Interreg
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PROLINE-CE

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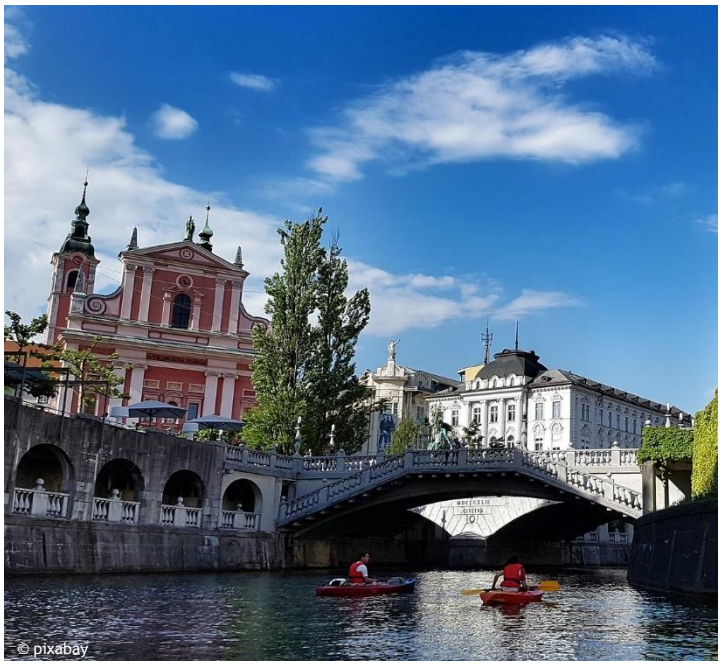
Stakeholder Dialogue & Round Table 1

June 12th, 2018

Ljubljana, Slovenia



Minutes:

- Agenda
- Discussion
- Pictures
- Feedback evaluation
- Abstracts
- Participant lists

TAKING COOPERATION FORWARD

REPUBLIC OF SLOVENIA
GOVERNMENT OFFICE FOR DEVELOPMENT
AND EUROPEAN COHESION POLICY

Interreg CENTRAL EUROPE
European Union European Regional Development Fund
PROLINE-CE

PROGRAMME
Stakeholder Dialogue & Round Table 1
June 12th 2018, Ljubljana, Slovenia

14:00 – 14:30	**Session 1**
Presentations	Preliminary work for GOWARE *Guido Rianna (Euro-Mediterranean Centre on Climate Change Foundation, IT)*
	Draft DriFLU report *Elisabeth Gerhardt (Federal Research and Training Centre for Forests, Natural Hazards and Landscape, Vienna, AT)*
	Discussion
14:30 – 15:10 national	**Session 2** Still existing shortcomings and challenges and arrangements for DriFLU Charta
Presentations	**Agriculture:** Irrigation as a sustainable land use management measure in drinking water protection areas *Marina Pintar (University of Ljubljana, Biotechnical faculty, Ljubljana, SI)*
	Water management: Cost-effectiveness of woodland measures to improve water quality: aspirations, activities and initial findings of the PESFOR-W COST Action *Gregory Valatin (PESFOR-W Forest Research, Surrey, GB)*
	Opening the black box of spring water microbiology to support proactive drinking water resource management *Georg Reischer (Interuniversity Cooperation Centre Water & Health, Technical University Vienna, AT)*
	Forest Management: Importance of forest site mapping for drinking water protection *Alexander Mrkvicka (Forest Department of the City of Vienna, AT)*
	Discussion
15:10 – 15:30	Coffee Break
15:30 – 17:00	**Workshop:** **Feed-back loops for GOWARE and DriFLU Charta according to applicability in different fields of actions (agriculture, forestry, water management)**
Moderation	*Stefan Kollarits, PRISMA solutions, Mödling, AT*

Discussion

After the presentations, it is clear that with PROLINE-CE instruments a political commitment should be achieved in a very broad and complex field. But what are the most important problems and what should the project focus on?

Therefore it is important to know the stakeholders' point of view: what, in their working environments, are the requirements for the PROLINE-CE tools; what should be considered to be accepted on a political level and thus become available as a guideline or regulation:

Input auditory:
Land-use causes costs and benefits. Concerning the **payment for environmental services,** we should look: who benefits and who pays the costs? E.g: the costs have to taken by the whole society – how could this be distributed to everybody. It is true, however, that a lot of changes would be necessary to distribute the costs equally
Another problem: measuring, monitoring, data-collection: to come to short conclusions year long work is necessary, so it's not so easy. This has to be pointed out.

Mrs. Pintar points out that in Slovenia, for agriculture, this is covered by subsidies; there is a group of measures for which farmers can apply, which are dedicated to improve the environment. So ecological production, use less fertilizers,… at least for some things the system of subsidies could be an answer.

Gregory Valatin remarks that this is a fundamental question for all incentive schemes, questions of fairness need to be considered; there are many national approaches;
It could be an aim of PROLINE-CE to raise awareness about those issues: the fact that the system of subsidies is not transparent; what is good practise, what is compensation for additional efforts which others don't have; often this is not transparent, often it is a political struggle (farmers, water consumers, …).

On the other hand, in the next 1- 1 1/2 years, concerning common agricultural policy, there will be new regulations concerning subsidies in the EU and it would be interesting to give input with DirFlu charta in the right correction of this. According to Mrs. Pintar, it will be much more on a national level to decide. This is why in the projects, it is time to turn to national authorities, to start conversation with them, e.g. ministries.

Discussion

Moderator:
How could we proceed in order to be a player to drive the process in a certain direction, to open the right doors in order to convince people ? Is PROLINE-CE capable of doing that?

Input auditory:
In PROLINE-CE, we are talking about the guidelines BEFORE implementing something: subsidies that exist and are related to agriculture are not always linked to nature conservation or water protection; in Bavaria, e.g. there are 2 different Ministries concerned → there is a subsidy related to different land-use measures, but it's not directly linked to water protection; so talking about subsidies means also talking about political structures; so EU-wide legislation: we have to get a link between agriculture and water protection!
Authorities have to work closer together, there are too many interferences → we should try to balance the different interest by finding common interests. Actually good drinking water IS a common interest, but often project lack social skills resp. marketing skills – how do you sell this idea?

So one of the most important goals is to persuade the different actors to collaborate, to see it in an integrated way, the project should come up with measures which provide synergies! The technical knowledge hast to be transferred into arguments which need to be marketed;
From the stakeholder's point of view, e.g. in Slovenia, farmers would like to see more measures tailored to their circumstances.

For the project, water utilities are a main target group: for drinking water protection and flood mitigation, measures could be promoted that combine both;

- the goal would be first of all water utilities, but then also other institutions who could make use of it.
- Furthermore, key stakeholders have to be identified which support us in marketing measures, to push the ideas that were created.

PROGRAMME
Stakeholder Dialogue & Round Table 1
June 12th 2018, Ljubljana, Slovenia

Moderated discussion

Around 50 people participated

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 85% ticked 5 or 4, concerning the quality of the event. A total of 27 questionnaires was filled in.

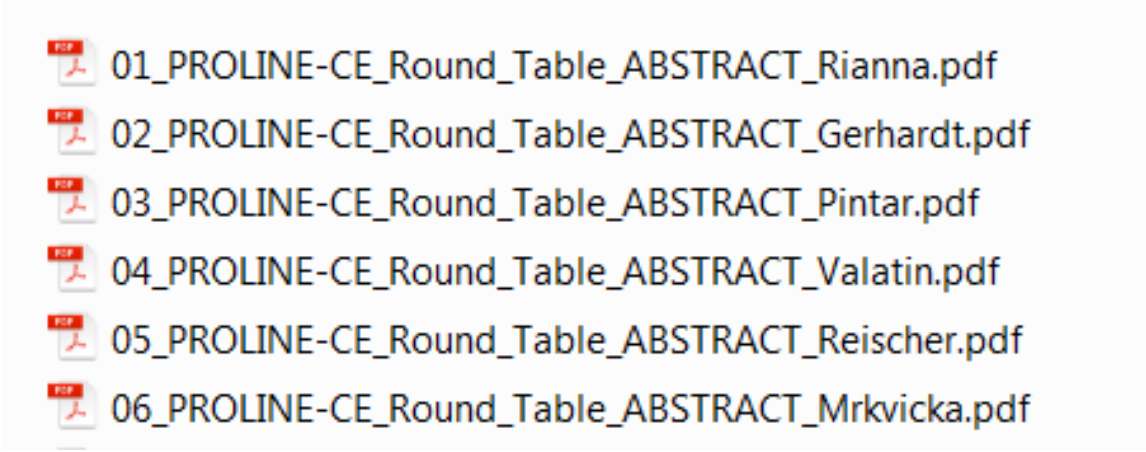
Evaluation:

PROLINE-CE Round Table 01 (12.06.18, Ljubljana) Feedback Questionnaire

	Value 1	Value 2	Value 3	Value 4	Value 5	n.a.
Total number:	0	3	52	150	169	4
Percent	0%	1%	14%	40%	45%	1%

ANNEX

Abstracts for Round table 01
Participant list



WP3 "SYNOPSIS: VISION AND GUIDANCE"

HYDROLOGIC ECOSYSTEM SERVICES AS KEY STRATEGY FOR DRINKING WATER PROTECTION AND MITIGATION OF HYDROLOGICAL HAZARDS

Guido Rianna[1]

Ecosystem services, defined as "the benefits people obtain from ecosystems" (MA, 2005) received increasing interest after Millennium Ecosystem Assessment (MA) (2005), the former international effort to emphasize and promote the role and significance of ecosystems for human well-being.
In this perspective, all the different frameworks proposed to categorise and describe ecosystem services (e.g. MA,2005; TEEB, 2010; Haines-Young and Potschin, 2018) clearly recognizes *hydrologic ecosystem services* as the benefits to people produced by terrestrial ecosystem effects on freshwater. The pivotal reviews carried out by Brauman (2007; 2015) identify, to this aim, the four main "attributes": quantity, quality, location and timing (Figure 1) in which water resources can be influenced by different ecosystems and the associated services (Figure 2)

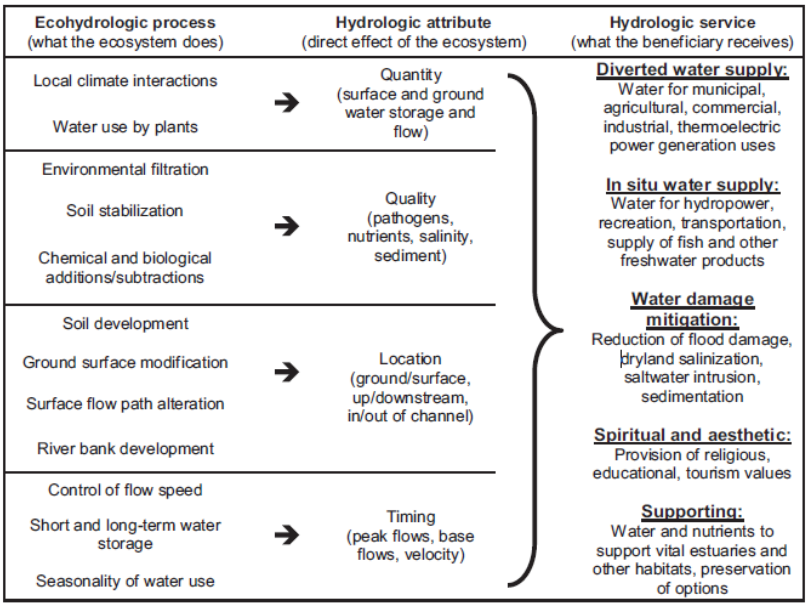


Figure 1 Relationship of hydrologic ecosystem processes to hydrologic services

On these grounds, WP3 is aimed to foster and develop measures and practices properly supporting drinking water protection and reducing, at the same time, the occurrence and magnitude of water-related disasters detecting an adequate trade-off between the two objectives.
To this end, desk review and expertise of different Project Partners will permit identifying the most suitable possibilities for funding ecosystems services (e.g. REDD+, Reducing emissions from deforestation and forest degradation Program) at national and transnational level. At the same time, it could entail mainstreaming the "Ecosystem services" concept into sectoral and horizontal policies enhancing the coherence among the different tools (e.g. biodiversity, climate changes, water security).
These efforts will permit achieving several key products:
- elaboration of a transnational, but tailored at national scale, plan for land-use management and its variation addressing, in effective way, drinking water protection and water related disasters induced by water excess or shortage (flood and droughts)

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- definition of recommendations properly targeted for operational (e.g. water suppliers) and spatial planning and management purposes (e.g. Municipalities or Regional Authorities) promoting a sustainable and safe utilisation of water resources.

All the findings and the developed approaches will then systematized CE Transnational Guide towards Optimal WAter REgime (GOWARE) conceived as the tool supporting project partners in preparing adequate information transfer to stakeholders and providing a plan for implementation of sustainable land use management in participating regions beyond lifetime.

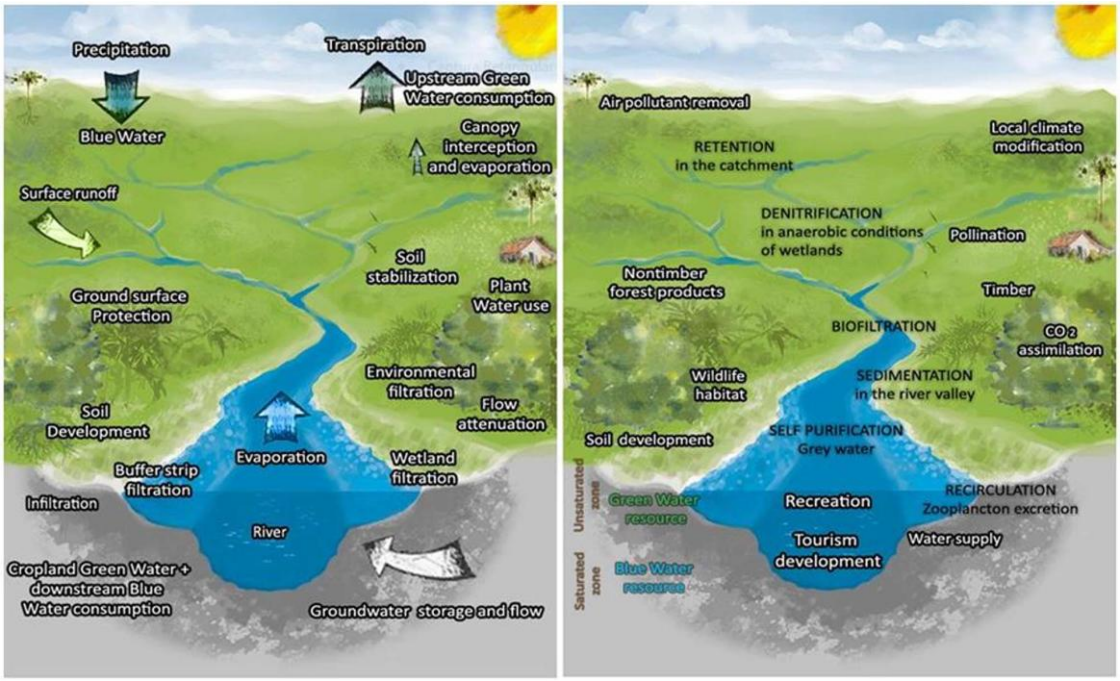

Figure 2: Ecohydrological flows and ecosystem services into a catchment. Left side: Conceptual diagram highlighting three main flows (precipitation, evapotranspiration and surface runoff) in the hydrological cycle. Right side: hydrologic services framework showing how ecohydrologic flows impact the ways people can use water at the catchment scale [from Taffarello et al., 2017]

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Keywords: ecosystem services, hydrological services, policies, water resources, hydrological hazards

DRAFT DriFLU REPORT

NECESSARY INPUTS AND ROADMAP OF DriFLU CHARTA

Elisabeth Gerhardt[1]

ABSTRACT

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

This joint declaration act will contain transnational guidelines regarding an efficient protection of drinking water resources. This objective should be achieved through the development of sustainable and appropriate land use and management measures aiming at the protection of drinking water resources and additionally at the mitigation as well as reduction of droughts and floods influencing these resources, under the challenges of climate change.

Based on the main outcomes of the previous working steps within PROLINE-CE a common agreed paper between all participating project partners will be prepared and at the end of the project – during the Final Conference - 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.

To ensure the usability of this Charta on national/regional/local level as well as on transnational level an adequate intensive stakeholder involvement (2nd series of national stakeholder operationalisation workshops, 2 Round Tables) is envisaged resulting in additional DriFLU Chartas on the level of each participating country to have the possibility to focus more on national specific characteristics and problems.

As the Declaration Act will be signed by all participating countries the targets have to be defined and formulated in a more general way to guarantee the applicability to addressees and areas also outside the programme area. It should be a joint declaration act to bundle efforts towards an integrated land use and flood/drought management connected to drinking water protection.

Therefore the transnational DriFLU Charta will be just a very understandable, focused and short paper with the main necessary measures concerning the different land uses: forestry, agriculture, urban, grassland, wetland and general recommendations. Within an Annex these mentioned issues will be explained more in detail to be as precise as possible.

Furthermore as the DriFLU Charta should not be only a paper, which will be signed, but also a document which should be implemented in each participating country it is important to create this Charta also related to the national specific issues, which can differ more or less between the PROLINE-CE countries. To guarantee a quite target-oriented document embedding relevant topics in national/regional strategies and policies, participatory processes with respective stakeholders will be conducted.

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The thematic basis for the DriFLU Charta will be on the one hand the outcomes of the previous work packages (WP T1 – 3) and on the other hand some relevant drinking water protection issues of international documents [e.g. United Nations World Water Development Report (WWAP); Natural Water Retention Measures (NWRM)-project; Sustainable Drainage Systems (SuDS)-Manual].

Finally DriFLU Charta will provide important contributions to EU-relevant documents, like EUSDR, EUSALP, EU 2020 Strategy, 2030 Agenda for Sustainable Development (mainly to the Sustainable Development Goal SDG 6), EU Strategy on Adaptation to Climate Change, EU Water Framework Directive (River Basin Management Plan 2021-2027) and EU Floods Directive.

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NWRM (Natural Water Retention Measures): 53 NWRM illustrated, NWRM-project (http://www.nwrm.eu)

The SuDS (Sustainable drainage systems) Manual. 2015. London, CIRIA

Keywords: PROLINE-CE, drinking water protection, land use management, joint signed declaration act

IRRIGATION AS A SUSTAINABLE LAND USE MANAGEMENT MEASURE IN DRINKING WATER PROTECTION AREAS

Marina PINTAR[1]

Fertile river plains in Slovenia have ideal conditions for agricultural production. But the question arises how agriculture affects the quality of groundwater that is intended for drinking water supply. Two important ecosystem services are covered in the same area: namely food production and clean fresh water provisioning (Glavan et al., 2015).

In the research on the Drava River plain in Slovenia has been determined how changes in the management of agricultural land (cultivation technics, fertilisation, type of crop, crop rotation) influence on the leaching of nitrogen from the soil profile. Different scenarios of potential agricultural land management have been created to run Soil and Water Assessment Tool (SWAT) model. The most drastic effect on the increase of nitrogen leaching showed vegetable production technology, followed by cereals. Effects of grassland production may lead to 76 to 98 % reduction in nitrogen loss from soil profile in comparison to current practices (Glavan et al., 2015).

In 2011, the National Assembly of the Republic of Slovenia (hereinafter: the Assembly) adopted a Resolution on the strategic orientations for the development of Slovenian agriculture and food industry until 2020 - Zagotovimo.si hrano za jutri, where are set out the following strategic objectives for the development of agriculture and food production:
- ensuring food security through the stable production of safe, high-quality and affordable food,
- increasing the competitiveness of agriculture and food,
- sustainable use of production potentials and provision of agriculture and related public goods and
- ensuring coherent and socially sustainable rural development (in cooperation with other policies).

Irrigation is an effective measure to increase food security. Based on the Resolution, in 2017, the Assembly adopted Irrigation and Water Use Plan for Irrigation in Agriculture in the Republic of Slovenia until 2023 and the Program of Measures for the Implementation of the Irrigation and Plan for Irrigation in the Republic of Slovenia until 2023 (Načrt…, 2017).

In Slovenia we have now 10.723 ha (or 2.3 % of agricultural land in use) of irrigation systems and additional 2815 ha are planned by 2023 (Načrt…, 2017) with the aim of ensuring food security with the stable production of safe, high-quality and consumer-accessible food. There are 221,355 ha (10.29 % of agricultural land) potentially suitable for irrigation (Pintar et al., 2012) in Slovenia, among which 42,367 ha or 19 % of all agricultural land suitable for irrigation is in the water protection areas. Arable land covers 90 % of this area (Načrt…, 2017).

The frequent occurrence of droughts resulting from climate change has a major impact on agriculture, whose primary task is to ensure adequate supply of food to the population, but in doing so, also carry out an environmental function that is to maintain the quality of water, soil, air and biodiversity. That is why irrigation systems should be planned particular carefully in water protection areas. Increased nitrate concentration in groundwater is mostly caused by the application of mineral and organic fertilizers. It is necessary to emphasize that proper irrigation reduces the adverse impact on the quality of underground water (the risk of contamination of groundwater with pollution from agriculture).

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In drought years, groundwater is usually more polluted. Plants are always fertilized in advance (only with drip irrigation the plant can be provided with nutrients continuously). Plants can accept nutrients only in dissolved form by the roots, so fertilizers must dissolve in soil water. We need to take care of the proper water regime in the soil. Reliance on rain is not always successful. There could be no rain or it could be more precipitation than the soil can hold it. Then water with dissolved nutrients flows into groundwater what causes pollution. If only as much water is added as can be retained in the soil, what is the basic rule of proper irrigation, the nutrients dissolve, but remain in the soil profile available for the plants uptake. During possible rainy event later on that would cause the water to flow through the soil profile to the groundwater, this water contains less nutrient residues as in non-irrigated case.

Maintaining the active role of the root system supporting the green cover prevents the leaching of nitrate into the groundwater. Where irrigation is applied, the root system is more developed and plants more efficiently exploit the available nutrients. Technological solutions allow also applying liquid fertilizers by drip irrigation system - fertigation and thus more successful exploitation of nutrients by plants. We also can connect irrigation with a more appropriate way of fertilizing plants. The results from research on Ljubljansko polje (Slovenia) confirm that fertigation and improved irrigation scheduling can be an effective way of minimizing nitrate leaching, and should be considered for vegetable production in or close to groundwater protection zones (Zupanc et al., 2011).

To provide farmers with relevant information and expertise for proper irrigation and to establish Decision Support System for Irrigation as a support tool for farmers, several projects are underway in Slovenia (e. g. LIFE ViVaCCadapt, TriN, URAVIVO).

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URAVIVO: http://www.bf.uni-lj.si/index.php?eID=dumpFile&t=f&f=30758&token=4992cf493603f169d60665cf8eee3d756ba777ba

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KEYWORDS: nitrate leaching, proper irrigation

COST-EFFECTIVENESS OF WOODLAND MEASURES TO IMPROVE WATER QUALITY

ASPIRATIONS, ACTIVITIES AND INITIAL FINDINGS OF THE PESFOR-W COST ACTION

GREGORY VALATIN[1]

WOODLANDS FOR WATER PES

The EU Water Framework Directive aims to restore Europe's water bodies to "Good Ecological Status" by 2027, but many Member States are struggling to achieve this, partly due to diffuse pollution - which poses long-term chronic risks for over a third of European freshwater bodies. Meeting WFD targets in a cost-effective way will require mainstreaming incentives such as Payment for Ecosystem Services (PES) schemes to deliver effective, spatially-targeted actions.

The PESFOR-W COST Action (CA15206) is synthesizing knowledge on existing PES schemes involving woodland creation to improve water quality, including information on their *Environmental Effectiveness*, *Cost-Effectiveness*, and *Design and Governance* to provide guidance for future development of new PES schemes. Drawing on a literature review of existing approaches (Accastello, 2018), the Action plans to develop a common conceptual framework and protocol to assess the cost-effectiveness for woodlands for water PES schemes. Issues to be considered include additionality, leakage, time horizon and discounting, opportunity and transactions costs, co-benefits, multiple objectives, different perspectives (buyer vs seller and societal vs financial), uncertainty, and absolute and relative concepts. It is anticipated that the agreed framework will be outlined in a presentation at the Ecosystem Services Partnership Conference 2018 session B3 - Forests for Water: Scientific evidence and economic mechanisms for encouraging ecosystem service provision.

PESFOR-W focuses on water quality in relation to 5 main categories of diffuse pollutants: (i) Nitrates; (ii) Phosphates; (iii) Pesticides; (iv) Fecal Indicator Organisms; and (v) sediment. In estimating cost-effectiveness, quantifying the effects of woodlands in reducing delivery of agricultural diffuse pollutants to watercourses is a fundamental initial step. A review of published evidence on their effectiveness (Pérez Silos, 2017) found, for example, that woodlands buffers reduce nitrate concentrations by over 70% on average in oceanic climates and by over 80% in Continental climates, with the strength of the effect strongly related to the width of the buffer. Potential for creating a Woodland Water Code to help underpin woodlands for water projects, along similar lines to the Woodland Carbon Code developed for the carbon benefits of woodland creation projects in the UK is to be explored (Valatin and Nisbet, 2017).

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[1] GREGORY VALATIN, FOREST RESEARCH, ALICE HOLT LODGE, FARNHAM, SURREY GU10 4LH, ENGLAND (email: gregory.valatin@forestry.gov.uk)

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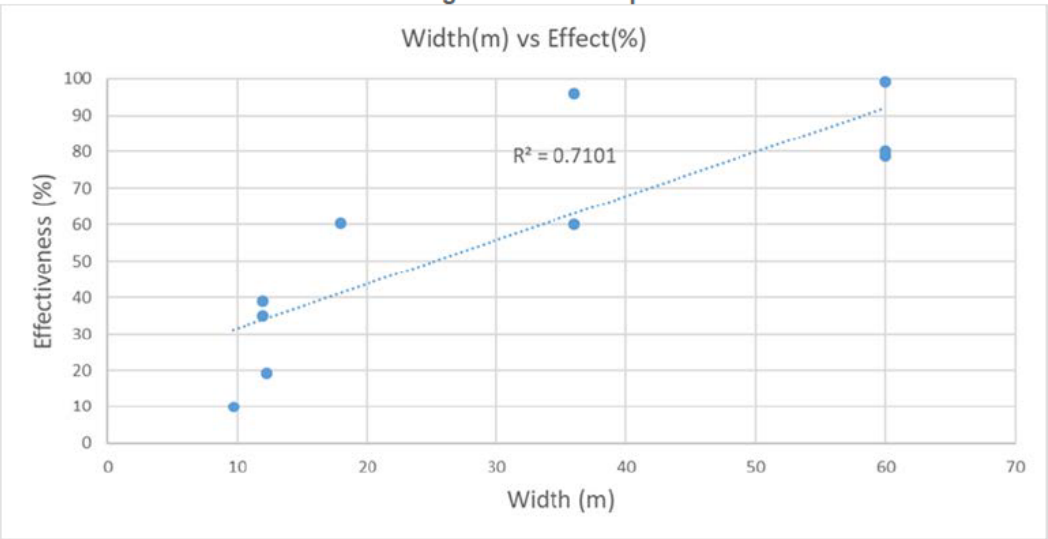
Keywords: cost-effectiveness, woodlands, water quality, diffuse pollution, payments for ecosystem services

NITRATE- NO_3-N

Concentration of NO_3-N (mg/l) in surface runoff

Climate	n	max[Initial]	min[Initial]	Av. Effect.(%)	Q1	Q2	Q3	Type of plantation/forest	n	Av. Effect.(%)
Continental	17	46.8	0.4	84.8 [18.4 - 100.0]	82	98	99	Hillside woodland	6	88.6 [64.0 - 100.0]
								Riparian woodland	9	79.8 [18.4 - 99.9]
								Shrub	2	96.0 [94.0 - 98.0]
Oceanic	8	32.5	0.1	74.2 [32.0 - 98.0]	60	77	95	Riparian woodland	7	73.9 [32.0 - 98.0]
								Shrub	1	76.0
Subtropical humid	13	13.5	1.3	82.5 [35.0 - 99.0]	80	92	96	Riparian woodland	10	89.7 [39.0 - 100.0]
								Shrub	3	58.3 [35.0 - 80.0]

Plot of results from studies assessing the effect of riparian and hillside woodland width



Source: Pérez Silos (2017, p.5).

OPENING THE BLACK BOX OF SPRING WATER MICROBIOLOGY TO SUPPORT PROACTIVE DRINKING WATER RESOURCE MANAGEMENT

Georg H. Reischer[1] Alexander K.T. Kirschner[2], Alfred P. Blaschke[3], Regina Sommer[4], Hermann Stadler[5], Andreas H. Farnleitner[67]

ABSTRACT

Standard as well as novel approaches for microbial faecal pollution diagnostics, such as ISO methods, molecular source tracking, near-real-time monitoring, and hazard- and risk assessment, can be efficiently combined for sustainable microbial drinking water resources management at alpine karst catchments with complex and hardly accessible structures, trans-boundary drainage systems and quick reaction time. The temporal resolution of the applied complementary methodology ranges from seconds to years and allows decision support at the appropriate time scale. The suggested framework is also of interest for other water resources, as the selected parameter and methods can be adapted to the respective situation or requirements.

Fig. 1. A framework for integrated faecal pollution analysis and management. Note that any of the 3 steps of analysis have importance for catchment protection and spring water quality management.
(MST = microbial source tracking, QMRA = quantitative microbial risk assessment)

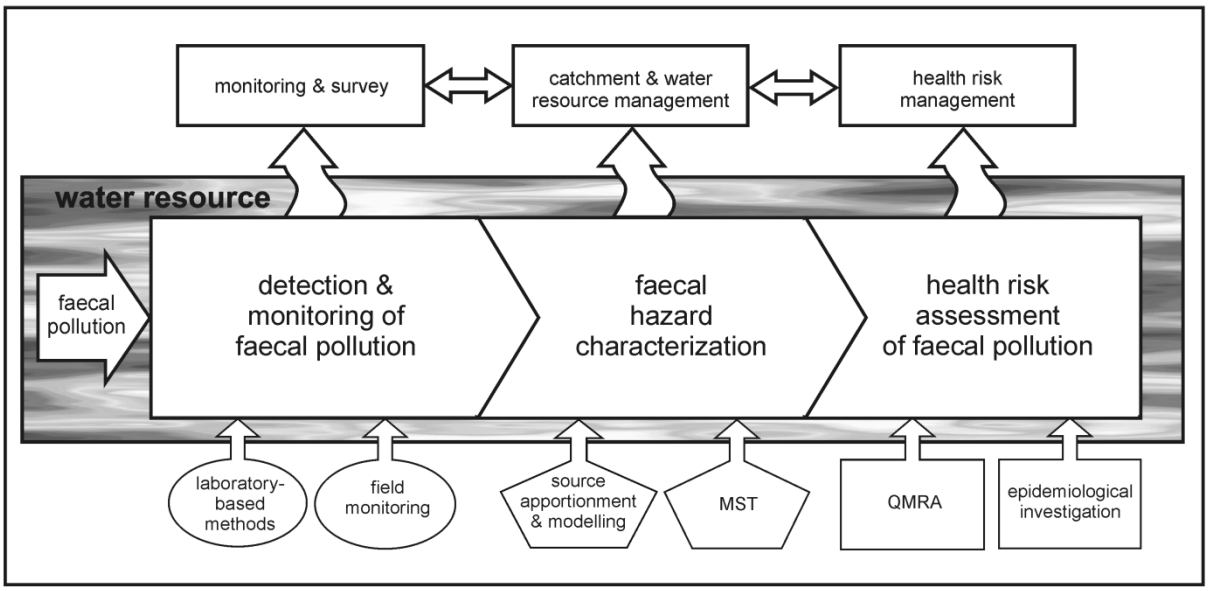


Table 1. Overview on applied "tools" for advanced faecal pollution analysis and management (note that the temporal resolution ranges over several orders of magnitude)**.**

name of method	principle	target	time scale
catchment survey	estimating emissions	indicators/markers	weeks - **months - years**
faecal source tracking	source determination	genetic markers	weeks - **months - years**
basic monitoring	standard procedures	standard indicators	**weeks - months** - years
event analysis	automated sampling	depending	**hours - days** - weeks
real-time monitoring	"proxy" parameter	depending	**seconds - minutes** - hours

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Keywords: microbial faecal pollution, molecular source tracking, hazard- and risk assessment, catchment management, karstic drinking water resources

FOREST SITE MAPPING IN THE WATERSHED FORESTS OF VIENNA

A. Mrkvicka [1]

Since the end of the 19 th century the City of Vienna bought watershed forests in Lower Austria und Styria, today ca. 33.000 ha.

Optimal conditions of habitats, soil and vegetation are essential for the quantity and quality of drinking water. Historic clear cuts and planted spruce forest in parts of the area led to low stability due to insects and storms.

In the 1980´s forest site mapping was implemented as an important instrument for planning sustainable landuse. From 1990 to 2001 mapping of the submontane - subalpine parts of the Schneeberg-Rax- und Hochschwab-Area was carreid out with 4 teams. Based on aerial photos (infrared) vegetation and soil were recorded and each vegetation/forest unit documented with releves. These data were used for the GIS-based production of maps (soil, water, actual and potential vegetation).

Together with the project „Hochlagenkartierung“ (combination of site mapping, interpretation of aerial infrared photos and GIS-modelling of alpine vegetation) information about vegetation and soil exists for ca. 33.000 ha water protection areas as base for planning and management.

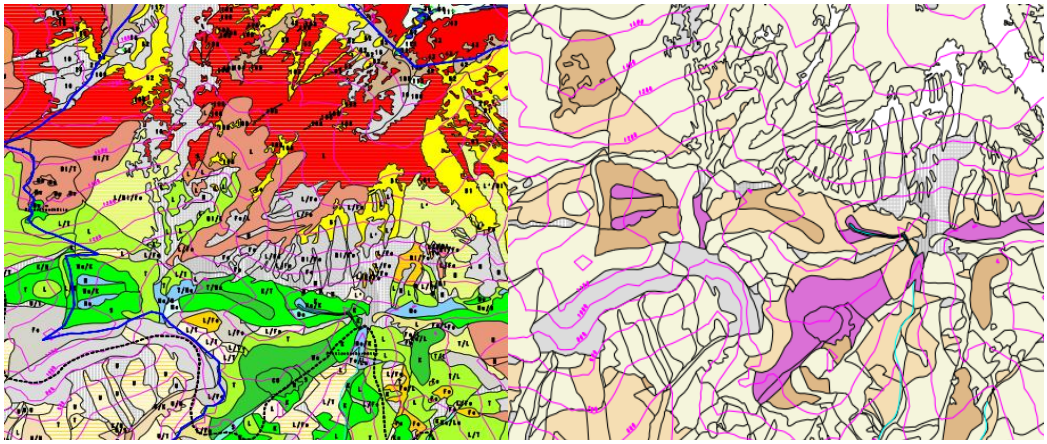

Fig.1.: Vegetation and soil type map of the southern slopes of Mt. Schneeberg (Lower Austria)

Forest site mapping is an important base for planning and management for forestry and management of alpine vegetation in the catchment areas, for nature conservation, tourism and infrastructure and Management of wild animals and alpine pastures.

It gives objectives for forestry / forest management based on PNV, soil type and susceptibility to storm, insects, erosion. It allows modeling impacts of climate change on forests, alpine habitats, groundwater and water quality.

It was very helpful with the Evaluation of proposed NATURA 2000 areas and a valuable basis for N2000 management-plans, programs for rare and endangered tree species and management of bear and wood grouse habitats.

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Site mapping and hydrogeological data are a valuable base for planning and management of touristic infrastructure, especially concerning historic touristic infrastructure on the mountains Schneeberg, Rax and Hochschwab which are visited by many tourists. It can help to prevent negative influence of touristic projects on habitats and water quality.

Especially deciduous trees and fir are important for the stability of forests. Therefore the knowledge on potential natural forest vegetation helps to ensure adequate natural rejuvenation of the forests through management of chamois and red deer. Site mapping is also important for wildlife ecological spatial planning and cooperation with landowners / hunters in adjacent areas.

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Keywords: watershed forest, forest site mapping, Vienna,

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