

Joint project Final Conference

June 3rd to 4th, 2019

Austrian Ministry for
Sustainability and Tourism

Stubenring 1

Vienna, Austria

D.C.4.2 - Proceedings:
Agenda
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Projects co-funded by European
Union funds (ERDF, IPA)

TAKING
COOPERATION
FORWARD

PROGRAMME
FINAL CONFERENCE
June 3rd & 4th 2019, Vienna, Austria

Monday, 3 June 2019

09:00 – 09:30 **Registration**

09:30 – 10:00 **Conference Opening – Welcome Addresses**

10:00 – 11:00 **Session 01 – Projects and pilots**

Presentations and
discussion

Presentation of the projects **PROLINE-CE** and **CAMARO-D: objectives and synergies**

Hubert Siegel (Federal Ministry of Sustainability and Tourism, Forest Department, Vienna, AT – Lead Partner)

PROLINE-CE: Action plan for adaptation of existing land use and flood/drought management practices

Barbara Čenčur Curk (University of Ljubljana, Faculty of Natural Sciences and Engineering, Ljubljana, SI)

CAMARO-D: Transnational synthesis report of the unified assessment of the Danube Basin areas

Renate Mayer (Agricultural Research and Education Center Raumberg-Gumpenstein, Raumberg, AT)

11:00 – 11:30 **Coffee Break**



11:30 – 13:00

Session 02 – Main Outputs

Presentations and
discussion

PROLINE-CE: GOWARE – CE: Transnational Guide towards an Optimal Water REGime
Guido Rianna (Euro-Mediterranean Centre on Climate Change Foundation, IT)

PROLINE-CE: The way to DriFLU Charta - a commitment towards an optimized and effective land use management for drinking water protection
Elisabeth Gerhardt (Federal Research and Training Centre for Forests, Natural Hazards and Landscape, Vienna, AT)

CAMARO-D: GUIDR: Guidance for sustainable land use planning
Prvoslav Marjanović (Water Institute Jaroslav Černi, Belgrade, RS)

CAMARO-D: LUDP: Transnational Land Use Development Planning
Albena Bobeva (Executive Forest Agency, Sofia, BG)

13:00 – 14:30

Lunch



14:30 – 16:00

Panel Discussion PROLINE-CE and CAMARO-D

Challenges in solving conflicts of interest between land use and water management - Protection of (drinking) water resources and mitigation of flood risk through the implementation of innovative practices in land use and water management

Panelists

Clemens Neuhold (*Federal Ministry of Sustainability and Tourism, Vienna, AT, Section I/10 – Flood Risk Management*)

Floods Directive

Matjaz Glavan (*University of Ljubljana, Biotechnical faculty, Ljubljana, SI*)
Agricultural practices for protecting drinking water sources

Edith Hödl (*International Commission for the Protection of the Danube River, ICPDR*)

River Basin Management

Walter Seher (*BOKU – University of Natural Resources and Life Sciences, Vienna, AT, Institute of Spatial Planning, Environmental Planning and Land Rearrangement, IRUB*)

Spatial planning

Georg Rappold (*Federal Ministry of Sustainability and Tourism, Vienna, AT, Forest Department*)

Forest and water

Moderation

Stefan Kollarits, PRISMA solutions, Mödling, AT

Tuesday, 4 June 2019

11:00 – 12:30

Official signing event

Round Table discussion

Challenges and integration of land use and (drinking) water management



**DriFLU (Drinking Water/
Floods/Land use) Charta**



**LUDP (land use
development plan concept)**

12:30 – 14:00

Lunch

15:00 – 16:30

Guided tour through Belvedere Castle



Panel discussion on 04/06/2019

One of the main goals was to gain decisive inputs to necessary follow-up activities (D.T 4.3.3) and an improved cooperation for innovative practices of land use management also after project lifetime.

The key-note speakers were selected according to their expert-knowledge, coming from different fields of action (flood risk management, agriculture, water management & soil protection, spatial planning, forestry, water supply, ICPDR) and moderated by an expert.

The topic, which was discussed, was: challenges in solving conflicts of interest between land use and water management – Protection of (drinking) water resources and mitigation of flood risk through the implementation of innovative practices in land use and water management.

The panellists provided insights into the upcoming amendments of EU Directives – like Water Framework and Floods Directive:

The focus of the new **Floods Directive** will be laid on an integrated, cross-sectoral approach with accompanying benefits, for example reducing flood risks combined with an increasing ecological state. The consideration of spatial planning, especially on catchment-scale, and public participation will play a more important role in the future.

ICPDR (International Commission for the Protection of the Danube River) is a good example for a transnational broad approach (also including Non-EU member states) facilitating the implementation of the Water Framework and Floods Directive by means of coordinated RBMPs (River Basin Management plans) and Flood risk management plans.

Panel discussion on 04/06/2019

Until end of 2020 the 3rd cycle of the RBMPs and the 2nd cycle of Flood risk management plans have to be developed. The cooperation with other sectors – like hydropower, navigation and agriculture – is fostered. For agriculture an adequate guidance document will be prepared. Due to increasing water scarcity and droughts in the future also climate change adaptation issues will be considered.

Forests play an important role regarding drinking water protection as 75% are coming from forested areas. Therefore a target-oriented management is very important. Further efforts have to be laid on the coordination of different interests (e.g. the Austrian Forest dialogue) and on climate change related issues. The main task of the project consortium will be the dissemination of the project outcomes and the awareness raising especially of decision makers.

Concerning **spatial planning** the still existing challenge is the harmonization of different interests within the same space: which type of land use will get the priority? The competition between urbanised and open areas will continue. Therefore the damage potential due to floods will increase, if the sealing is further on the rise. Intersectoral coordination – like in Austria the ÖROK (the Austrian Conference on Spatial Planning) – is very important.

Besides, the focus should be laid on the coordination at regional level (e.g. voluntary cooperation) as decisions on local level have regional impacts. The international coordination is fostered by the implementation of the Water Framework Directive.

Panel discussion on 04/06/2019

The Slovenian agrarian expert explained the positive influence of EU Directives (e.g. Nitrate Directive) on **agriculture**. Due to subsidies for the farmers the application of pesticides and fertilisers decreased, especially within drinking water protection zones (DWPZs). Nevertheless existing rules should be enlarged to wider areas around the inner zones of DWPZs as nutrients cover long distances from their spreading-point. Also in the new CAP (Common Agricultural Policy) nutrients will play an important role. Important for the future will be the knowledge-transfer to the involved stakeholders (farmers, decision makers) and the exchange with other countries (e.g. regarding karstic research).

The main outcomes of PROLINE-CE should be integrated in the new RBMPs and Flood risk management plans and in existing platforms, e.g. ICPDR. Additionally it was stated by the experts, that a kind of “focal point” with the main outcomes of INTERREG projects would be very helpful.

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Round table on 04/06/2019

Prior to the signing procedure on June 4th, a round table discussion with the title **“Challenges and integration of land use and (drinking) water management”** was organized, lead by Primoz Banovec of the University of Ljubljana.

The participants presented interesting statements and their points of view concerning the above mentioned challenges and the benefits in view of the project outcomes.

Special thanks to the participants:

Mr. Johannes Schima / Forest Department of the Austrian Ministry of Sustainability and Tourism

Mr. Kuschnig / Vienna Water

Mr. Grambow / Bavarian State Ministry, Director General for Section V, Water Management and Soil Protection

Mr. Konstantin Ivanov / Regional Coordinator Global Water Partnership



PROGRAMME FINAL CONFERENCE

June 3rd & 4th 2019, Vienna, Austria



Plenum on June 3rd with almost 120 participants



Welcoming words by the Lead-Partner of both projects CAMARO-D and PROLINE-CE, together with moderator of panel discussion



Panel discussion

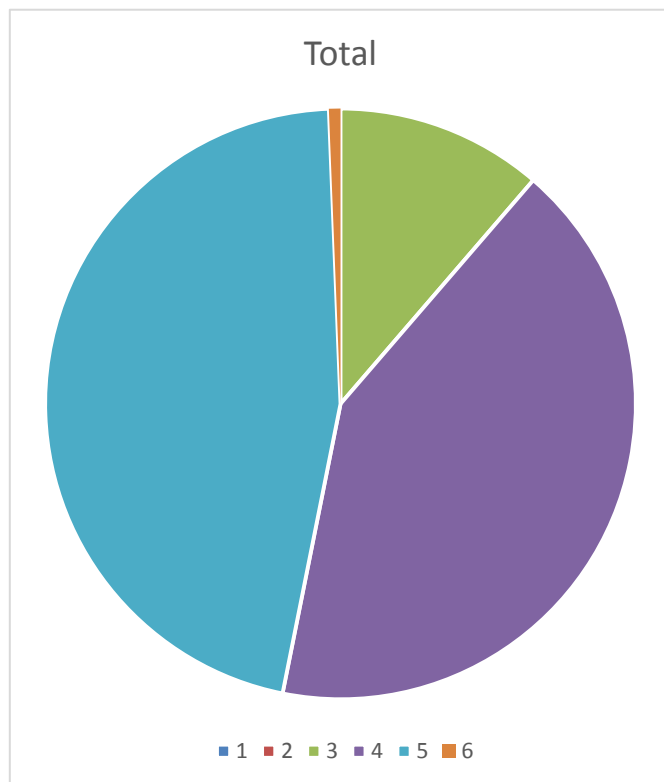
Moderated round table before the signing procedure



PROGRAMME
FINAL CONFERENCE
June 3rd & 4th 2019, Vienna, Austria

As foreseen in the AF, a feedback questionnaire was distributed and evaluated:
about half of the participants filled in the questionnaire, the evaluation showed that around 86% ticked 5 or 4, concerning the quality of the event.

Evaluation:



For more information on the projects, please visit the project websites:

www.interreg-central.eu/proline-ce








www.interreg-danube.eu/camaro-d

ANNEX

Abstracts

Participant list

The abstracts can be found on the following pages:

-  01_Abstract_PROLINE-CE_CAMARO-D_2_projects_H.Siegel_BMNT.pdf
-  02_Abstract_PROLINE-CE_Action plan for adaptation of existing land use_B.Cencur_Curk_UL.pdf
-  03_Abstract_CAMARO-D_Transnational synthesis report_R.Mayer_AREC.pdf
-  04_Abstract_PROLINE-CE_GOWARE – CE_Transnational Guide towards an Optimal WATER REgime_G.Rianna_CMCC.pdf
-  05_Abstract_PROLINE-CE_The way to DriFLU Charta_E.Gerhardt_BFW.pdf
-  06_Abstract_CAMARO-D_GUIDR_Guidance for sustainable land use planning_P.Marjanovic_JCI.pdf
-  07_Abstract_CAMARO-D_LUDP_Transnational Land Use Development Planning_A.Bobeva_EFA.pdf

CAMARO-D

PROLINE-CE

TWO PROJECTS FROM DIFFERENT PROGRAMMES: A COMMON MESSAGE RELATED TO THE TASKS WATER PROTECTION AND LAND USE PLANNING

Hubert SIEGEL¹

CAMARO-D

Cooperating towards Advance **MA**nagement **RO**utines for land use impacts on the water regime in the Danube river basin

PROLINE-CE

Cooperating towards Advance **MA**nagement **RO**utines for land use impacts on the water regime in the Danube river basin

REFERENCES

www.interreg-central.eu/proline-ce

Keywords: land use management, Danube river basin, drinking water protection, flood prevention

During the last two and a half years, the Forest Department of the Austrian Federal Ministry of Sustainability and Tourism had the pleasure to act as a Lead Partner for two INTERREG projects. Running almost simultaneously, but with different focal points and also co-financed by two different INTERREG programs: PROLINE-CE is co-funded by the CENTRAL EUROPE program whereas CAMARO-D is running in the Danube Transnational Programme. In the last month of the project duration of each project, the Austrian Lead Partner, together with the project partner Vienna Water organized the Joint Final Conference.

Both projects are dealing with water related issues. This is the common basis and the main reason for a joint conference, creating synergies and enabling knowledge exchange. While the main objective of PROLINE-CE was the creation of measure bundles for an improved protection of drinking water resources, the focus of CAMARO-D was laid on the development of a catchment-based approach to improve long-term water resource protection and flood risk mitigation, mainly concentrating on land-use planning issues.

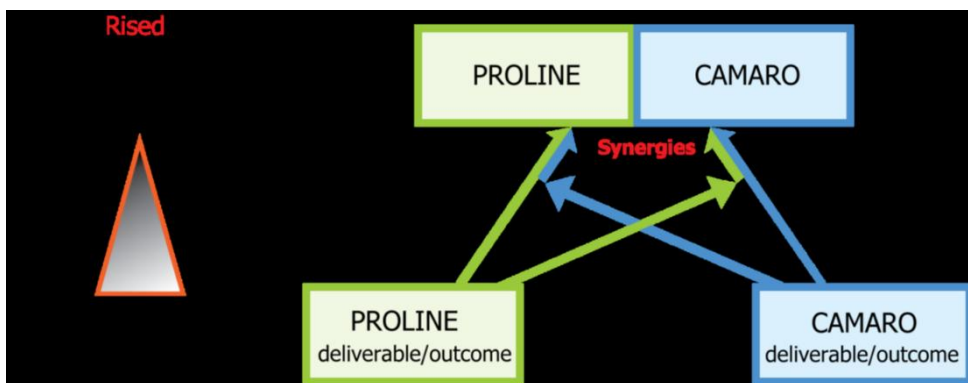
Both project consortia conducted many efforts during project lifetime, resulting in the following main outputs, some of which also an issue of testing in the projects' pilot areas:

- Best Practice manuals and catalogues for adequate land-use and water management have been created, with the aim to protect (drinking) water resources and to mitigate flood risk, considering also climate change related issues.
- Two decision support tools have been designed: GOWARE – Transnational Guide towards an optimal water regime and GUIDR – Guidance for sustainable land use planning, based on the developed best practices. Moreover, their effectiveness was evaluated by means of the involvement of affected stakeholders (water supplier, farmers, foresters, spatial planners, interest groups and governmental institutions)

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- Two strategy papers (DriFLU – Drinking Water/Floods/Land use Charta and LUDP – Land use development planning concept) were elaborated by each partnership and will be signed, focusing on prospects for action for function-oriented land use for the Central Europe area and the Danube River Basin. The overall goal is a future sustainable protection of (drinking) water resources and an improved flood management on transnational and national level.

Final Conference particularly will be dedicated to the presentations of the main outcomes of the two projects. Furthermore, future challenges in solving conflicts of interest between land use and water management will be discussed with experts coming from different field of actions and having broad experiences also on transnational level.



During the last third of project's lifetime, interaction / cooperation of both projects led to synergies of PROLINE-CE and CAMARO-D projects, producing a combined effect (increased level of knowledge and outcomes), which is greater than

the sum of their separate effects. Building of Synergies depended on the common approach:

- Focus of PROLINE-CE project:
 - protection of drinking water sources through integrated land use management
 - developed implementation strategy for harmonized environmental standards in drinking water recharge areas
 - to improve water- and soil quality and reduce flood/drought risks within these areas
- CAMARO-D project focus:
 - land use impacts on the water regime in the Danube river basin
 - setting the frame for a harmonized transnational land use management system
 - Taking into account the demands of water resources protection and flood prevention.

ACTION PLAN FOR ADAPTATION OF EXISTING LAND USE AND FLOOD/DROUGHT MANAGEMENT PRACTICES

PROLINE-CE; WORKPACKAGE T2 - PILOTS: IMPLEMENTATION AND FEEDBACK

Barbara Čenčur Curk¹, Guido Rianna², Anja Torkar³ and Urška Valenčič⁴

1.1. METHODOLOGY

Pilot Actions (PAs) were selected in each partner country in order to reflect conflicts (GAPs) of management and operation of water supply companies and land-use management in recharge/water protection areas. In PAs status of best management practices implementation was determined and in case of lacks identified, possibilities of improvement and implementation were assessed. In representative PAs, considering the different ecosystem services, implementation strategies of BMPs which are important for water protection were elaborated.

Each single PA is clustered concerning the geographic specification, natural site characteristics (type of drinking water source: surface water, groundwater, bank filtration) and main land use in three pilot action clusters (PAC): (1) Mountain forest and grassland sites, (2) Plain agriculture/ grassland/ wetland sites and (3) Special sites (riparian strips).

1.2. MAIN LAND USES IN PILOT ACTION CLUSTERS (PAC)

PAC1 - Mountain forest and grassland sites: In mountainous areas, drinking water sources are mainly originated from groundwater (fractured and karst aquifers). In PROLINE-CE project, two PAs in karstic mountainous areas could be allocated to this cluster, the major land use is forest, grassland and pastures. The main conflicts regarding drinking water protection are timber production, gaming and cattle grazing.

PAC2 - Plain agriculture/ grassland/ wetland sites: In plain sites, the main land uses are agriculture, grassland and urbanization. Drinking water sources can be surface water, bank filtered water or groundwater [mainly porous aquifer, but also karst aquifer (Croatian case)]. All PAs are in plain areas and the major land use is agriculture (with grasslands), but also urbanization.

PAC3 - Special sites (riparian strips): The main land uses are represented by agriculture and settlements. Both PAs face issues related to both water availability and water quality. Agricultural activities represent the main cause of contamination of water bodies and increase in water demand, associated to irrigation practices. Furthermore, both PAs struggle with direct and indirect impacts of flood and drought events.

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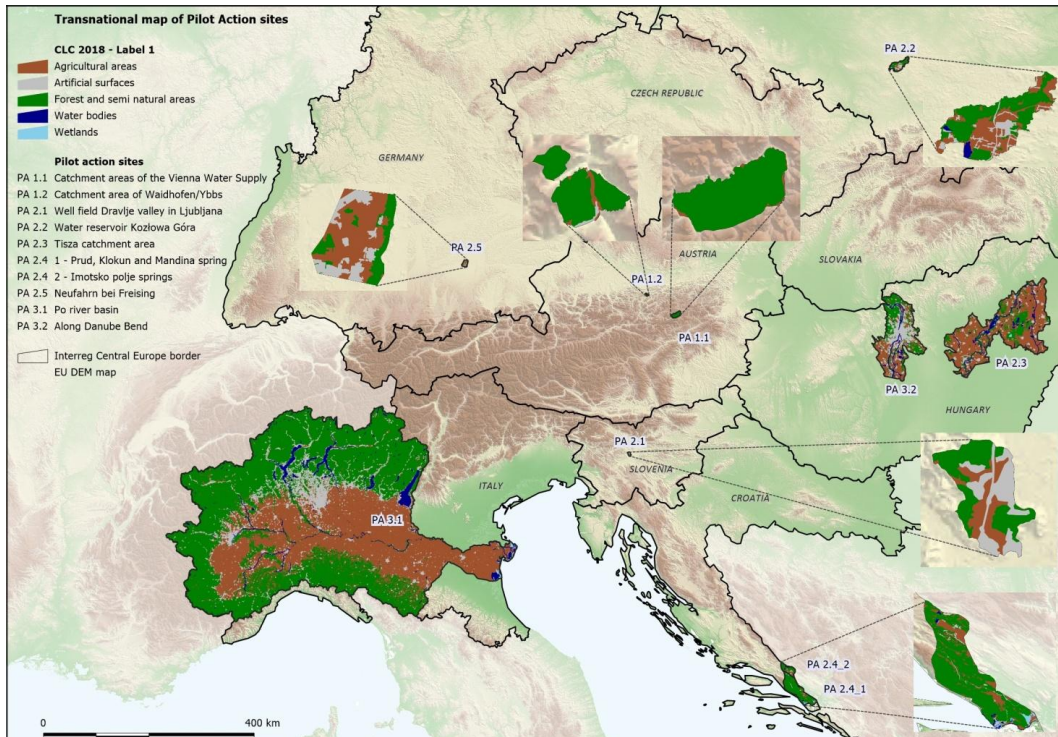


Figure 1: Transnational map of Pilot Action sites.

1.3. CLIMATE CHANGE - GENERAL OVERVIEW ON THE CENTRAL EUROPE REGION

PROLINE-CE evaluated the expected variations in weather patterns regulating water availability and occurrence/severity of water-related extreme events (droughts, floods) due to climate change. To this aim, variations in “proxies” were computed by considering the outputs of the multi-model ensemble of regional climate models, at the highest horizontal resolution available in Europe, EURO-CORDEX (≈ 12 km) (<https://euro-cordex.net/>). In Figure 2, the variations in winter precipitation (a), summer precipitation (b), summer temperature (c) and maximum yearly precipitation on a daily scale (d) are displayed as anomalies between the end of the century 2071-2100 and a reference time span 1971-2000 under “mid-way” RCP4.5 and more pessimistic but “business as usual” RCP8.5. A clear increase in temperature is recognizable over the entire domain (c); it is even more evident under more severe scenario and in Southern part of the domain. Concerning winter precipitation, an increase is assessed in Alpine Regions and surrounding areas while the opposite occurs (mainly under RCP8.5) in the southern part of the area. Finally, a clear growth in maximum daily precipitation is detectable over the entire area, again, mainly under RCP8.5 and Alpine region.

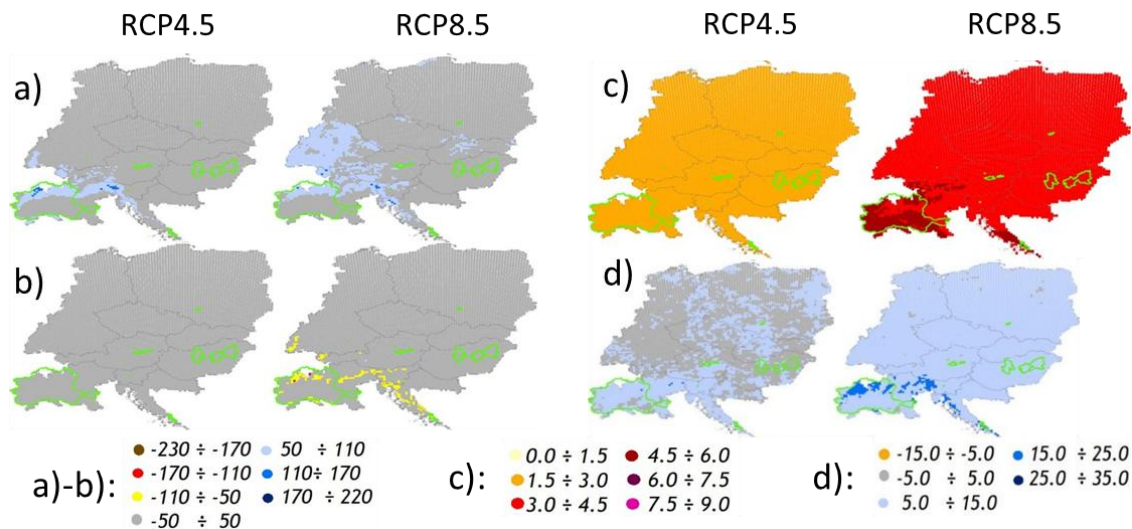


Figure 2: expected variations 2071-2100 vs 1971-2000 under RCP4.5 and RCP8.5 for: a) winter precipitation [mm/season], b) summer precipitation [mm/season], c) summer temperature [°C], d) maximum yearly precipitation on daily scale [mm/day]. Green areas represent the pilot areas.

The reported variations confirm the main remarks identified by ETC/CCA Technical Paper 2018/4 (Ramieri, 2018) for the Central Europe area with consequently a higher probability of more frequent and severe drought events, a decrease in snow and ice coverage mainly on the Alpine arc and an increase in frequency and/or intensity of floods. Of course, they can result in strong variations in water availability in terms of impacts, location and timing. In this regard, the evaluation of the EU Adaptation Strategy undertaken by the European Commission (2018) stresses the relevant role of transnational programmes in promoting cooperation projects on Climate Change Adaptation. Furthermore, this document highlights that “approaching Climate Change Adaptation (CCA) as a global public good to tackle cross border risks may reveal opportunities to strengthen international cooperation on resilience”.

1.4. IMPLEMENTATION POSSIBILITIES OF SELECTED BEST MANAGEMENT PRACTICES AND ACCEPTANCE OF BMPS AMONG STAKEHOLDERS AND EXPERTS

Testing of BMPs in the pilot areas was done in three steps: In the first step, the most important and relevant BMPs were selected. Subsequently, various activities for the implementation of BMPs were performed (step 2) and the last step was to find out the stakeholder’s opinions about the selected BMPs (step 3).

The implementation of BMPs may require:

- adaptation of existing land use management practices with the purpose of drinking water protection,
- adaptation of existing flood/drought management practices with relation to drinking water protection,
- adaptation of policy guidelines.

At the local/regional level, the implementation of best management practices demands a transdisciplinary and participatory approach with dynamic interaction and feedbacks of stakeholders and experts. Therefore, an important part of the implementation is the acceptance of best management practices for drinking water protection and flood mitigation among stakeholders and experts. This was obtained thanks to stakeholder workshops and individual discussions. By this means, stakeholders’ opinions about selected BMPs were acquired. In most cases, stakeholders supported the proposed BMPs, but mostly they are not in the position to achieve changes in the system, at least not with immediate effect.

1.5. SELECTED BEST MANAGEMENT PRACTICES IN THE PILOT ACTIONS

BMPs selected within each pilot area were categorized according to the type of land use /category each problem is related to: agricultural areas, urban areas, forest and alpine pasture. All GAPs/BMPs related to water management (general, drinking water and flood management) are actually related to all land uses. BMPs were therefore classified into the following categories: general water management (all land uses), drinking water management (all land uses), flood management (all land uses), agricultural areas, urban areas, forest and alpine pasture.

The relevant Best Management practices (BMPs) selected for particular pilot action represent the management actions which were considered to solve the problems given through the existing GAPs.

Table 1: Summary of selected best management practices.

BMPs assigned to general water management address shortage in measures, tools or information, which would be necessary for ensuring a more efficient water management.
In drinking water management BMPs offer solutions on how to manage pressure on drinking water sources (1) quantity caused by anthropogenic pressure and pipeline leakage and (2) quality caused by human activities in the recharge area (establishing of drinking water protection zones). In the Italian, Slovenian and Croatian pilot sites, also climate change was considered.
BMPs related to flood management solve the deterioration in both water quality and quantity. The most important measure proposed is hydrological/ hydraulical modelling.
In agricultural areas , BMPs mainly propose monitoring and education regarding the improper use of pesticides and/or fertilizers and improper manure storage.
BMPs generated from GAPs identified in urban areas address issues like water quality deterioration due to insufficiency or lack of sewage system and wastewater treatment, illegal waste disposal, waste disposal which does not meet environmental standards and unarranged road rainwater discharge.
BMPs assigned to forest land use mostly derive from (excessive) anthropogenic activities like: clear-cutting, forest road construction, hunting, conifer tree plantations; and have as a consequence e.g. increased surface runoff and decrease of groundwater quality and quantity.
BMPs in alpine pastures category all address grazing management for cattle on karstic alpine pastures to prevent erosion processes and groundwater pollution.

Identified BMPs within PROLINE-CE project cover different levels, some of them are legislation and governmental oriented, whereas others are very operational and based on practitioners' activities (farmers, individuals...).

14 out of 41 BMPs were already implemented, most of them (9) in general water management category and forest land use. One example is the implementation of BMPs in PA1.2 Waidhofen/Ybbs where BMPs were strategically planned through the elaboration of the "Guideline for securing the Water Protection functionality of the forest ecosystems within the DWPZ" (GWP) which defines all relevant BMPs for the watershed. GWP was resolved through the city council of Waidhofen/Ybbs and has now normative character. The second example is the setup of the multiscale monitoring of the water resources to investigate and assess water resources, sources of pollution and possible hazards in PA2.2 Kozłowa Góra. Based on the results mathematical models of hydrology and ecology of the Kozłowa Góra reservoir was established. Simulations run allowed to assess an impact of land use and water management to water quality and quantity and its ecology. A proposal for DWPZ was prepared and is being implemented. The proposal includes limitation in land use, wastewater management and fishery.

On the other hand, some BMPs are very complex and require system change or even a change of policy guidelines, which are long lasting procedures and cannot be done during the project lifetime. Moreover, implementation of BMPs is limited by economic, administrative, social acceptance or governance issues. Therefore, it is crucial to continue the stakeholder dialogues to foster the implementation of BMPs into daily practice and/or policy guidelines. Further activities should have the focus on the implementation of the proposed BMPs on the national (guidelines issued by state agencies) and local levels (e.g. BMP implemented by a public water supplier or municipality). It is therefore crucial that BMPs for drinking water protection and flood mitigation are in concordance with all stakeholders (linked to all land use activities) in the recharge area of the drinking water source.

REFERENCES

PROLINE-CE WP T2, OUTPUT REPORT:

O.T2.4 Action plan for adaptation of existing land use and flood/drought management practices

Ramieri et al. (2018) Adaptation policies and knowledge base in transnational regions in Europe ETC/CCA Technical Paper 2018/4

Interreg Central Europe Programme - PROLINE-CE web page:

<https://www.interreg-central.eu/Content.Node/PROLINE-CE.html>

PROLINE-CE web shared platform:

<http://proline-ce.fgg.uni-lj.si/>

Keywords: drinking water protection, land use management, best management practices, stakeholder involvement

TRANSNATIONAL SYNTHESIS REPORT OF THE UNIFIED ASSESSMENT OF THE DANUBE BASIN AREAS

Renate Mayer¹, Kathrin Blanzano¹, Verena Mayer¹

CAMARO-D RESEARCH AREA

The operational implementation of CAMARO-D activities was initiated and tested in pilot areas, which are spread over different partner countries. The classification into the respective clusters was based on different water types, such as groundwater resources, torrents & small rivers, rivers and accumulation lakes. The selection resulted on natural and/or administrative conditions. For the pilot areas, interdependencies with existing land use types and vegetation cover that causes specific problems and risks were examined in detail. Forests, pasture land, grassland, wetland areas (close to river banks), arable land, settlement areas, industrial/commercial areas, traffic/energy infrastructure, areas with invasive plant species, tourist areas mining areas (gravel pits) and landfill were selected. The current status was described and the vulnerability and undesirable development derived.

RISK LIST

Risks are overlapping the land use practices, therefore interactions between risk and adapted site management for risk minimization with priorities had to be clearly defined. For the relevant risks in the pilot areas, the risk potentials and hot spots, legal basics and responsibilities, data management and funds (subsidies), risk governance, practical implementation (risk prevention measures, immediate actions in course of events, long term monitoring and quality assurance and trainings) and awareness activities were described for each pilot area.



Following risks were selected in terms of:

- Water protection: water pollution, unfavourable surface water and groundwater interaction, impairment of groundwater recharge and quantity, drinking water shortage, cyanobacterial blooms and toxins in drinking water supply reservoirs
- Flood and soil protection and stabilisation: erosion, floods, surface runoff, soil compaction & deterioration of soil quality, invasive plant species, forest fires, bark beetle infestation, spread of beaver populations with associated destabilisation of flood protection measures

PILOT ACTIONS WITH STAKEHOLDERS

Pilot actions were initiated in the pilot areas to bring positive impacts on water quality and flood protection. Different stakeholder groups were involved through workshops, dialogues, awareness activities, PR activities, trainings, field days, expert groups, testing of tools and instruments and included all areas of competence depending on the scope of duties. Pilot actions, therefore, divided in direct and indirect interventions, and the learning processes of the involved stakeholders were summarised and evaluated to share and promote best practices.

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TRANSNATIONAL ADDED VALUE

Out of a huge number of best practice pilot actions, the project team selected twelve transnational best practice manuals (BPMs) for implementation. Concrete recommendations for actions have been defined in order to simplify implementation.

CLUSTER 1	CLUSTER 2	CLUSTER 3
Groundwater resources	Torrents, small rivers	Rivers, accumulation lakes
Groundwater protection through targeted silviculture	Tailored forest management in torrential watersheds	Adapted agriculture for optimal surface water and soil protection under climate change
Best practice restrictions for drinking water quality in agricultural land		Conversion from arable land to grassland mitigating soil erosion
Mountain grassland management towards groundwater protection	Practical guide to spatial planning in catchments and river stretches	
Hydropower plants and wastewater treatment	Beaver management to protect flood prevention dams	
	Hydrotechnical measures mitigating flood risks & establishing of flood forecasting maps in torrential watersheds and along rivers	
Control of invasive plant species		
Awareness raising		

The cooperation of different institutions at regional and national level is increasing and thus enables target orientated land use planning towards improved flood risk prevention and sustainable protection of water resources. The cooperation promotes blue (retention areas) and green infrastructure (nature protection areas and/or agrarian land) and involves land users as well as spatial planning bodies. The presentation and exchange of modelling results and dissemination between land managers and farmers is promoted. In addition, advisory tools and awareness raising activities will be continued in the future. The pilot actions showed very clearly that an open communication process of facts and problems in catchment areas with the relevant stakeholders leads to good, feasible solutions (also independent from guidelines and regulations). The problem awareness for sustainable land-use management is strengthened by the transparent presentation of hazard potentials and cause-effect structures.

OUTLOOK (VISIONS) FOR REGIONAL ESTABLISHMENT

In some pilot areas, cooperation processes and activities have already started and might be extended or continued, e.g. between agriculture, spatial planning and water sector). A Camaro-D platform board trello (also used as advisory board) is in progress and the establishment of a scientific association for the continuation of the networking of research, education and practice on this topic has also been realised. The state of the art management routines are improved as eco-friendly practices to strengthen environmental and climate change commitments and the cooperation between agriculture and water sector. The ICPDR position paper demands that 30 % of national allocations for rural development have to be dedicated to environmental measures as a matter of standard. The transnational BPMs can be used as an input for the design of CAP interventions to achieve the objectives of the WFD, Flood Directive and other relevant EU guidelines.

REFERENCES:

CAMARO-D (2019): Transnational Synthesis Report of the unified assessment of the Danube Basin areas
ICPDR position paper (2019): The post-2020 Common Agricultural Policy and Water Management in the Danube River Basin, Doc. Nr. IC212, final

www.interreg-danube.eu/camaro-d; www.raumberg-gumpenstein.at

Keywords: Transnational best practice management, Lessons learned, Unified assessment of Danube basin areas, Resulting visions

GOWARE-CE

TRANSNATIONAL GUIDE TOWARDS AN OPTIMAL WATER REGIME

Guido Rianna¹, Angela Rizzo² and Monia Santini³

ABSTRACT

GOWARE (transnational Guide towards Optimal Water REgime) represents the web-interactive PROLINE-CE Decision Support Tool (DST), specifically designed for selecting, prioritizing and promoting the most suitable Best Management Practices (BMPs) for the drinking water protection and flood mitigation, accounting for the specific User's requirements.

In general terms, a DST is a computerized system that supports Users in the decision-making processes by using analytical systems for the examination of multiple alternatives and for the identification of the most suitable management strategies in the different contexts it is used. In recent years, DSTs have been extensively applied in different research and practical contexts and several applications have been proposed in the field of environmental protection, water resources management and water-related risks mitigation.

As sketched out in Figure 1, GOWARE design includes two main stages:

Stage 1- Scoping the Analysis: this phase consists in defining the context that appropriately represents the issues that the User is facing in the decision-making process. According to the defined context, the most suitable BMPs are pre-selected among the entire set of available practices (Box A in Figure 1); BMPs stocktaking (about 100 BMPs) has been built recurring to support of experts (stakeholders and Project Partners) or retrieved by deep desk review. Sub-set of BMPs is identified by using four filters concerning land cover/use, topographic settings, adaptation target and time horizon of interest.

Stage 2- Criteria ranking: this phase allows the prioritization of the pre-selected BMPs, returning an order of suitability according to the User judgments about the relative importance of five criteria (Box B in Figure 1). For this purpose, GOWARE adopts the Analytic Hierarchy Process (AHP, Saaty,1980), which permits putting together quantitative scores on the BMPs criteria provided by expert judgments (ranging from 1 – worst quality, to 5 – best quality) with User-defined priorities assessed by means of pairwise comparisons among the criteria.

The five criteria adopted for GOWARE concern: **water protection functionality**, intended as the BMP effectiveness for the main adaptation target then in terms of protection of water resources and/or flood risk mitigation; **cost**, defined as a general BMP cost to performance ratio; **time necessary for the implementation** of the BMP; **robustness of BMP**, intended as the BMP resilience also to external further forcing not planned in design phase or perfectly recognizable; **multi-functionality**, intended as the BMP capability to address also further functions (e.g. better provisioning, climate regulation, recreational).

As usually carried out in literature, GOWARE incorporates techniques for checking the consistency of the decision maker's evaluations, thus trying to reduce the bias in the decision-making process. Specifically, the

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accuracy of the pairwise matrix is evaluated by means of the Consistency Ratio (Malczewski, 1999) and, according to Saaty (1980), a threshold is set to consider the comparison matrix consistent.

For selected BMPs, additional relevant details are provided to User; they include the main related EU legislation, pertained measures, e.g., in Water Framework Directive (Key Type of Measures), or Additional Project Measures identified within PROLINE-CE. Furthermore, relevant review papers, available data platforms and past European projects addressing the same topics are reported.

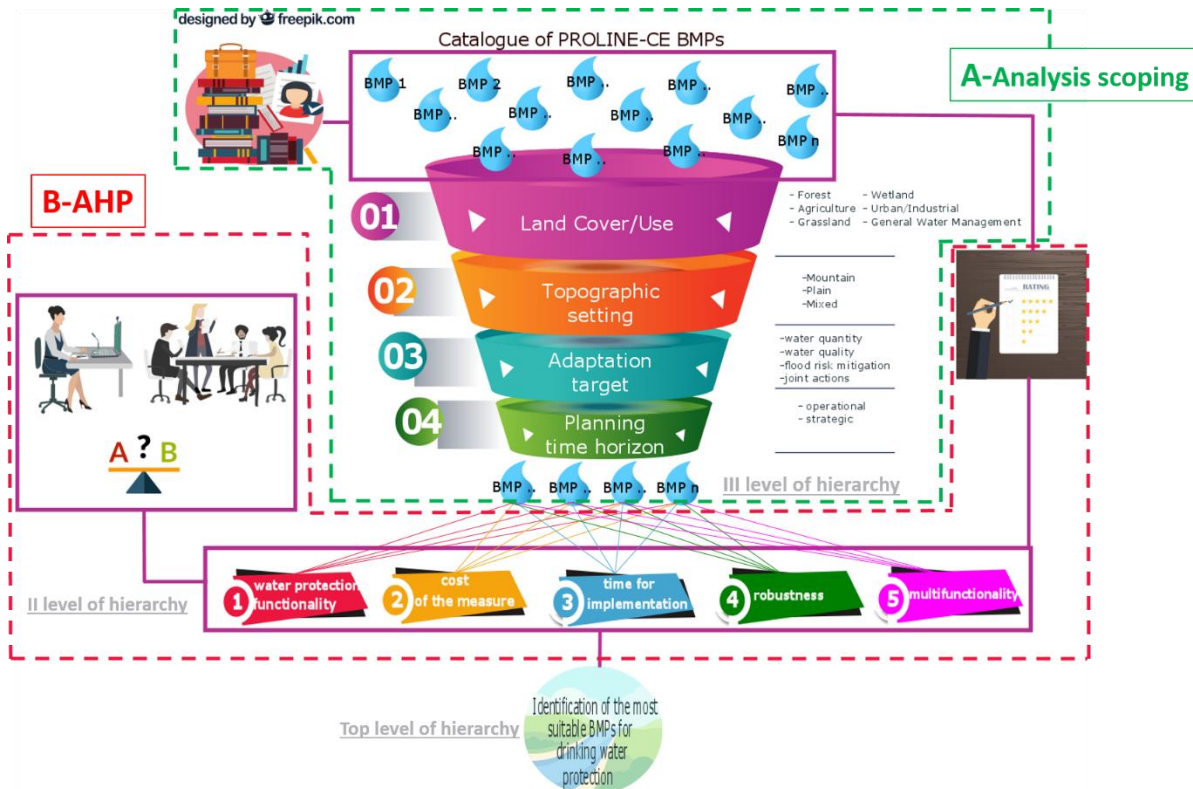


Figure 1 - Schematic representation of the GOWARE design. The context scoping and pre-selection of BMPs (first stage of the analysis) are shown in the green dashed box while the criteria ranking and BMPs prioritization (second stage of the analysis) are shown in the red dashed box.

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Keywords: Decision Support Tool, Best Management Practice, Analytic Hierarchy Process, pairwise comparison

THE WAY TO DRIFLU CHARTA

A COMMITMENT TOWARDS AN OPTIMIZED AND EFFECTIVE LAND USE MANAGEMENT FOR DRINKING WATER PROTECTION

Elisabeth GERHARDT¹

ABSTRACT

One of the main outputs of PROLINE-CE is the DriFLU Charta. The abbreviation “DriFLU” stands for “Drinking water/Floods/Land use” combining the most important thematic issues within this project.

Based on the main outcomes of the previous working steps within PROLINE-CE, a commonly agreed paper between all participating project partners was prepared. At the end of the project – during the Final Conference (Vienna, 4th June 2019) – the charta is signed by notable representatives of each country to determine the most important tasks towards an optimized and effective land use and flood/drought management with efficient organizational structures regarding drinking water protection.

For the charta, those gaps in actual management practices that were most commonly mentioned respectively the driving forces in each partner country and the relevant Best Management Practices (BMP) were selected according to the different categories of land use and vegetation cover (Forestry, Agriculture, Urban Areas, Transport/Industrial units, Energy production, grassland and wetland). Also the “general recommendations” were summarized containing mainly common water management related issues, derived partially from diverse stakeholder involvement processes on different levels (transnational and national/regional/local). To each of the gaps respectively BMPs the related “Adaptation of strategies/policies” were selected and supplemented or adapted according to the main results and findings of PROLINE-CE.

In order to ensure the usability of this Charta not only on transnational but also on national/regional/local level courses of action for BMP implementation in accordance with the DriFLU Charta were prepared for each participating country, enabling to focus more on national specific characteristics and problems.

As some of these BMPs and their operationalisation possibilities were tested and assessed within the pilot areas necessary steps towards adaptation, implementation and acceptance of each BMP were delineated for each pilot action containing also remaining issues to be solved.

Furthermore, the main results and findings of the 2nd stakeholder workshops, carried out in November and December 2019, especially recommendations made by the participants, were taken into consideration and supplemented within the relevant issues. Moreover, funding possibilities surveyed in each partner country were added to the respective BMP.

Following general recommendations were submitted during the different stakeholder involvements:

- *A better communication and dissemination of knowledge and experience* between decision-makers / legislators, experts and other stakeholders and for the improvement of the transfer of results (transnational and interdisciplinary experiences) to decision makers and authorities responsible for the implementation of European directives

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- Development of *efficient education systems for farmers* (at eye level! – calling attention also to economic benefits) and *public water management administrations* in cooperation with decision-makers, legislators, NGOs and research institutions (all affected stakeholders have to be involved and informed)
- *A change of human consciousness* of decision makers and all other stakeholders. Decision makers must directly stimulate good practices, and vice-versa, whereas other stakeholders should adapt and generally open their minds for changes in actual management practices.
- *Awareness raising* – drinking water protection provides not only benefits for water suppliers, but also for foresters, nature conservation, the economy and the general public
- Encourage the *adoption of PES* (Payments for the provision of Ecosystem Services) *schemes* for stakeholders (e.g. farmers), if the implemented measures (e.g. Best Management Practices of PROLINE-CE) go beyond the level of national/regional legal frame. These payments should be made transparent for all stakeholders to raise the awareness.
- Particular emphasis on the importance of *water governance* and the integration within water and land use related policies: Different plans addressed to several topics related to water highlight potential priorities, externalities, *synergies* (e.g. drinking water protection and flood mitigation) and conflicts, which have to be carefully considered in further implementation steps.
- *Application of hydrological/hydro-geological models on catchment level* to estimate impact of land use, provide reliable risk analysis, find efficient site-specific solutions and determine drinking water protection zones in spatial planning.
- *Best practice examples* should be spread around to other regions and affected stakeholders (e.g. water suppliers) and implemented through a network of stakeholders

The DriFLU Charta provides also important inputs for different EU guidelines and strategies, like especially EU Strategy for the Danube Region (EUSDR, Priority Area 4 & 5), EU Strategy for the Alpine Region (EUSALP, 3rd thematic policy area), EU Strategy for the Adriatic and Ionian Region (EUSAIR), EU Water Framework Directive, EU Floods Directive and EU Strategy on Adaptation to Climate Change. Providing an adequate link between the proposed measures within PROLINE-CE and the Key Type Measures (KTM) of the Water Framework Directive the respective numbers were listed in each BMP.

Keywords: drinking water protection, floods, land use management, best practice examples, joint signed declaration

GUIDANCE FOR THE DANUBE REGION FOR SUSTAINABLE LAND USE PLANNING

INTEGRATING LAND USE PLANNING INTO RIVER BASIN PLANNING AT TRANSNATIONAL LEVEL

Prof. Prvoslav Marjanović¹, Dragana Pejović¹ and Marko Marjanović¹

Water resources provide the lifeblood of natural systems, societies and economies. People have lived near and on rivers, lakes, wetlands and deltas for many centuries. Most early civilizations emerged on the banks of some of the world's iconic rivers. Rivers and groundwater provide a multitude of services such as water supply for farms and cities, waste disposal for factories and households, fisheries to provide food for communities, energy to drive economies, flood attenuation for downstream developments, cultural and recreational enjoyment for people, spiritual upliftment for believers and a habitat for many animals. It is precisely because water resources provide so many functions that planning for their use is so complex.

Water related land use planning in **transnational** context is one of the focus areas of CAMARO D Project. Transnational in this case refers to the Danube River Basin which is mostly on the territory of EU Member states or EU candidate countries. CAMARO-D Project is focused on land use planning and its role in achieving the EU Water Policy objectives as articulated through Water Framework Directive.

Spatial/Land use and planning essentially involves the development and implementation of strategies and procedures to regulate land use and development in an attempt to manage and balance the numerous pressures placed upon land and water.

GUIDANCE FOR THE DANUBE REGION FOR SUSTAINABLE LAND USE PLANNING provides a framework for linking land use planning and water management. In doing this, it is recognized that land use planning essentially involves the development and implementation of strategies and procedures to regulate land use and development in an attempt to manage and balance the numerous pressures placed upon water. In this context the following is recommended:

1. Transnational Land use planning procedures, amongst a range of other environmental planning and management strategies and techniques (e.g. economic instruments, demand management and pollution prevention and control), should be implemented to help to address challenges associated with water management.
2. Land use planning lies at the heart of addressing environmental problems and has a particularly important role to play where available water supplies are stretched, or where development is proposed in areas at risk of flooding.
3. Land use planning can now be seen as the starting point of sustainable management of water resources and the associated social and economic systems. Reconciling and coordinating competing demands should thus rely on appropriate planning mechanisms established to overcome and address water management challenges as per WFD requirements.
4. The process, content and extent of RBMP is set by the requirements of the WFD and water related land use plans should fit into this through integration into different stages of the RBMP development and especially within the context of the program of measures which every RBMP must contain.

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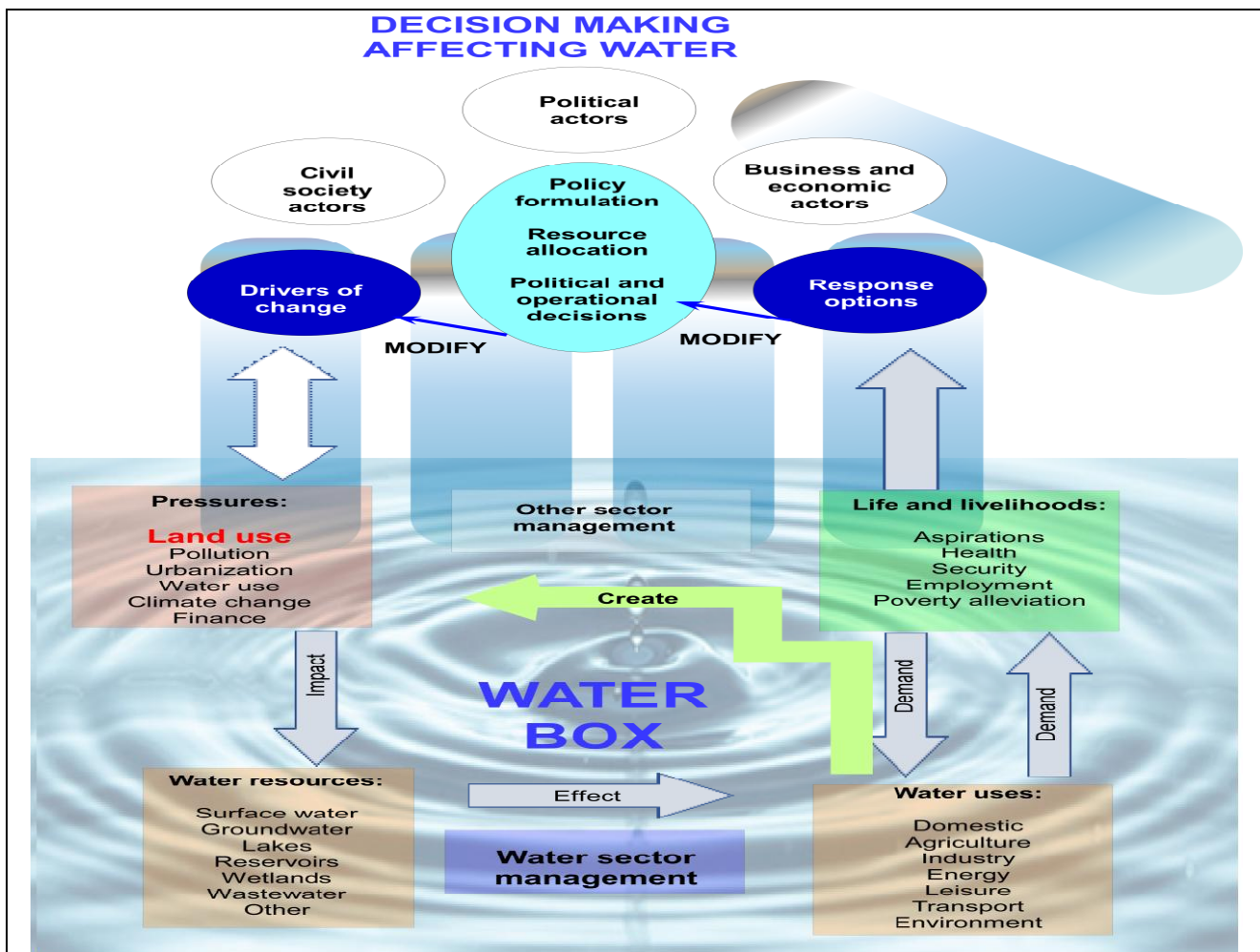
- Catalogue of measures and best practices based on experience is a valuable component of a toolbox available to water and land use planners and should be seen as significant resource for the RBMP process and definition of program of measures.
- Water related land use planning should focus on ecosystem services provided by different land uses in the context of WFD requirements. It is therefore imperative that evaluation of the role of ecosystem services in water management be considered as a part of land use planning within the RBMP process.

Land use planning can make an important contribution to the achievement of the legislative requirements of the WFD.

Land use planning procedures can contribute directly to some of the 'basic measures' which are minimum requirements for inclusion within RBMPs.

The GUIDR document provides specific guidance and recommendations on land use planning focused on different land use clusters: agriculture, forestry, grasslands and alpine pastures; focussing on standards for catchment based, function-oriented land use management and spatial planning, effective decision-making process and active participation of all stakeholders, trans-sector and transnational cooperation and implementation of best practices in existing strategies, policies etc.

The GUIDR provides the overall framework for integration of land use planning into transnational policy framework which is an integral part of the WFD.



Overall framework for integration of land use planning into transnational water policy and planning.

Keywords: Land use planning, River Basin Management Plan, Water Framework Directive, Toolbox

TRANSNATIONAL LAND USE DEVELOPMENT PLANNING (LUDP)

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The development of holistic land use planning for river catchment areas comprises a number of interdependencies between land use practices and water resources. These linkages are characterized through the effects of anthropogenic activities, such as land cover alterations and land degradation on ground water resources, water quantity and quality, surface run off and floods. Climate change causes additional adverse effects.

Within the CAMARO-D project a transnational catchment-based concept of land use planning (LUDP) in terms of sustainable protection of water resources and mitigation of flood risk is a result of the coordination and harmonization of different function-oriented sustainable land use management activities and planning instruments. It is recognised that watershed management is a dynamic and continually readjusting process which is continuous and needs a multidisciplinary and flexible approach. The methodology used identifies existing pressure on water resources and relates them to land use practices, management and policies. The variety of land use types and their interdependencies with water management determine the need for an innovative transferable concept of land use planning.

Through the transnational approach certain “risks” were identified in several countries of the Danube River Basin and the respective best practices were elaborated by the whole project consortium. Selected transnational best practices on how to solve existing conflicts between land use or vegetation cover and protection of water resources as well as flood prevention challenges in the countries of the Danube River Basin are linked to existing strategies and policies.

During the development of the concept of land use planning the collaboration with relevant stakeholders (local population, institutions and governmental authorities) is essential for an effective decision-making process. Stakeholder engagement is an integral part of good practice in modern policy-making, particularly in initial stages of policy development. An important step in the process of interaction with stakeholders is to provoke them into searching professional advice and to participate in different learning interactions (e.g. workshops and trainings) (Fig. 1).

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Fig. 1. Study visits and workshops carried out in Camaro-D pilot areas, © EFA, © AREC, © ROMSILVA

For the successful development of LUDP good governance for the effective coordination of different sectors and policy levels is required. Horizontal coordination of sectoral administrations and policies, vertical coordination of different levels of responsibilities and the active involvement of all relevant stakeholders is essential for the development of LUDP.

The successful steps for implementation of LUDP include a **preliminary study** of the responsible institutions, analysis of relevant coordination requirements of LUDP and communication with stakeholders in the planning area, estimation of costs and realistic time table; an **inventory** of existing data bases; the **definition of goals and objectives** based on an analysis of the most relevant / important existing risks and gaps (e.g. erosion, soil compaction, floods, water pollution, surface runoff, invasive plant species, groundwater recharge, surface and groundwater interaction) and a **concept of measures based on the selected best practices** coordinated with the responsible administrative bodies.

The role of land use planning in water management is a key stone for improvement of land use practices and serves as a strategic outline for sustainable protection of water resources and flood risk prevention in the Danube River Basin. CAMARO-D outcomes may serve as important inputs for the further development of EUSDR (EU Strategy for the Danube Region) and other relevant EU-policies like Water Framework Directive and Floods Directive as well as for the Danube River Basin Management Plans.

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Keywords: land use planning, best management practices, stakeholder involvement