



APROBAT
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CAIET SARCINI pentru achiziția de servicii de cercetare științifică

DENUMIREA TEMEI: Servicii de cercetare științifică privind "Interdependențele dintre utilizarea terenului (acoperirea cu vegetație) și efectele negative precum eroziunea, inundațiile, compactarea solului, scurgerile de suprafață, apariția speciilor de plante invazive și poluarea apei, în bazinul hidrografic al râului Negru, în contextul schimbărilor climatice"

NECESITATEA TEMEI

Activitățile de utilizare a terenurilor cum ar fi: agricultura, gestionarea pășunilor, silvicultura, urbanizarea, precum și acoperirea cu vegetație a terenurilor au influențe mari asupra regimului apelor și a resurselor de apă din zonele de captare ale râurilor, atât din punct de vedere calitativ cât și cantitativ. Astfel, în funcție de intensitatea sau metoda de cultivare și utilizare a terenului-respectiv, în funcție de procentul de acoperire cu o vegetație adecvată, adaptată amplasamentului (de-a lungul râurilor sau torenților, în zona captărilor de apă) - gradul de eroziune, compactare a solului, inundațiile, scurgerile de suprafață și poluarea apei pot fi semnificative .

Din cauza tendințelor incerte în ceea ce privește schimbările climatice și consecințele acestora în viitor, interdependențele dintre utilizarea terenurilor, acoperirea cu vegetație a acestora și diferitele tipuri de resurse de apă sunt dificil de prezis și ar putea spori problemele actuale prin extinderea fenomenului de secetă, evenimente de precipitații puternice și expansiunea speciilor de plante invazive.

De aceea, managementul integrat al bazinelor hidrografice, în ceea ce privește resursele de apă și riscul de inundații, în contextul schimbărilor climatice este, în prezent, una dintre provocările cele mai importante.

Proiectul CAMARO-D are ca **obiectiv general** inițierea unei acțiuni concertate, avansate în zona bazinului Dunării, pentru elaborarea unui "Plan de utilizare a terenului inovativ, transnațional, în zonele de captare a apei din bazinul Dunării". Scopul acestuia este de a contribui la **protecția durabilă a resurselor de apă și îmbunătățirea prevenirii riscului de inundații prin stimularea cooperării transnaționale și trans-sectoriale între principalii factori interesați**, implicați în proiect și menținerea acestei cooperări și după finalizarea proiectului.

În proiectul CAMARO-D sunt implicați parteneri din diferite zone geografice precum și din domenii științifice și guvernamentale cu responsabilități diferite. Astfel, consorțiul proiectului este format din 22 de instituții și autorități publice cu responsabilități în domeniul protecției mediului, gospodăririi apelor, gospodăririi pădurilor, meteorologiei, institute de cercetare și de educație din țările din bazinul Dunării (Austria, Germania, Slovenia, Ungaria, Bulgaria, Croația, Cehia, Serbia), organisme cu responsabilități la nivel local, regional și național

Alte obiective ale proiectului sunt:

- îmbunătățirea managementului utilizării terenurilor în zonele de captare în scopul reducerii scurgerilor apelor pe versanți, compactării solului și a poluării.
- protejarea resurselor de apă împotriva impactului negativ al utilizării terenurilor și a schimbărilor climatice (procesele de eroziune laterală, mâl, aflux de lemn, moloz, extinderea speciilor invazive).

Pentru atingerea acestor obiective s-au format **3 cluster pilot** care vor derula acțiuni în aria proiectului și vor testa metode de bune practici în gestionarea utilizării durabile a terenurilor.

Conform aplicației proiectului CAMARO-D, Pachetul de lucru nr. 4 (WP4), Activitatea 4.1. – pregătirea acțiunilor pilot a clusterelor, APM Covasna face parte din clusterul nr. 3 care trebuie să analizeze interdependențele dintre utilizarea terenului / acoperirea cu vegetație de-a lungul râurilor și efectele negative care pot apărea datorită unei gestionări necorespunzătoare a terenurilor, precum eroziunea, inundațiile, compactarea solului, scurgerile de suprafață, apariția speciilor de plante invazive și poluarea apei.

APM Covasna și Administrația Națională de Meteorologie vor colabora pentru realizarea unui studiu pilot în bazinul hidrografic al râului Negru, fiind sprijiniți și de partenerii de proiect din Ungaria (PP5 –Institutul Herman Otto). **Pentru elaborarea studiului sunt necesare și servicii de cercetare în zona pilot privind interdependențele dintre utilizarea terenului (acoperirea cu vegetație) și efectele negative precum eroziunea, inundațiile, compactarea solului, scurgerile de suprafață, apariția speciilor de plante invazive și poluarea apei, în bazinul hidrografic al râului Negru.** Rezultatele cercetării și a studiului pilot vor sta la baza elaborării de către parteneriatul proiectului a ”Ghidului pentru regiunea Dunării pentru planificarea durabilă a utilizării terenurilor” și a ”Planului transnațional de dezvoltare a utilizării terenurilor” care sunt rezultatele finale principale ale proiectului CAMARO-D.

Acțiunile ce vor fi întreprinse în zona pilot vor contribui la atingerea obiectivelor proiectului CAMARO-D. Toate acțiunile directe (acțiunile pilot) și cele indirecte (evaluarea și promovarea celor mai bune practici), în zona pilot, au ca scop identificarea celor mai bune soluții care să conducă la adaptările necesare ale conceptelor de management pentru asigurarea unei protecții durabile a resurselor de apă.

OBIECTIVUL GENERAL AL CONTRACTULUI DE ACHIZIȚIE

Servicii de cercetare în zona pilot privind interdependențele dintre utilizarea terenului (acoperirea cu vegetație) și efectele negative precum eroziunea, inundațiile, compactarea solului, scurgerile de suprafață, apariția speciilor de plante invazive și poluarea apei, în bazinul hidrografic al râului Negru, în perioada noiembrie 2017 – 31 ianuarie 2019.

OBIECTIVE SPECIFICE

Serviciile de cercetare au ca scop elaborarea unei lucrări în limbile română și engleză care va atinge următoarelor obiective specifice:

- cuantificarea caracteristicilor bazinului hidrografic al râului Negru (lungime, debit mediu, suprafața bazinului hidrografic și suprafața inclusă în situri Natura 2000, altitudinea medie, temperatura medie, suma medie a precipitațiilor)
- evaluarea stării actuale a râului (calitatea apei, cantitatea); determinări în puncte de monitorizare stabilite de-a lungul râului Negru
- cartarea utilizării terenurilor de-a lungul râului Negru (agricultură, păduri, așezări, pășuni, zone umede) – serviciu efectuat în colaborare cu Institutul Herman Otto din Ungaria, parteneri CAMARO-D
- caracterizarea texturii solului
- evaluarea concentrației de clorofilă
- evaluarea conținutului de nutrienți

- bilanțul apei în bazinul râului Negru, inclusiv evaluarea caracteristicilor de habitat specifice componentelor biodiversității
- proiectarea și implementarea modelelor eco-hidrologice: modelarea parametrilor de calitate a apei la ieșirea din bazin cât și la confluențele râului Negru cu afluenții acestuia;
- colaborarea cu Administrația Națională de Meteorologie, partener CAMARO-D, care proiectează scenarii climatice pentru regiune, pentru două perioade viitoare (2021-2050 și 2071-2100) cu management neschimbat, pentru integrarea acestora în analiza finală;
- colaborarea cu Institutul Herman Otto din Ungaria pentru testarea unor scenarii de schimbare a utilizării și managementului terenurilor în scopul reducerii aportului de nutrienți din surse punctiforme și difuze în bazinul hidrografic al râului Negru;
- analiza impactului combinat al schimbărilor climatice și al utilizării terenurilor asupra cantității și calității apei pentru a selecta măsuri adecvate de adaptare la schimbările climatice (se vor analiza vulnerabilitățile identificate la nivelul proiectului – vezi anexa 1).
- diseminarea informațiilor privind modul de elaborare și conținutul studiului în cadrul workshopurilor și întâlnirilor cu factorii interesați, organizate în cadrul proiectului CAMARO-D

Activitățile de cercetare pe care prestatorul le va implementa (în colaborare cu partenerii din echipa de implementare) vor include și deplasări în teren în vederea colectării datelor și informațiilor specifice.

REZULTATE AȘTEPTATE

Finalitatea activităților de cercetare va consta în elaborarea unei lucrări ”*Evaluarea impactului posibil al condițiilor de schimbare climatică și de utilizare a terenurilor asupra cantității și calității apei din râul Negru prin aplicarea scenariilor climatice și a modelelor hidrologice de curgere a apei*”.

ETAPELE DE IMPLEMENTARE

1. Pregătirea acțiunilor în zona pilot (noiembrie 2017- decembrie 2017)

- Prezentarea metodologiei de lucru în zona Pilot a Bazinului Râului Negru;
- Descrierea și documentarea acțiunilor în zona pilot bazinul hidrografic al Râului Negru

2. Punerea în aplicare a acțiunilor în zona pilot (decembrie 2017- septembrie 2018)

- Studiu științific – evaluarea stării actuale, cartare și monitorizare în zona pilot, testarea scenariilor, analiza și sintetizarea măsurilor adecvate
- Identificare de bune practici de management din aria proiectului și implementarea unei practici în zona pilot
- Informare/conștientizare factori interesați în legătură cu acțiunile desfășurate în zona pilot

3. Lecții învățate și viziunile care rezultă (iulie 2018 - ianuarie 2019)

- elaborare raport de evaluare a activităților desfășurate în zona pilot punând accentul pe feedbackul și procesul de învățare al părților interesate, incluzând lecțiile învățate în contextul comunicării, dezbaterii și punerii în aplicare a celei mai bune practici.

CAPACITATEA TEHNICĂ ȘI/SAU PROFESIONALĂ

Având în vedere faptul că prezentul contract are ca obiect prestații intelectuale care presupun activități cu nivel de complexitate ridicată (situație în care calitatea personalului are un impact semnificativ asupra executării contractului) experiența profesională reprezintă caracteristici ale ofertei, ce descriu, în fapt, nivelul tehnic al acesteia.

Obiectul contractului fiind *“Servicii de cercetare în zona pilot privind interdependențele dintre utilizarea terenului (acoperirea cu vegetație) și efectele negative precum eroziunea, inundațiile, compactarea solului, scurgerile de suprafață, apariția speciilor de plante invazive și poluarea apei, în bazinul hidrografic al râului Negru”*, condițiile minime calitative impuse ofertantului sunt următoarele:

- 1 expert în Ecologie și Protecția mediului, cu expertiza în implementarea modelelor matematice eco-hidrologice, implicat într-un proiect similar în care a îndeplinit același tip de activități ca cele pe care urmează să le îndeplinească în contract;
- 1 expert GIS, modelarea matematică a proceselor hidrologice, implicat într-un proiect similar în care a îndeplinit același tip de activități ca cele pe care urmează să le îndeplinească în contract.

Prin proiect similar se înțelege: Studii de fezabilitate, Proiecte de cercetare fundamentala și aplicata, Planuri de management pentru arii naturale protejate realizate de către ofertant.

Documentele prin care ofertantul poate demonstra îndeplinirea condițiilor calitative sunt copii diplome studii superioare/atestate și contracte de muncă/colaborare/prestări-servicii precum și CV-uri datate, semnate în original, anexate pentru fiecare persoană, însoțite de declarații de disponibilitate.

Ofertantul va trebui să facă dovada deținerii capacității tehnice și/sau profesionale a experților propuși în realizarea contractului astfel:

- pentru fiecare expert propus în realizarea contractului – minim 5 ani experiență generală;
- pentru fiecare expert propus în realizarea contractului – minim 3 ani experiență specifică în proiecte similare în care a îndeplinit același tip de activități ca cele pe care urmează să le îndeplinească în contract.

MODUL DE PREZENTARE AL OFERTEI

Oferta va cuprinde următoarele documente:

- Scrisoare de înaintare (F1)
- Documente de calificare:
 - Declarație privind neîncadrarea în prevederile art. 164 din L98-2016 (F2)
 - Declarație privind neîncadrarea în prevederile art. 165 din L98-2016 (F3)
 - Declarație privind neîncadrarea în prevederile art. 167 din L98-2016 (F4)
 - Declarație privind neîncadrarea în prevederile conflictului de interese (F5)
 - Declarație privind principalele servicii prestate în ultimii 3 ani (F6)

-Documente privind capacitatea de exercitare a activității și capacitatea profesională a ofertantului

- Propunerea tehnică

- Propunere financiară (F7)

Ofertantul depune oferta elaborată în conformitate cu informațiile și cerințele prevăzute în documentele achiziției, însoțită de documentele care demonstrează îndeplinirea criteriilor de calificare stabilite de autoritatea contractantă.

Evaluarea ofertelor: Punctajul maxim acordat pentru ofertă = 100 puncte

A. Ponderea factorului de evaluare Prețul ofertei = $P_{\text{financiar}} = 30 \%$

B. Ponderea factorului de evaluare Experiența experților-cheie = $P_{\text{tehnic}} = 70 \%$

Punctajul de evaluare al experienței experților cheie:

- Experiență mai mare sau egală cu trei ani: $P_{\text{tehnic}} = 70$ puncte
- Experiență între 2 și trei ani: $P_{\text{tehnic}} = 50$ puncte
- Experiență între unul și doi ani: $P_{\text{tehnic}} = 30$ puncte
- Experiență mai mică de un an: $P_{\text{tehnic}} = 10$ puncte

Oferta câștigătoare:

Ofertele vor fi clasificate în ordinea descrescătoare a punctajului total, calculat conform formulei:

$$P_{\text{total}} = P_{\text{financiar}} + P_{\text{tehnic}}$$

Oferta cu valoarea P_{total} cea mai mare va fi declarată câștigătoare.

Comisia de evaluare va prezenta punctajul în funcție de factorul de evaluare stabilit pentru fiecare oferta care a îndeplinit criteriile de selecție.

Punctajul va fi însoțit de o fișă de punctaj, în care se va prezenta clar justificarea acordării punctajelor.

Rezultatele impuse prin caietul de sarcini sunt obligatorii, acestea trebuind să se regăsească în propunerea tehnică, astfel încât aceasta să fie conformă.

În cazul când vor exista limitări, condiționări sau restricții impuse de ofertant la cerințele caietului de sarcini, oferta va fi declarată ca fiind neconformă.

CERINȚE DE RAPORTARE/DECONTARE

Prestatorul va furniza, în cadrul contractului, rapoarte de activitate periodice, după desfășurarea acțiunilor și atingerea obiectivelor specifice menționate în prezentul caiet de sarcini, în vederea decontării cheltuielilor. Rapoartele trebuie să includă următoarele:

- evaluarea succesului și constrângerilor majore pentru fiecare activitate și sarcină.
- utilizarea forței de muncă.
- imagini foto în format electronic care să reflecte activitatea desfășurată în teren

Rapoartele vor avea o pagină inițială ce va include elementele de identitate vizuală ale Programului Transnational Dunărea și proiectului CAMARO-D, numele contractului, codul contractului sau referințe, titlul raportului, data emiterii și perioada acoperită, numele și adresa operatorului.

Transmiterea și aprobarea rapoartelor

Raportul trebuie depus spre aprobare managerului de proiect din cadrul APM Covasna, care este responsabil cu aprobarea acestor documente, în format electronic și pe suport de hârtie.

Limba de redactare a rapoartelor intermediare este limba română. Raportul și studiul final vor fi prezentate și în limba engleză.

Plățile vor fi efectuate după aprobarea fiecărui raport.

Managerul de proiect va informa Prestatorul, în scris, despre orice solicitări de clarificare/decizii.

DISPOZIȚII FINALE

Atribuirea contractului de servicii – “Servicii de cercetare în zona pilot privind interdependențele dintre utilizarea terenului (acoperirea cu vegetație) și efectele negative precum eroziunea, inundațiile, compactarea solului, scurgerile de suprafață, apariția speciilor de plante invazive și poluarea apei, în bazinul hidrografic al râului Negru” se va face după următorul criteriu de atribuire: Cel mai bun raport calitate/preț.

Ofertanții trebuie să examineze cu grijă toate instrucțiunile, termenele și specificațiile conținute în documentația de atribuire.

Depunerea de oferte incomplete sau întârzierea depunerii acestora se face pe propriul risc, acestea ducând la respingerea ofertei.

Prestatorul este responsabil de prestarea la timp a obligațiilor asumate prin ofertă și de calitatea tuturor cerințelor stabilite în documentația de atribuire, respectând și aplicând cele mai bune practici în domeniu.

Prestatorul va informa de urgență Beneficiarul despre orice eveniment sau circumstanțe ce pot împiedica îndeplinirea la timp și cu eficiență a obiectului achiziției.

Prestatorul va asigura personal calificat corespunzător pentru a duce la bun sfârșit sarcinile cerute în documentația de atribuire.

Condiții contractuale specifice:

Începând cu data încheierii contractului, toate drepturile de autor asupra materialelor elaborate/transmise pe parcursul derulării contractului revin AGENȚIEI PENTRU PROTECȚIA MEDIULUI COVASNA.

întocmit

Manager de proiect

Ileana Luminița Bălălău

ANEXA 1

Vulnerabilități și riscuri identificate în zona pilot, bazinul hidrografic al râului Negru

Interdependencies between land use and vegetation cover along rivers & water reservoirs – erosion, floods, soil compaction, surface runoff, invasive plant species and water pollution			
Vegetation cover / Land use	Status	Vulnerability	Intervention pilot area
Forest	<ul style="list-style-type: none"> -Inadequate timber yield techniques, like tractor-skidding -Inadequate timber harvest techniques (it should be made in strips parallel to the level curves and not on an integral slope) - Transportation techniques effect on small streams - Unprotected (open land) runoff-intensive areas with steep slopes - Use of not specialized technique 	<p>During forest maintenance (mostly harvesting) forest roads are exposed to enormous load, what causes accelerated erosion, sediment transport, water pollution and high concentrated surface runoff</p> <ul style="list-style-type: none"> - loss of biodiversity, soil degradation 	<ul style="list-style-type: none"> -Awareness of main stakeholders regarding the best management practices identified by CAMARO-D project partners; - Involvement of main stakeholders in CAMARO-D workshops, trainings, round tables.
Alpine pasture			There are no alpine pasture in pilot area
Grassland	<ul style="list-style-type: none"> -intensive grazing, - drainage of water contaminated from inadequate storage or application of manure on arable land intensive manure management and use of fertilizers - Inadequate grassland management (not constantly maintenance and operation of the grassland) 	Loss of biodiversity, soil compaction, erosion, water pollution	<ul style="list-style-type: none"> -Awareness of main stakeholders regarding the best management practices identified by CAMARO-D project partners; - Involvement of main stakeholders in CAMARO-D workshops, trainings, round tables.
Nature protected areas/wetland areas (Two Nature 2000 Sites in the Black River basin – beaver is one of the protected species)	<ul style="list-style-type: none"> - Overlapping of the trained minor basins of rivers and streams with the protected areas limits - Uncontrolled development of protected species which damage the river banks and causes serious problems and obstacles at river channels - Camp sites located near protected areas or areas with valuable nature 	Floods, erosion, loss of biodiversity, soil compaction ,invasive plant species, land degradation, loss of natural succession, water pollution	<ul style="list-style-type: none"> - research activities to determine the characteristics of the River Black Hydrographical basin, current state of the river (water quality, quantity) ; land use along the river; eco-hydrological models: climate scenarios - inventory of castor habitats (dams) - identifying best management practices

	<p>resources are often without proper sewage and drainage system</p> <ul style="list-style-type: none"> - Improper wetland and other riverine habitats management and restoration - Drainage systems in grassland areas (former wetland areas) 		<p>from CAMARO-D area to settle conflicts between land users involved in agriculture, forestry and water management and the strictly protected beaver in areas occupied by both parties. (Ex. Castor Management Plan)</p> <ul style="list-style-type: none"> -implementing the most appropriate best practice to improve negative impacts on land and hydro-technical flood defense works - recommendation for legal requirements for proper beaver management -awareness of main stakeholders regarding the best management practices identified by CAMARO-D project partners; - involvement of main stakeholders in CAMARO-D workshops, trainings, round tables - field visit with students
<p>Arable land</p>	<p>Intensive agriculture, intensive and inappropriate manure application, heavy machinery</p> <ul style="list-style-type: none"> -Cultivation of arable land with no buffer zones along water courses -Fertilization with mineral fertilizers mainly -Improperly used fertilizers cause diffuse water pollution - Low landscape fragmentation (mean single parcel size (ha)) 	<p>Erosion, soil compaction, surface runoff</p>	<ul style="list-style-type: none"> -Awareness of main stakeholders regarding the best management practices identified by CAMARO-D project partners; necessity for soil analysis in order to be able to correct the quantities of fertilizer used in crops; the use of agro-soil measures to reduce soil erosion on the slopes; extension of irrigation surfaces that have the effect of changing the microclimate; implementation of modern technologies for land preparation, insemination, crop

			<p>maintenance and exploitation; crop rotation is crucial for keeping land happy and healthy. This allows organic matter to build up, making future plantings more fertile;</p> <p>- Involvement of main stakeholders in CAMARO-D workshops, trainings, round tables.</p>
Invasive plant species	<p>Along the Black River, there are places where were identified <i>Amorpha fruticosa</i> and <i>Fallopia japonica</i>.</p>	<p>Land degradation, loss of natural succession, suppression of native plants</p>	<p>-field observations</p>
Settlement area	<p>-not all settlements are covered with sewage systems</p> <p>- development of areas with a high share of sealed (impermeable) surfaces</p> <p>-satellite settlements</p> <p>-settlement and infrastructure development in flood hazard areas</p> <p>- missing storm water systems on roads</p> <p>-low coordination of various activities within spatial planning</p> <p>-inappropriate land use near water sources</p> <p>-incomplete waste water treatment plants</p> <p>-uncleaning of river sections and gullies from vegetation and waste</p>	<p>Water pollution, soil compactation, loss of soil retention capacity, floods</p>	<p>-inventory of water consumers and identification of waste water discharge points</p> <p>-implementation of forecasting, warning and alarm systems for flood events;</p> <p>-awareness of main stakeholders regarding the best management practices identified by CAMARO-D project partners; avoiding to construct houses and social, cultural and/or economic buildings in potentially floodable areas, with the presentation of data on the effects of previous floods in urban planning documentation;</p> <p>adapting future developments to flood risk conditions.</p> <p>- Involvement of main stakeholders in CAMARO-D workshops, trainings, round tables.</p>

RISKS

Erosion

Relevant types of erosion, risk potentials and hot spots

Black River

The effects of soil erosion go beyond the loss of fertile land. It has led to increased pollution and sedimentation in streams and rivers, clogging these waterways and causing declines in fish and other species. And degraded lands are also often less able to hold onto water, which can worsen flooding.

Soil erosion in the pilot area is divided into: surface erosion (when the removal surface is homogeneous, on large surfaces and the same horizon thickness) and deep erosion (when soil removal is concentrated on certain pathways).

Erosion commonly occurs following conversion of natural vegetation to agricultural land – carrying away fertile soil as well as fertilizers, pesticides and other agrochemicals.

When land is worked through crops or other agricultural processes, it reduces the overall structure of the soil, in addition to reducing the levels of organic matter, making it more susceptible to the effects of rain and water. Tilling in particular, because it often breaks up and softens the structure of soil, can be a major contributor to erosion. Farming practices that reduce this activity tend to have far less issues with soil erosion.

Deforestation is another cause for soil erosion. Without plant cover, erosion can occur and sweep the land into rivers. The agricultural plants that often replace the trees cannot hold onto the soil and many of these plants, such as soybean and wheat, can actually worsen soil erosion. And as land loses its fertile soil, agricultural producers move on, clear more forest and continue the cycle of soil loss.

Also, overgrazing can be a factor for erosion. The conversion of natural ecosystems to pasture land doesn't damage the land initially as much as crop production, but this change in usage can lead to high rates of erosion and loss of topsoil and nutrients. Overgrazing can reduce ground cover, enabling erosion and compaction of the land by wind and rain. This reduces the ability for plants to grow and water to penetrate, which harms soil microbes and results in serious erosion of the land.

Pesticides and other chemicals used on crop plants have helped farmers to increase yields. But the overuse of some of these chemicals changes soil composition and disrupts the balance of microorganisms in the soil. This stimulates the growth of harmful bacteria at the expense of beneficial kinds.

The most common type of erosion in the Black River pilot area is the riverside erosion due to a strong meander moving by the river. Riverside erosion also affects the stability of the dams which requires technical measures to take by the Water Management System.

Legal basics, responsibilities (structures of competences), data management, funds

Black River

- 2006/0086 (COD) Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC;
- Council Regulation (EC) No 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers;
- Ministry of Agriculture, Food and Forests, the National report on the implementation of the United Nations Convention to combat Desertification (UNCD) in Romania, Bucharest, 2002.
- Law no. 18/1991 (** republished **) on land fund
- Emergency Ordinance no. 38 of 21 March 2002 (* updated *) on

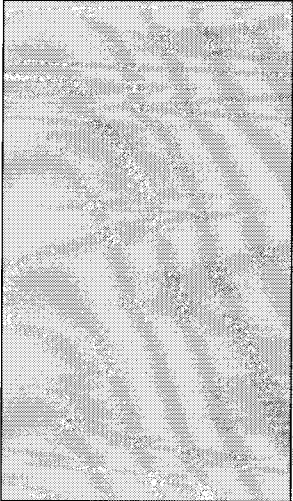
	<p>the elaboration and financing of pedological and agrochemical studies and the financing of the National Soil-Field Monitoring System for agriculture as well as soil-forest vegetation for forestry.</p> <p>The necessary works for the protection and improvement of the soil are established on the basis of studies and projects, elaborated on request by specialized research and design organisms, correlated with the land development plans, and are executed by the owners of the lands, or by units specialized in the execution of such works appointed by the owners.</p> <p>The State supports partially or totally the carrying out of soil protection and improvement works, supporting the expenditures within the approved budget allocation, based on the fundamentation notes elaborated by the research and design units, approved by the County Agricultural Directorates and approved by the Ministry Agriculture and Rural Development.</p> <p>The County Pedological and Agrochemical Offices, the Research Institute for Pedology and Agrochemistry Bucharest and the Institute of Forestry Research and Development, at the request of the Ministry of Agriculture and Rural Development, execute the pedological and agrochemical studies directly and carry out the monitoring system for agricultural land on: ground units, inventory of soil resources, land favorability for agricultural or forestry crops, suitability for use, pollution, land restrictions for different uses and appropriate agro-epidemiological and anti-erosion measures, irrespective of the form of exploitation or property.</p> <p>The Water Management Systems are responsible for the evaluation of the erosions along the rivers and makes the necessary intervention, by itself and by own funds, when there are minor problems or by specialized companies at major problems.</p>
<p>Risk governance: risk management, communication and information (e.g. disaster operation plan, other instruments & documentation tools)</p>	<p>There are Disaster operation plans elaborated at local (for each locality) and regional level (for each river basin). The plans are activated when information regarding the risks is coming from the National Meteorological Administration. These plans contain the precise intervention schemes and the responsibilities for every person or organization involved.</p>
<p>Practical Implementation a) risk prevention b) immediate actions in course of events c) long term monitoring and quality assurance Who, Where, When</p>	<p>Black River</p> <p>Due to the negative effects of human activities on soil, it is also society that needs to take measures to stop or mitigate these negative impacts through a series of techniques:</p> <ul style="list-style-type: none"> • Restoration of the vegetal cover: either by planting vegetation deliberately or by stopping fires and grazing to allow vegetation to reinstall; • Leak control using plants (through terraces, application of humus, transversal plowing in the direction of the plant, maintenance of narrow vegetation strips, etc.); • Plenty of crop rotation is crucial for keeping land happy and healthy. This allows organic matter to build up, making future plantings more fertile; • Because tilling activity breaks up the structure of soil, doing less tilling with fewer passes will preserve more of the crucial topsoil; • Eliminating all deforestation is not possible. Parts of the landscape will need to be reshaped and altered as populations grow and change—but this can be balanced through sustainable forest management, reforestation efforts and maintaining the integrity of protected areas;

	<ul style="list-style-type: none"> • Measures to stop erosion of white banks; • Preventing erosion caused by agricultural roads, lots, etc. (by their intelligent location, surface water sewerage, vegetation planting, etc.); • Stopping wind erosion (by keeping soil moisture, by placing a vegetation that diminishes wind action, etc.); • Sustainable land use can help to reduce the impacts of agriculture and livestock, preventing soil degradation and erosion and the loss of valuable land to desertification. <p>Risk prevention begins with the exact mapping of each river and identifying the potential hot spots / places where, in a case of a disaster, losses of life or material damages can occur. The responsibilities and the precise intervention scheme is included in the Disaster operation plan.</p> <p>The long term monitoring is provided by the Water Management System who also cares about the water quality assurance.</p>
<p>Trainings, awareness raising activities</p>	<p><i>Black River</i></p> <p>A major factor for preventing soil erosion is educating more and more people who work with the land on why it is a concern, and what they can do to help reduce it. This means outreach to farmers in susceptible areas for ways that they can help protect crops from inclement weather, or ways that they can help make sure their soil remains compact without restricting their plant growing activities.</p> <p>Periodically training sessions on a local or regional level are organised to improve the intervention quality and speed in a case of a disaster. These sessions are publicised in local newspapers to share these information along the citizens and implicated organisations.</p>
<p>Additional Information</p>	<p>Inadequate land use leads to increasing erosion along the river banks. Deforestation in the upper side of the Black river causes heavy forms of erosion. Trees on the river banks contribute to the stability of the bank and decrease erosion.</p>

Floods	
<p>Risk potentials and hot spots</p>	<p>Black River</p> <p>Key factors in determining the risk potentials are:</p> <ul style="list-style-type: none"> • analysis of physiographic features; • assessment of availability of data necessary for applying the hazard determination method; • the presence of potentially endangered sites. <p>The risk potentials and hot spots along the river are also identified by the Water Management Systems through their own employees or by the citizens themselves.</p>
<p>Legal basics, responsibilities (structures of competences), data management, funds</p>	<p>Black River</p> <ul style="list-style-type: none"> • Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks; According to the directive, Member States have the obligation to identify river basins and coastal areas at risk of flooding, to draw up risk maps for floods and to develop flood risk management plans for those areas. Risk maps for the Black River area are available at: http://gis2.rowater.ro:8989/flood/ • The Water Law 107/1996 as subsequently amended and supplemented; • Government Decision no 1212 of 29 November 2000 on the approval of the Regulation on the organization and functioning of the basin committees; • Law 575/2001 on the National Territory Arrangement Plan - Section V - Natural Hazard Areas; • Government Emergency Ordinance no 21/2004 on the National Emergency Situation Management System, approved by Law 15/2005, amended and supplemented by the Government Emergency Ordinance (GEO) no. 1/2014 on certain measures in the area of emergency situation management; • Government Decision (GD) no 557/2016 on risk type management was adopted. According to these normative acts, the institutions have defined the obligation to draw up sectoral plans to provide specific emergency situations management. The coordination of the whole process is ensured by the National Committee for Special Emergency Situations (NCSES). • Ministerial Order no. 1422/2012 for the approval of the Regulation on the management of flood emergency situations, dangerous meteorological phenomena, hydro technical accident, accidental pollution on the watercourses and marine pollution in the coastal area; • Government Decision no 1854/2005 for the approval of the short-term national flood risk management strategy; • Government Decision no 1309/2005 approving the Program for the implementation of the National Plan for Prevention, Protection and Mitigation of Floods and their Financing; • Government Decision no 447/2003 for the approval of the methodological norms regarding the elaboration and content of the natural risk maps for landslides and floods; • Government Decision no 1286/2004 on the approval of the General Plan of Preventive Measures to Avoid and Reduce the Effects of Floods. <p>The National Emergency Situations Management System represents a</p>

	<p>permanent communication network between public administration authorities and the organizations qualified for emergency management, established by levels and fields of competence, and which have the infrastructure and resources necessary for reducing casualties and response in case of different types of emergency situations.</p> <p>The National System is composed of:</p> <ul style="list-style-type: none"> - Emergency situations committees (at national, ministerial, Bucharest Municipality, county and local level); - The General Inspectorate for Emergency Situations (as integrator – ensures the transmission of the decisions taken by the Government or by the National Committee towards the local and central public administration authorities); - Professional community public services for emergency situations (County Inspectorates for Emergency Situations) and Volunteer emergency services according with GEO no. 21/2004; - Operational centers for emergency situations (permanent or temporary - are established within ministries and other institutions within the system, in order to ensure the flow of information before or at the time of an emergency); - On-site commander (ensures the unitary coordination at the place where the exceptional event has occurred); - In order to manage emergency situations, GIES and the county structures fulfill the mission of: monitoring, evaluation and response to emergency situations; - Information and preventive education and warning of the population, notification to government authorities about the possibility/imminence of emergency situations; search and rescue, extrication of persons; evacuation of endangered people, population and property by ensuring evacuation measures, installing victim camps, participation in public transportation and of certain categories of goods.
<p>Risk governance: risk management, communication and information (e.g. disaster operation plan, other instruments & documentation tools)</p>	<p>Black River</p> <ul style="list-style-type: none"> ● Real-time data collection, validation and creation of back-up systems for operative information; ● Detecting the possibility of flash floods and floods; ● Prognosis of the evolution and the propagation of floods along the watercourses; ● Warning the authorities and the population of the extent, severity and timing of the floods; ● The organization and response of authorities and population for emergencies; ● Provision of resources (material, financial, human) at county level for operative intervention; ● Activating operational institutions, mobilizing resources, etc. ● Disaster operation plans are elaborated at local level (for each locality) and regional level (for each river basin). The plans are activated when warnings are coming from the National Meteorological Administration. These plans contain the precise intervention schemes and the responsibilities for every person or organization involved.

<p>Practical Implementation a) risk prevention b) immediate actions in course of events c) long term monitoring and quality assurance Who, Where, When</p>	<p>Black River</p> <ul style="list-style-type: none"> • Avoiding to construct houses and social, cultural and/or economic buildings in potentially floodable areas, with the presentation of data on the effects of previous floods in urban planning documentation; adapting future developments to flood risk conditions; • The implementation of structural protection measures (dams, dikes, large water dams, bank consolidation, wetlands, etc.); • Non-structural measures (controlling the use of minor river beds, developing basin flood risk reduction plans and measures programs, introducing insurance systems, alert/alert systems, informing the public, etc.); • The detailed identification and the geographical delimitation of the natural flood risk areas from within the territorial-administrative unit, the inclusion of these areas in the general urban plans and the provision in the local urban planning regulations of the specific measures regarding flood prevention and mitigation, land use and construction building; • Promoting adequate land use practices with regard to agricultural and forestry land, such as: avoiding soil degradation and especially slopes; increasing the forest area in torrential catchment areas; afforestation of degraded land; the establishment of forestry shelter belts, torrent correction, and the application of best agricultural practices; • The implementation of forecasting, warning and alarm systems for flood events; • maintenance of existing watercourses and flood protection facilities; • The execution of protection works against riverbeds scouring in the area of existing bridges and underpasses; • Communicating with the population and educating them on flood risk and how to act in emergency situations.
<p>Trainings, awareness raising activities</p>	<p>Black River</p> <p>It is the personal responsibility of anyone who lives and works in the area of potential significant flood risk, to adapt all his activities to flood risks. This requires communication to citizens in an appropriate and understandable way on flood risks and on opportunities how they can adapt to the natural circumstances. The awareness raising measures include presentation of flood hazard and flood risk maps, flood risk management plans (including natural water retention measures and associated consequences to adaptive land use) and of emergency plans to public, organizing training campaigns and other educational activities focussing on flood preparedness among municipalities, introduction of water management issues into schools (from the elementary school to the university level) and increase of participation of population in the flood management and emergency response works. Involvement of public media is very helpful especially by producing flood leaflets, films or TV broadcasts. An essential issue for both flood resilience and awareness raising is making available of effective insurance policies and financial precautions.</p>
<p>Additional Information</p>	<p>In Romania, the risk management organizational system comprises of a series of institutions from the central, the territorial (decentralized) and local public administration. Their institutional capacity and resources are important due to the imminence of certain types of emergencies which have a repetitive pattern in Romania and an important impact on the people, the environment and the socio-political stability. The system has been created to ensure an effective management of any type of emergency situation and, also, to cover the obligations Romania has as part of international treaties and agreements, especially as a Member State of the</p>



European Union, which includes a European risk prevention system, considering the cross-border nature of contemporary risks.

The focal point of the entire reform process is the Ministry of Internal Affairs and its subordinated structure, the General Inspectorate for Emergency Situations (GIES – In Romanian: IGSU - Inspectoratul General pentru Situații de Urgență) under the Department for Emergency Situation. The Ministry of Internal Affairs develops the main public policies on emergency situations, as well as the assessment centralization and risk management generated in legislation under the responsibility of other line ministries. A number of these line ministries fulfill support functions in emergency situations management: Ministry of Regional Development and Public Administration, Ministry of Environment and Climate Change, Ministry of Agriculture and Rural Development, Ministry of Health, Ministry of Economy.

Soil compaction + Soil quality	
<p>Risk potentials and hot spots</p>	<p>Black River</p> <p>The soil's ability to withstand corrosive weather conditions (eg wind, rain, run-off) depends mainly on the soil texture and organic matter content, which influences the soil's ability to retain water, and its ability to Produces aggregates or crusts. When erosion takes place, the loss of surface layer causes the soil fertility to decrease contaminates the aquatic ecosystem.</p> <p>The loss of soil fertility and decomposition of the structure eventually lead to desertification.</p> <p>The compaction of the soil can cause or accelerate other soil degradation processes, such as erosion or landslides. Compaction reduces the infiltration rate, which results in increased scaling on sloping surfaces. Also, the presence of a low permeability layer makes the layer superior soil is more prone to saturation with water and hence more difficult. This upper layer presents the risk of landslides.</p>
<p>Legal basics, responsibilities (structures of competences), data management, funds</p>	<p>Black River</p> <p>Order no. 619/2015 for the approval of the eligibility criteria, the specific conditions and the way of implementation of the payment schemes provided for in art. 1 paragraph (2) and (3) of Government Emergency Ordinance no. 3/2015 for the approval of the payment schemes that apply in agriculture in the period 2015-2020 and for the modification of art. 2 of Law no. 36/1991 on agricultural companies and other forms of association in agriculture, as well as the specific conditions for implementation for the compensatory rural development measures applicable on agricultural lands, stipulated in the National Program for Rural Development 2014-2020.</p> <p>Law no. 18/1991 (** republished **) on land fund</p> <p>Emergency Ordinance no. 38/2002 (* updated *) on the elaboration and financing of pedological and agrochemical studies and the financing of the National Soil-Field Monitoring System for agriculture as well as soil-forest vegetation for forestry.</p> <p>There is a National program for monitoring the land and soil for agriculture, implemented by the Ministry for Agriculture and Rural Development (Government Decision 8/2009), through the Offices for Pedological and Agro-chemical Studies (OSPA), distributed across the country.</p> <p>OSPA-s make researches, maintain the database with the soils and the land uses.</p>
<p>Risk governance: risk management, communication and information (e.g. disaster operation plan, other instruments & documentation tools)</p>	<p>Black River</p> <p>In principle, it is desirable to apply a management of degraded agricultural land through:</p> <ul style="list-style-type: none"> • re-cultivation with traditional grass species and application of counter-erosion measures; • Introduction of water-saving and energy-saving irrigation technologies; • Enhancing the storage and utilization of natural fertilizers, including through low-carbon practices; • Financial incentives for farmers for soil cultivation and for the use of modern production equipment and technologies. <p>In the pilot area, the risk for soil compaction is not high. There are no disaster operation plans or other instruments & documentation developed.</p>

<p>Practical Implementation</p> <p>a) risk prevention b) immediate actions in course of events c) long term monitoring and quality assurance</p> <p>Who, Where, When</p>	<p>Black River</p> <p>This attention was due to the fact that this process of soil compaction is a problem multidisciplinary interact soil / machine / plant, with consequences both on the development of agriculture and the wider economy and environment protection.</p> <p>Relevant enterprises should strengthen internal administration, incorporate prevention and control of soil pollution into their environmental risk prevention and control systems, construct and operate pollution treatment facilities pursuant to laws and regulations, and ensure that emission of key pollutants is consistently up to standard. In the event that soil pollution is caused, the enterprise should assume legal liability for the assessment, control and remediation of the damage.</p> <p>When soil compactation occurs, locally, isolated, the landowner take the measures to destroy the compacted layer of soil, by scarification (picks)</p>
<p>Trainings, awareness raising activities</p>	<p>Black River</p> <p>In Romania are organized training sessions in the agriculture field, including focusing on soil compaction.</p> <p>- Regular training of APIA staff at central, county (regional) and local level, which has attributions in the FEADR implementation</p>
<p>Additional Information</p>	<p>Black River</p> <p>The Code of Action for Reducing the Impact of Climate Change in Agriculture</p> <p>National Strategy for Rural Development 2014-2020</p> <p>Axis 2: Improving the environment and the countryside in order to promote a sustainable management of agricultural lands and forests</p> <p>Priority 1: Biodiversity conservation</p> <p>Priority 2: Protection and sustainable management of natural resources</p> <p>Priority 3: Mitigation of green house gas emissions and combating climate changes</p> <p>Measures: Agro – environment payments; Natura 2000 payments for agricultural land; Afforestation of agricultural lands; Afforestation of non-agricultural lands; Natura 2000 payments for forest; development and increased use of renewable energy sources, including biofuels from agriculture and production of biomass from forestry as well as increasing the level of conformity with EU standards for zootechnical farms (mitigation of ammonia emissions)</p>

Surface runoff	
Risk potentials and hot spots	<p>Black River</p> <p>Generally, the risk of runoff is greatest when poor soil structure is near the soil surface. Soil structure deteriorates when structural units are deformed producing a dense single mass of soil (or large soil units). This occurs when pressure is applied to a wet and soft soil.</p> <p>Inadequate land use leads to an increasing erosion along the river banks. Deforestation along the upper side of the Black river decreases the hold up capacity of the catchment area, this can lead to a fast water flow and ultimately to an increasing flood risk. Trees on the river banks contribute to the stability of the bank and decrease erosion.</p> <p>A high speed surface runoff causes a higher soil and river erosion that leads to an increasing flood risk.</p>
Legal basics, responsibilities (structures of competences), data management, funds	<p>Black River</p> <p>Some legislative regulations concerning of surface runoff are set in following:</p> <ul style="list-style-type: none"> • Water Law no. 107/1996. • OM MMGA/MAPDR nr. 296/216/2005 (MO nr. 529/22.06.2005) on the approval of the Technical Action Framework Program for the elaboration of action programs in areas vulnerable to nitrate pollution from agricultural sources <p>The Water Management Systems have the responsibility to determine the heaviness of the surface runoff hotspots along the rivers but, because of property issues, these measures can't be done.</p>
Risk governance: risk management, communication and information (e.g. disaster operation plan, other instruments & documentation tools)	<p>Black River</p> <p>An uncontrolled surface runoff is the main cause of flash floods which are very hard to predict and prevent. There are Disaster operation plans elaborated for every town, local and regional level and on the Olt river basin, the plans are activated by the information given by the National Meteorological Administration and they contains the precise intervention schemes and the responsibilities for every implicated person or organization. The instruments and risk documentation are included in the Disaster operation plans.</p> <p>The Water Management Systems have limited authority for the areas outside their competence zone, so that surface runoff on private properties can be very little prevented.</p>
Practical Implementation a) risk prevention b) immediate actions in course of events c) long term monitoring and quality assurance Who, Where, When	<p>Black River</p> <p>Agricultural lands within catchment areas impact the emergence of flood events through their surface run-off waters. If cultivation has been properly adapted, the fields are able to contribute to flood prevention (only up to a certain amount). Agricultural land also may serve directly as flood plains, with the extent of related damages depending on the land's flood sensitivity.</p> <p>Coordination across the catchment is important when implementing runoff control measures. Runoff may pass through several properties and cross several roads (sometimes railway lines) as it passes from the most remote part of a catchment to a major drainage line or creek.</p> <p>Risk prevention begins with the exact mapping of each river and identifying the potential hot spots / places where in a case of a disaster can occurs losses of life or material damages. The responsibilities and the precise intervention scheme is included in the Disaster operation plan.</p>
Trainings, awareness raising activities	

**Additional
Information**

Invasive plant species	
Species, risk potentials (based on species) and hot spots	Along the Black River there are places where were identified <i>Amorpha fruticosa</i> plants and <i>Fallopia japonica</i> .
Legal basics, responsibilities (structures of competences), data management, funds	ORDER no. 979/2009 on the introduction of alohtonic species, interventions on invasive species, as well as the reintroduction of native species listed in annexes no. 4A and 4B to Government Emergency Ordinance no. 57/2007 on the regime of natural protected areas, the conservation of natural habitats, wild flora and fauna, on the national territory EMERGENCY ORDINANCE no. 57/2007 (* updated *) on the regime of protected natural areas, conservation of natural habitats, wild flora and fauna The Ministry of Environment is the administrative authority designated for the application of the provisions of Regulation (EU) no. 1.143 / 2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species.
Risk governance: risk management, communication and information (e.g. disaster operation plan, other instruments & documentation tools)	
Practical Implementation a) risk prevention b) immediate actions in course of events c) long term monitoring and quality assurance Who, Where, When	
Trainings, awareness raising activities	Low information and awareness
Additional Information	

Water pollution	
Legal basics, funds and resources	<p>-Water Law 107/1996 with the following amendments is the main legislative instrument which transpose the provisions of the Water Framework Directive 2000/60/EC and of the Floods Directive 2007/60/EC.</p> <p>-Decision. 188/2002 for approving the rules on conditions for discharge into the aquatic environment of the waste water, modified and completed</p> <p>-EMERGENCY ORDINANCE no. 195 of 22 December 2005 (* updated *) on environmental protection</p> <p>It is to be implemented a strategy to give farmers some funds/rewards to use their lands in protected zones along the river in a certain way that prevents the pollution of the groundwater and surface water. Refunds for the farmers to not use chemical fertilizers can increase the ground and surface water quality.</p>
Risk potentials and hot spots	<p>Lack of wastewater treatment and uncontrolled waste water discharge can lead to water pollution</p> <p>Uncontrolled use of chemical fertilizers can cause groundwater pollution mainly by the components phosphorus and nitrogen; this can also affect the surface water and can lead to eutrophication.</p> <p>Hot spots of pollution sources and potential polluters are identified in the process of water use regulation or by field inspections.</p>
Risk governance: risk management, communication and information	<p>Ministry of Waters and Forests is the central authority responsible for water resources management.</p> <p>National Administration "Romanian Waters" (NARW) is the national implementation authority under Ministry of Waters and Forests</p> <ul style="list-style-type: none"> •11 river basins are managed by the National Administration "Romanian Waters" through its units –Water Basin Directorates. On each Water Basin Directorate are subordinated structures organised at county level, referred to as Water Management Systems (41 WMS). <p>Main tasks of River Basin Administration:</p> <ul style="list-style-type: none"> •Water resources management •Integrated water monitoring •Administration of hydraulic structures •Water protection against pollution and over use •Flood control management •Coordination of national investments in water resources field •Implementation of the EU Directives related to the water •Application of international and bilateral water conventions <p>Every authorised consumer of water must have their own Pollution Prevention Plan and must act like it is provided in the Plan.</p> <p>Also every local authority / company must have their own Plan and use it in case of an emergency / accidental pollution.</p> <p>The Water Management Systems have their plans that have to be followed in case of emergencies/risks .</p>

<p>Practical Implementation a) risk prevention b) immediate actions in course of events Who,Where,When</p>	<p>The Water Management Systems do the monitoring of the quality of the ground and surface water and when a sign of possible pollution is given then measures are taken to identify the cause and to limit the impact. Possible sources of pollution are mapped and introduced in the Water Pollution Prevention Plan.</p> <p>The instruments and risk documentation are included in the Water Pollution Prevention Plan.</p> <p>When pollution occurs the authorised consumer of water must immediately alert the Water Management System and take the proper actions to stop the pollution and prevent damages to the water; these actions are included in the Water Pollution Prevention Plan.</p> <p>Not taking the necessary action or not alerting the Water Management System lead to penalties.</p> <p>The long term monitoring is provided by the Water Management System who also cares about the quality assurance.</p>
<p>Trainings, awareness activities raising</p>	<p>Periodically training sessions on a local or regional level are organised to improve the intervention quality and speed in a case of an accidental pollution. These sessions are advertised in the local newspapers, to share these information along the citizens and involved organisations.</p>
<p>Additional information</p>	

Surface and groundwater interaction	
Legal basics, funds and resources	<p>Black River</p> <p>Some legislative regulations concerning of surface runoff are set in following:</p> <ul style="list-style-type: none"> • Water Law no. 107/1996. • OM MMGA/MAPDR nr. 296/216/2005 (MO nr. 529/22.06.2005) on the approval of the Technical Action Framework Program for the elaboration of action programs in areas vulnerable to nitrate pollution from agricultural sources
Risk potentials and hot spots	<p>Black River</p> <p>Generally, the risk of runoff is greatest when poor soil structure is near the soil surface. Soil structure deteriorates when structural units are deformed producing a dense single mass of soil (or large soil units). This occurs when pressure is applied to a wet and soft soil.</p>
Risk governance: risk management, communication and information	<p>Black River</p> <p>An uncontrolled surface runoff is the main cause of flash floods which are very hard to predict and prevent . There are Disaster operation plans elaborated for every town, local and regional level and on the Olt river basin, the plans are activated by the informations given by the National Meteorological Administration and they contains the precise intervention schemes and the responsibilities for every implicated person or organization.</p>
<p>Practical Implementation</p> <p>a) risk prevention</p> <p>b) immediate actions in course of events</p> <p>Who,Where,When</p>	<p>Black River</p> <p>Agricultural lands within catchment areas impact the emergence of flood events through their surface run-off waters. If cultivation has been properly adapted, the fields are able to contribute to flood prevention (only up to a certain amount). Agricultural land also may serve directly as flood plains, with the extent of related damages depending on the land's flood sensitivity.</p> <p>Coordination across the catchment is important when implementing runoff control measures. Runoff may pass through several properties and cross several roads (sometimes railway lines) as it passes from the most remote part of a catchment to a major drainage line or creek.</p> <p>Risk prevention begins with the exact mapping of each river and identifying the potential hot spots / places where in a case of a disaster can occurs losses of life or material damages.</p> <p>The responsibilities and the precise intervention scheme is included in the Disaster operation plan.</p>
Long-term monitoring, prevention and quality assurance	<p>Black River</p> <p>Generally, the adaptation measures involve introducing water-saving irrigation measures, soil and water conservation, genetic and plant breeding measures, new agricultural practices, etc.</p> <p>The most important recommended adaptation measures are:</p> <ul style="list-style-type: none"> - application of organic fertilizers (manure, sideration), cultivation of legumes for enrichment of the soil, etc. - afforestation of the sloping terrain, implementation in practice of new irrigation techniques which enable efficient use of water, etc. - control of the salt-rich groundwater level by reducing the quantity of surface and ground water, drainage of micro-depressions in the valleys, etc.
Trainings, awareness raising activities	