcoMar
30	**Vassil Vassilev** vassil.vassilev@resac-bg.org	Bulgaria	Remote Sensing Application Center – ReSAC
31	**Viorel Vulturescu**	Romania	Ministry of National Education
32	**Jeanne Gherardi** jeanne.gherardi@ifremer.fr	France	IFREMER

33	**Simona Litescu**	Romania	INCDSB

Annex 3 – Questionnaire

DANUBE MACROREGION: CAPACITY BUILDING AND EXCELLENCE IN RIVER SYSTEMS (BASIN, DELTA AND SEA)

Stakeholder Questionnaire for the Danube Macro Region

The aim of the FP7 DANCERS project is to develop new instruments and tools that will enhance environmental research and promote innovation in Danube Region, including the Danube Delta and the Black Sea. Importantly, the new instruments and tools do not start ab initio but will build on existing projects – covering multiple source of funding (public, private or PPP), whether national, regional or European. Here we seek the opinions of stake holders to help shape the priorities for research and innovation in the Danube Region. Here we also make reference to Horizon 2020, the EU's framewrok programme for research and innovation, which implements Europe 2020 flagship initiative aimed at securing Europe's global competiteveness. The focus of this questionnaire relfects the Societal Challenges: the policy priorities addressing the major concenrs of citizens across Europe, but with a particular focus on the Danube macro region. More details for Horizon 2020 can be found at: http://ec.europa.eu/programmes/horizon2020/.

The following questionnaire should be considered as a tool to build on a critical analysis on the state of the art of the Danube – Black Sea Macrosysteme. The outcomes will be grouped according to the main three pillars of R&D: Science & Innovation agenda, Research Infrastructures and Human Potential. This research forms part of the second work package in the DANCERS project and we aim to report the initial results at a meeting in Bucharest on the 8-9th September and online at at: http://www.dancers-fp7.eu/.

Please complete the following before staring the questionnaire

i. Gender Male □ Female □

ii. Age Profile <30 □ 31-40 □ 41-50 □ 51-60 □ >61 □

iii. Employment Sector:

Industry:

Agriculture □
Commerce □
Energy □
Environment (including consultancy) □
Manufacturing □
Tourism □
Water □
Other (please specify) □

Education:

Training □
University – non science □
University - science □

Research & Science:
Government Research Institution □
Other (please specify) □

Policy Makers:
Local □
Regional □
National □
European □

iv. Do the views you are reporting reflect:
- **your institution** □
- **you as individual** □

v. Country in which you are based

Within the Danube Catchment (name) _____

Outside the Danube Catchment (name) _____

Questionnaire Instructions:
The questionnaire is structured in 4 sections. Please complete sections 1 and 2 and as much of sections 3 and 4 as you feel suitably qualified to answer.

Section 1 : Infrastructure priorities - Related to Horizon 2020 Societal Challenges in the Danube region
Section 2 : Thematic priorities - The priorities for research to foster sustainable resource use
Section 3 : Business priorities - The challenges and opportunities for sustainable business development
Section 4 : Educational priorities - The educational requirements required to meet the societal challenge

Section 1: INFRASTRUCTURAL PRIORITIES

Related to Horizon 2020 Societal Challenges in the Danube Region

1.1. Do you believe there is a need for a new research center in the field of rivers to sea macro-systems processes at an EU / International level?

Yes ❑ **No ❑** **Don't know ❑**

Conditional response:

If **Yes** to the Q1:

1.1a: Do you believe that a new research infrastructure dedicated to Danube-Black Sea Macrosystem Processes could be an essential component in international understanding of rivers to sea macro-systems processes?

Yes ❑ No ❑ Don't know ❑

If **No,** then briefly explain your response:

_____

_____

_____

1.2 For the Danube Region do you believe this could be achieved by either
a) Upgrading existing infrastructure and transnational communication alone ❑
b) The establishment of a new infrastructure to co-ordinate / focus current efforts? ❑
c) Don't know ❑

Conditional response:

If **b** to the Q2:

Which should be the main priorities for the activities carried out in a new research infrastructure ?

Priority	High (7) to Low (1)						
	7	6	5	4	3	2	1
Education							
Fundamental Research							
Applied Research/Innovation/ Technology							
Observation/ Data gathering and archiving							
Experimental Facilities							
Expert Analysis/Consultation							
Advising on Policy/Regulation							
Coordination with other –global-riverine/delta infrastructures							
Other (please add):							

1.3 Please indicate the themes you consider research priority in the context of the Danube-Balck Sea Macrosystem . You can add other research priorities in the blank fields.According to your own expertise.

Themes	Rank from High Priority (1) to Low (9)
Maintaining ecosystem sustainability	
Developing safe water systems for citizens	
Assessing an managing ecosystem resiliance to environmental change	
Hazard Mitigation	
Developing Basing-Delta-Sea observation platforms	
Promoting competitiveness in the water industry	
Implementing a water-wise bio-based economy	

Closing the water cycle gap	
Promoting environmental stewardship	

1.4. Which of the following do you consider the biggest challenges/risks in the planning and operation of a new research infrastructure in the Danube region ?

Challenge	High Risk (7) to Low (1)						
	7	6	5	4	3	2	1
Financial Security/Funding							
Organization Structure							
Integration with existing infrastructures							
Quality of Staff-Facilities/ Appeal to targeted end-users							
Defining appropriate thematicareas							
Obtaining continuous support/endorsement from regional/national/international stakeholders							
Other (Please add):							

1.5 List, in order of priority: a) the barriers (e.g. regulatory, physical, political); and b) opportunities (e.g. funding, cooperative initiatives) to an integrated catchment management system for the Danube Macro Region

Barriers	Priority order

Opportunities	Priority order

1.6. What technologies or tools are required to overcome these barriers to an integrated catchment management system for the Danube Macro Region ?

1.7. What areas for investment should be prioritized to influence the economic development of the Danube Macro Region?

Section 2: THEMATIC PRIORITIES

The priorities for research to foster sustainable resource use

2A : Related to Horizon 2020 Societal Challenges in the Danube Region

Horizon 2020 framework societal challenges will be the guiding principles for the future European research

2.1. Which are the most relevant scientific areas in terms of societal challenges In the Danube region?

Scientific Areas	Very Relevant (7) not relevant (1)						
	7	6	5	4	3	2	1
SC 1 : Health, demographic change and wellbeing							
SC 2 : Food Security, sustainable agriculture, marine and maritime research and the bio-economy							
SC 3 : Secure, clean and efficient energy							
SC 4: Smart, green and integrated transport							
SC 5 :Climate action, resource efficiency and raw materials							
SC 6 : Inclusive, innovative and reflective societies							
SC 7 : Secure societies to protect freedom and security of Europe and its citizens							

2.2. With respect to Societal Challenge 2 (Food Security, sustainable agriculture, marine and maritime research and the bio-economy) which themes are more relevant in the Danube region.

Theme	Very Relevant (7) not relevant (1)						
	7	6	5	4	3	2	1
Sustainable agriculture and forestry							
Sustainable and competitive agri-food sector for a safe and healthy diet							
Unlocking the potential of aquatic living resources							
Sustainable and competitive bio-based industries							

2.3 With respect to Societal Challenge 3 (Secure, clean and efficient energy) which themes are more relevant in the Danube region.

Theme	Very Relevant (7) not relevant (1)						
	7	6	5	4	3	2	1
Reducing energy consumption and carbon footprint through smart and sustainable usage							
Low-cost, low-carbon electricity supply							
Alternative fuels and mobile energy sources							

A single, smart European electricity grid							
New knowledge and technologies							
Robust decision making and public engagement							
Market uptake of energy innovation, empowering markets and consumers							

2.4. With respect to Societal Challenge 5 (Climate action, resource efficiency and raw materials) which themes are more relevant in the Danube region

heme	Very Relevant (7) not relevant (1)						
	7	6	5	4	3	2	1
Fighting and adapting to climate change							
Sustainably managing natural resources and ecosystems							
Ensuring the sustainable supply of non-energy and non-agricultural raw materials							
Enabling the transition towards a green economy through eco-innovation							
Developing comprehensive and sustained global environmental observation and information systems.							

2B : Thematic Priorities Related to the Danube Ecosystem and ecosystem services

2.5. The Millenium Ecosystem Assesment Report has identified the following risks to ecosystem services that are most likely to lead to irreversible downgrading in the future. Please rank them with respect to their importance in the Danube region. Add any other risk you consider appropriate and rate its importance.

Risk to ecosystem services	Very Important (7) not important (1)						
	7	6	5	4	3	2	1
Water Cycle. Water withdrawals from rivers and lakes for irrigation or for urban or industrial use, large reservoir construction.							
Carbon Cycle. Changes on ecosystem function as a net source/sink of CO2 due to afforestation, reforestation and forest management, degradation of agricultural, pasture,and forestlands, land use change, changed agriculture practices, the fertilizing effects of nitrogen deposition and increasing atmospheric CO2 .							
Nitrogen Cycle. Increase in reactive or biologically available nitrogen due to use of fertilizers and its effects in terrestrial and marine ecosystems							
Phosphorous Cycle. Increased use of phosphorous fertilizers and other substances, accumulation in agricultural soils and its effects in terrestrial and marine ecosystems.							
Other (Please add):							

2.6. In the past 50-100 years, the following direct drivers have caused significant changes in **terrestrial** ecosystem and their services. Based on your expert opinion, rank the most important direct drivers in terrestrial ecosystems of the Danube region likely to cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other direct drivers you may consider relevant.

Drivers: Terrestrial ecosystem	Very Important (7) not important (1)						
	7	6	5	4	3	2	1
Land cover change							
New technologies for the provision of food, timber, fiber..							
Pollution/nutrient loading							
Climate change							
Changes in fishing practices							
Disruption of the sedimentary regime							
Development of extensive "hard" flood protection systems & destruction of wetlands							
Other (Please add):							

2.7. In the past 50-100 years, the following direct drivers have caused significant changes in **freshwater** ecosystems and their services. Based on your expert opinion, rank the most important direct drivers in **freshwater** ecosystems of the Danube region that will cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other drivers you consider relevant.

Drivers: Freshwater	Very Important (7) not important (1)						
	7	6	5	4	3	2	1
Modification of water regimes (from water abstraction / consumption and uses, hydrotechnical interventions, etc)							
Alien species and biodiversity changes / species alteration							
Pollution/nutrient loading							
Climate change							
Environmental accidents							
Energy (hydro power)							
Fishing and acquaculture							
Other (Please add):							

2.8 In the past 50-100 years, the following direct drivers have caused significant changes in **coastal & marine** ecosystem and their services. Based on your expert opinion, rank the most important direct drivers in **coastal & marine** ecosystems of the Danube region that will cause changes in Ecosystem Services in the future (i.e. next 20 years). Add other drivers you consider relevant.

Drivers: coastal & marine	Very Important (7) not important (1)						
	7	*6*	*5*	*4*	*3*	*2*	1
Fishing pressures							
Alien species							
Land, River,Ocean-based Pollution/Nutrient loading							

Climate change							
Habitat Loss/Conversion							
Sediment Starvation							
Navigation							
Flooding							
Dams and jetties construction							
Biodiversity initiatives – regulations (conventions to which Danube Delta Biosphere Reserve adhered							
Tourism							
Other (please add):							

2.9. Please indicate the importance of the following **anthropic influences/ human influences** on ecosystem processes in the Danube Region with respect to where the scientific effort should be directed.

Human influences	Very Important (7) not important (1)						
	7	6	5	4	3	2	1
Disease emergence (e.g. flooding due to climate change can cause the spread of edidemics).							
Fisheries collapse							
Species introductions and losses							
Regional climate change							
Eutrophication and hypoxia							
Legacy and Emerging contaminants							
Changes in Agriculture usage							
Ecological Restoration							
Genetic Pollution							
Alteration of Sediment dynamics due to re-modelling including dams, coastal protection, restoration							
Global Climate change Sea level rise							
Forestry							
Land use change							
Other (Please add):							

2.10 Please indicate which of the following Provisioning Ecosystem Services are more relevant for the Danube Region:

Theme	Very Relevant (7) not relevant (1)						
	7	6	5	4	3	2	1
Food							
Raw materials for textile industry							
Fuel							
Genetic resources							
Pharmaceutical and natural medicines,							
Fresh water							
Other (please add):							

2.11 Please indicate which of the following Regulating Ecosystem Services are more relevant for the Danube Region:

Theme	Very Relevant (7) not relevant (1)

	7	6	5	4	3	2	1
Air quality maintenance							
Climate regulation							
Water regulation							
Erosion control							
Water purification and waste treatment							
Regulation of human diseases.							
Pollination.							
Storm protection.							
Other (please add)							

2.12 Please indicate which of the following Cultural Ecosystem Services are more relevant for the Danube Region:

Theme	Very Relevant (7) not relevant (1)						
	7	6	5	4	3	2	1
Cultural diversity							
Spiritual and religious values							
Knowledge systems (traditional and formal)							
Educational values							
Inspiration							
Aesthetic values							
Social relations							
Sense of place							
Cultural heritage values							
Other (please add)							

2.13 Please indicate which of the following Supporting Ecosystem Services are more relevant for for the Danube Region

Theme	Very Relevant (7) not relevant (1)						
	7	6	5	4	3	2	1
Soil formation and retention							
Nutrient Cycling							
Primary Production/ Photosynthesis/Production of Atmospheric Oxygen Gas							
Water cycling							
Provisioning of habitat							
Other (please add):							

2.14 Sustainable Ecosystems (monitoring of threats, risk assessment, climate change scenarios) Please identify which fields in each theme described below you consider a priority

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Ecological engineering (restoration of ecosystems, ecosystems resilience characterization)							
Ecohydrology (relationships between hydrological processes and biotic dynamic; ecosystem responses)							
Managing the effects of hydro climatic extremes on ecosystems (monitoring of drought events and water scarcity; early warning system; water management)							
Developing ecosystem services approaches (ecological functionning of ecosystems, economic value assessment of ecosystem services)							
Other (please add):							

2C : Thematic Priorities Related to Water Issues in the Danube Region

*The following questions (15-18) define themes of future water strategies. Within each of the identified fields, please consider and score the a priority for a **water strategy** **in** the Danube region.*

2.15 Please consider and score the priority for each theme to develop **Safe Water Systems** for citizens under a water strategy **in** the Danube region for

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Emerging pollutants: assessing their effects on nature and humans, their behaviour and treatment opportunities							
Minimizing risks associated with water infrastructures and natural hazards (towards urban flood proof cities; Exploiting ageing urban water systems for dependable and cost-effective service)							

2.16 Please identify which fields you consider a priority for promoting the **competitivenes of the Water Industry** in the Danube region

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Developing market-oriented solutions for the water industry (smart technology, water treatment)							
Enhancing the regulatory framework (removing barriers to innovation)							

2.17 Please consider and score the priority for each theme for **implementing a Water-Wise Bio-based Economy** in a water strategy in the Danube region for

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Improving water use efficiency for a sustainable bio-economy sector (efficient irrigation systems, water conserving farming and forestry)							
Reducing soil and water pollution (efficiency of protection measures on water quality)							

2.18 Please consider and score the priority for each theme for **closing Water Cycle Gap** in a water strategy in the Danube region

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Sustainable water management (water platform – observatory, management aquifer recharge)							
Socio-economic approaches to water management							

Questions 19-24 define themes of water policies or activities. Please consider and score each of the themes identified below as a priority in water activities and management in the Danube region.

2.19 Please consider and score each of the following themes in relation to **Water Use**

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Environmental							
Agricultural							
Forestry							
Rural Water							
Industrial							
Other (please specify)							

2.20 Please consider and score each of the following themes in relation to **Water quality/ecology**

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Ecological status (WFD)							
Chemical status (WFD)							
Indicators and monitoring							
Potability							
Human health							
Endangered species							
Other (please specify)							

2.21 Please consider and score each of the following themes in relation to **Water availability**

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Water scarcity and drought							
Flood risk management							
Effects of and adaption to climate change							
Other (please specify)							

2.22 Please consider and score each of the following themes in relation to **Water technology**

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Conveying and distribution							
Desalination							
Industrial water treatment							
Urban water treatment							
Irrigation							
Efficiency and energy							
Reutilization							
Waste disposal							
Smart technologies							
Other (please specify)							

2.23 Please consider and score each of the following themes in relation to **Water management**

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Planning and management of water resources							
River basin management (WFD)							
Agricultural water management							
Wastewater management/ sanitation							
Coastal/transitional zones management							
Other (please specify)							

2.24 Please consider and score each of the following themes in relation to **Economic use of water resources**

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Hydro-power							
Transport							
Fishing							
River beaches, recreation, etc							
Other (please specify)							

2.25 pressures on Water related issues in the Danube Region

Theme	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Pollution from point sources							
Pollution from diffuse sources							
Emerging pollutants							
Reduction of river continuity							
Alien species							
Water flow regulation /morphological alterations							
Water extraction							
Other (please specify)							

Section 3: BUSINESS PRIORITIES

The challenges and opportunities for sustainable business development

Companies both impact and depend on ecosystems directly and indirectly. Therefore ecosystem degradation, loss of biodiversity and ecosystem services – the resources and processes that are supplied by natural ecosystems – has important implications for the long-term, and in some cases short-term, viability of businesses.

3.1 Please indicate the priorities in the following issues related to ecosystem changes in the Danube region companies should take into account in their risk management :

Issues	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Economic losses from growing scarcity of water or other goods delivered by nature							
Stringent Regulations/Permit conditions for businesses (water discharges, noise emissions near protected areas) and the need to take mitigating or compensating measures.							
Reputational risks from concerns about impacts of business in the ecosystem as public awareness on biodiversity/ ecosystems grows.							
Dependency of relations with financial institutions/investors due to the way businesses/clients deal with biodiversity and ecosystem services.							
Other (please add)							

3.2 Biodiversity/ ecosystems are affected by many pressures throughout the business value chain and at different scales. Which of the following impacts on the Danube ecosystem related to business activities in the region do you consider relevant:

Impacts	High Relevancy (7) to Low (1)						
	7	6	5	4	3	2	1
Air pollution. ("acid rain" caused by sulphur dioxide (SO2) emissions, enhancement of vegetation caused by excessive nitrogen emissions (NOX, NHX, etc.).							
Climate change (caused by greenhouse gas emissions CO2, CH4, or other drivers)							
Water pollution (nutrients loading leading to eutrophication, hazardous substances)							
Land use changes (Decline/Fragmentation of semi-natural agricultural areas and grasslands)							
Over-exploitation of water resources, (i.e. groundwater use leading to desiccation of habitats)							
Invasive alien species out -competing and displacing native species.							
Other (please add)							

3.3. Please indicate if you believe that businesses in the Danube region will suffer net economic losses or may eventually see a net gain from proposed market market and policy incentives such as the Europe 2020 Roadmap?

Net Economic Losses	
Net Economic Gain	
Do not know	

3.4. is a generally accepted and applied concept in environmental impact assessment. In future business projects in the Danube region, provide priorities of the following mitigation/environmental impact assessment phases for which businesses should rely on the inputs provided by scientific experts and/or basic or applied research.

Impact assessment phase	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Avoidance : Measures to avoid creating impact from the outset, such as careful spatial or temporal placement of elements of infrastructure, in order to completely avoid impacts on certain components of biodiversity)							
Mitigation : Measures taken to reduce the duration, intensity and/or extent of impacts (including direct, indirect and cumulative impacts, as appropriate) that cannot be completely avoided							
Rehabilitation/Restoration: Measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/or minimised							
Biodiversity offsets : Measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken							
Other (please add)							

3.5. Future trends in Danube Ecosystem Changes and their Risks and Benefits for businesses :

Business risks and opportunities associated with biodiversity and ecosystem services are growing. It is likely that biodiversity-related risks will become more acute and more widespread across all sectors, as biodiversity rises up on the environmental and public policy agenda.

Please rank the following business risks relevant for current and future businesses activities in the Danube region.

Business risks	High (7) to Low (1)						
	7	6	5	4	3	2	1
Natural resource depletion of raw materials and biological resources such as fresh water, fertile soils timber, fish. Trend exacerbated by pollution, climate change and spread of invasive alien species.							
Continued expansion of protected areas and consequences on business operations, on operating costs for businesses relying on access to, or conversion of, land/marine areas.							
Improved Scientific Information : Advances in the monitoring of natural resources will facilitate increased scrutiny by external stakeholders of business uses and impacts on ecosystems/biodiversity.							
Environmental policy : a) Unforeseen regulatory change and increasing regulatory burden on business to reduce adverse impacts on biodiversity, with governments applying the "polluter pays" principle more widely and stringently.							
b) Compliance costs and "green" taxes on carbon, water, land and other natural resources : consequences on business costs.							
Climate Change : Dramatic alteration of the availability of ecosystem services upon which all businesses rely due to changing temperatures, increased extreme weather events, sea-level rise, increased water stress and drought.							
Rise of responsible finance : Restricted access or increased costs of finance for companies which have adverse impacts on biodiversity/ ecosystems , or cannot show that they are taking appropriate actions to avoid, mitigate or compensate for such impacts.							
Other (please add)							

3.6. Please rank the following business opportunities for current and future activities in the Danube region.

Business opportunities	High (7) to Low (1)						
	7	6	5	4	3	2	1
Natural resource depletion : Resource efficiency/ business competitiveness. Increasing scarcity of natural resources and resulting price increases should stimulate investment in resource-conserving and substitute Technologies							
Continued expansion of protected areas : a) Businesses able to generate the same output from a smaller land or sea 'footprint' will outperform their peers, where protected areas constrain access							
b) Favourable treatment in obtaining permits for access to natural resources by regulators due to a good track record of environmental stewardship and support for protected areas.							
Improved Scientific Information : Earlier acquisitions of high value resources, ecosystem service agreements and/or operating licences for companies that use improved ecological information.							

Environmental policy : a) Prompt/Early preparation for permit processes when expanding activities for companies aware of their ecosystem/biodiversity dependancies.							
b) Involvement in shaping future regulations may benefit business and improve stakeholder relations.							
c) New revenue opportunities and/or more flexible and less costly mitigation of impacts due to increased reliance of policy makers on market-based environmental policy, such as payments for ecosystem services.							
Climate Change : a) Development of business services and tools to evaluate risks associated with climate change (e.g. climate risk mapping) or development of climate adaptation services.							
b) Participation in emerging markets for bio-carbon offsets.							
Rise of responsible finance : Competitive advantage in access to financing due to demonstrable positive impacts on biodiversity/ ecosystems.							
Other (please add)							

Section 4: EDUCATIONAL PRIORITIES

The educational requirements required to meet the societal challenges

4.1. Which other education/training activities do you consider important, other than formal educational programs leading to undergraduate/graduate degrees.

Education/training activities Activity	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1
Exchange Programmes for student							
for teacher							
Training workshops							
Commercial courses							
Short courses (summer/winter schools)							
Other (Please add)							

Partnerships between educational institutions provide a way to combine research and teaching expertise, improve the quality of studies offered to students and ultimately lead to scientific knowledge advancement. The following Questions explore aspects of such partnerships.

4.2 Indicate the relative importance of educational institution partnerships (pan-European) in the Danube Region?

Top Priority ❑	Medium Priority ❑	Low Priority ❑	Not important ❑

4.3 Please indicate the priority locations for institutions participating in educational partnerships.

Location	High Priority (7) to Low (1)						
	7	6	5	4	3	2	1

Danube region institution							
Other European institutions							
Other international (non-European) institutions.							

4.4. In developing joint educational programs for the Danube-Black Sea Macrosystem which in your opinion should be the priorities in terms of degrees/certificates offered.

Programme	Rank
Joint Undergraduate Programs	
Joint Masters Programmes	
Joint Ph.D. programmes	
Short and highly specialized Joint executive Certificate programs	
Other (Please Add)	

4.5 Joint educational programmes should give priority to preparing students for a career in:

Subject	Rank
Pure/Applied Research	
Environmental / Ecosystem/ Natural Resource Management	
Policy /Government/ International Organizations	
Industry	
Environmental planning	
Law and Policy (Regulation	
Other (Please Add):	

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